



A Statistical Case Study for the Components of Spiritual and Charismatic Leadership in Reverse Engineering based on Voice of Customer in Iran Khodro Company

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ABSTRACT

Nowadays, vending is the most important pillar of a production set. The positive and significant points of the manufactured parts are attained by interviewing with the customer, sending a questionnaire to the customer, testing the market, investigating the quality and reliability of new products, probing the reports and product quality of competitors. Aimed at predicting the type of leadership in reverse engineering, based on "Voice of Customer" (VOC), between the Iran Khodro Company's (IKC) managers (case study of Peugeot 405 brake pump shell), the present study was conducted. Using descriptive-correlation research method, about 90 managers were randomly selected in several categories according to gender, age and years of service, proportional to the size of each category. Three questionnaires of "Oregon and Kanowski Organizational Citizenship Behavior" (OKOCB), "Fry Spiritual Leadership" (FSL), and researcher-made "Charismatic Leadership" (CL) were utilized to collect the research data. To measure the reliability rate using Cronbach's alpha coefficient, this item was obtained for all three questionnaires of the OKOCB, FSL and CL behavior ($\alpha = 0.92, 0.81$ and 0.85) respectively. Collecting the data, they were analyzed using multiple regression analysis and based on the research hypotheses. The results indicated that there is a positive and significant relationship between the dimensions of SL and organizational citizenship behavior, and also between the CL and the organizational citizenship behavior. The results of structural equation modeling also showed that SL with a path coefficient 0.7 is able to affect overall quality management ($t \geq 1.96, p \leq 0.05$).

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INTRODUCTION

Today's world is the field of competition between organizations, environmental change, and technology [1]. Answering some questions such as how and when a sample is made and available as a resource is the main purpose of production planning [2]. The task of a production planner is to provide different processes for all production parts according to the available resources and objectives of the production. Objectives, limitations, and resources are the three main factors in production planning [3, 4]. An adroit planner must be able to figure out, administer and exert these components. Determining

both the production time and cost directly affects the production efficiency [5]. Poor planning wastes time, causes defective parts to be multiplied, and so on. In research and development (R&D), the ones in charge of planning the production process are usually chosen from proficient people and pay a lot of attention to these cases. During this process, the designer spends a great deal of time writing literature and similar items [6, 7].

Human being is the most valuable resource and a significant factor in achieving the organizational goals, but most managers ignore its impress and magnitude since they suppose that the required human resources are permanently at hand. In the meanwhile, organizations are

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nowadays facing drastic environmental conversions and evolutions and just a specialized and creative labor force can afford the means of life preservation and organizational progress in the current turbulent biosphere [8]. The completely changing organizations, prevailing conditions, the rise of competition, and the need for effectiveness in such conditions reveal the necessity of a valuable generation of employees. Referred to as organizational soldiers, this generation is undoubtedly the distinguishing feature of effective organizations from ineffective ones, because they consider the organization as their homeland and have no expectation of achieving its goals [9]. They do operate beyond their official duties and do not give up any effort [10].

Today, these extravagant and useful efforts are called organizational citizenship behaviors in organizational science and management literature. Civic citizenship behavior is a set of behaviors that are not part of the formal requirements of the organization or the job but contribute to the effectiveness of the work and the organization. It is often witnessed as a voluntary matter by employees [6, 10]. Therefore, it cannot be formally recognized. This definition of organizational citizenship behavior expresses the fact that these behaviors have a special impact on the organization's effectiveness by adding a social framework to the work environment. There are several reasons to explain why organizational citizenship behavior has such a great influence on the organization's effectiveness. There are some goals, namely boosting managerial productivity, reducing the need for scarce resource expansion, and creating an environment that intensifies the employee's morale [8, 9].

Regarding social changes, leadership is essential in the management of society. Therefore, when organizations face a globally competitive environment today, they always feel the need for radical changes and creativity, and in order not to drop behind, they often turn their attention to the leaders. With special courage, bravery and tact, they are trying to make fundamental changes within the organization [11]. A charismatic leadership (CL) is said to be a form of leadership that has the power to inspire the followers so that the abilities originate only from the personality strength and individual's commitment. This type of leadership is based on no financial reward or coercion [12]. To this end, the leader's opportunism requires some extent of information that can be obtained from a variety of sources – such as analyzing the data, reports, notes, meetings, etc.; discovered opportunities and issues; a better understanding of external events; and internal processes of discovered organizational units [10, 11]. Using three approaches, the CL modeling performs this role. First, the commitment to the vision should be demonstrated to the followers. Second, the beliefs, values and behaviors that are necessary to realize the vision of the organization are emphasized. Third, an indirect empowerment experience should be provided to the followers. That is, the followers

become empowered by observing the leader's simulated behaviors [13].

The spiritual leadership (SL) means creating and realizing the vision and alignment of values beyond strategic leadership. A spiritual leader recognizes the values, confers the required and sufficient knowledge or awareness on his followers, and goes on as far as asking them to take the lead over the others. Looking to the future, he decides consciously as well and responds positively to his calls [14].

Elbaz and Haddoud [15] have investigated the intervening role of micro-leadership in the relationship between leadership styles and staff team performance in the field of travel agencies. Relying on leadership theory and strategic leadership model, they create an integrated model that examines the relationships between four distinct leadership styles and their impact on employee satisfaction and team performance through the role of a wise leadership mediator. For the first time, Hornyak et al [16] studied a report on the joint design and implementation of a youth leadership framework in a national non-profit youth cancer organization. Staff and youth were surveyed to create a framework that includes a leadership model, a set of age-appropriate leadership development programs. This framework enables the organization to achieve its long-standing goals of supporting, developing and empowering young leaders. Safaeian et al. [17] as a case study in Iran, were evaluated based on the global standard for project management body of knowledge (PMBOK) and related literature. They to address the complexity of the proposed model, new meta-heuristic algorithms such as ant lion optimizer (ALO), dragonfly algorithm (DA), grasshopper optimisation algorithm (GOA), harris hawks optimization (HHO), multifaceted flame optimization algorithm (MFVO), sine cosine algorithm (SCA), salp swarm algorithm (SSA), whale optimization algorithm (WOA) and gray wolf optimizer (GWO) were proposed. Gheibi et al. [18] investigated the environmental consequences and the long-term epidemiologic results of noise pollution in the city of Mashhad. All measurements and recordings were done during the peak of morning crowd and evening crowd on both sidewalks of each street around the holy shrine. This study showed that the pollution in the evening time span has the maximum level of noise. From the spatial perspective analysis, the most intensive noise pollution was observed around residential and accommodation land uses, which have the highest number of arterial routes towards the holy shrine.

Achieving the maximal or optimal level of productivity is the main goal of any organization. The capital, tools, methods of doing work, and labor force are assumed as efficient factors in productivity. Undoubtedly, the existence of proficient and efficient labor forces is one of the most important tools to attain the goals of the organization, because it plays a striking role in scaling up and down the organization's productivity. If the

In the present study, the research method is descriptive-correlational. The statistical population includes 113 people (50 men and 63 women) of all managers of IKC company. To determine the sample size and select a statistical sample using the Georgian and Morgan table, taking into account the size of the statistical population, which varies in terms of gender, education and managerial rank, a total of 90 people have been considered. Based on the volume of IKC company, the sampling method in the present study was randomly classified and in categories, a statistical sample was selected based on a simple random sampling method. The questionnaires of this research are standard and are taken from the models approved by previous researchers. Research tool also has structural validity [14, 18]. A five-point Likert scale was used to assess and extract the opinion. Cronbach's alpha value also showed that the studied latent variables have good reliability. Tables 2 and 3 show the number of questions to measure each of the hidden variables and the Cronbach's alpha coefficient.

The organization has designed a questionnaire consisting of 15 questions to measure the incidence of organizational citizenship behavior and the dimensions of citizenship behavior (altruism, conscience, chivalry, civic behavior, politeness, and consideration). The response spectrum is of the Likert type and the score of each option is presented in Table 2. The above questionnaire includes five dimensions and the respective questions of each dimension are also presented in Table 2.

The SL questionnaire consists of 16 questions and 5 components, the components of which are shown in Table 3. This questionnaire is based on the Likert scale (strongly disagree = 1; disagree = 2; neither agree nor disagree = 3;

Table 2. Five dimensions of organizational citizenship behavior questionnaires

Subsequent	Relevant questions	Reference
Altruism	1~3	[18]
Conscience	4~6	[19]
chivalry	7~10	[20]
Civil behavior	11~13	[21]
Politeness and consideration	14~16	[22]

Table 3. FSL questionnaire in five components

Scale	Questions	Reference
Vision	1~3	[23]
Altruism	4~7	[24]
Membership	8~10	[25]
Organizational commitment	11~13	[26]
Performance feedback	14~16	[8]

agree = 4; strongly agree = 5). Table 3 shows the FSL questionnaire in five components. In this community, the scores of the questionnaire between 16 ~ 32, 32 ~ 48 and above 48 FSL: low, medium and high were examined, respectively.

The CL questionnaire contains 9 questions. The first five questions are related to leadership modeling and the last four questions are related to the dimension of opportunism. According to the questionnaires collected in this study, Cronbach's alpha coefficient was measured as 0.73, which shows relatively good reliability. Content validity ensures that there are all dimensions and components that can reflect our intended meaning.

To determine the normality of data distribution and also prove the hypotheses, data analysis was performed at two levels descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics (bivariate and multivariate regression tests).

The reliability of the measurement tool through the Cronbach's alpha coefficient in all three variables is expressed in Table 4. The result of Table 4 shows that all three tools have good reliability.

RESULT AND DISCUSSION

Descriptive statistics (frequency table, mean, variance and standard deviation of variables) and inferential statistics (bivariate and multivariate regression tests) were used to summarize and describe the data as well as test the hypotheses. The frequency distribution and percentage of statistical sample according to Table 5, men and women make up 45% and 55%, respectively.

The frequency distribution and percentage of statistical sample by age are presented in Table 6. The result of Figure 4 shows that the average age of managers is 41.33 years.

Table 4. Cronbach's alpha coefficient of research variables

Variable	Cronbach's alpha coefficients
OCB	0.92
SL	0.81
CL	0.85

Table 5. Frequency distribution and percentage of statistical sample in terms of gender

Sexuality	Abundance	Percentage
Woman	50	55
Man	40	45
Total	90	100

Table 6. Frequency distribution and percentage of statistical sample in terms of age

Variable	Standard deviation	Average
Age	7.32	41.33

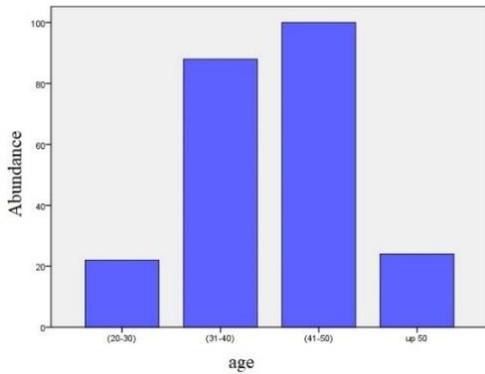


Figure 4. Frequency distribution and percentage of statistical sample in terms of age

Frequency distribution and percentage of statistical sample based on years of service are presented in Table 7. The result of Figure 5 shows that the average service life of managers is 16.16 years.

The frequency distribution and percentage of statistical sample by education are presented in Table 8. The result of Figure 6 shows that most managers have a BSc education.

Tables 9 and 10 show that between the components of spiritual leadership, the max and min averages are related to perspective and membership, respectively. Moreover, between the components of organizational civic behavior,

Table 7. Frequency distribution and percentage of statistical sample based on years of service

Variable	Standard deviation	Average
Years of service	16.16	8.36

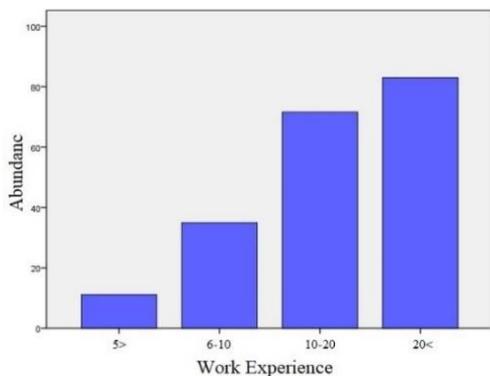


Figure 5. Frequency distribution and percentage of statistical sample according to years of service

Table 8. Frequency distribution and percentage of statistical sample in terms of education

Statistics / Education	Abundance	Percentage
Diploma	0	0
BSc	52	58
MSc	38	42
PhD	0	0
Total	90	100

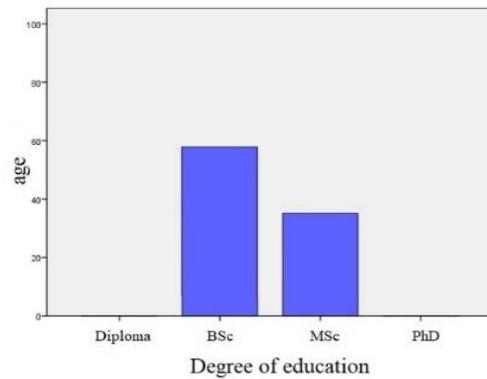


Figure 6. Frequency distribution and percentage of statistical sample in terms of education

the max and min averages are related to conscientiousness and chivalry, respectively.

Table 11 shows that between the CL components, the max and min averages are related to opportunism and modeling, respectively. The distributions of scores for both SL and CL components in histograms are shown in Figure 7.

The normality of score distribution of both the SL and CL components was examined in histogram charts. Figure 7 shows that if the column distribution is not significantly different from the normal distribution, subscales of use will be separated. otherwise, the infrastructure scale is ranked if the distribution is severely skewed. As shown in Figure 7, the distribution of these scores is almost normal.

Table 9. Descriptive indicators of SL components

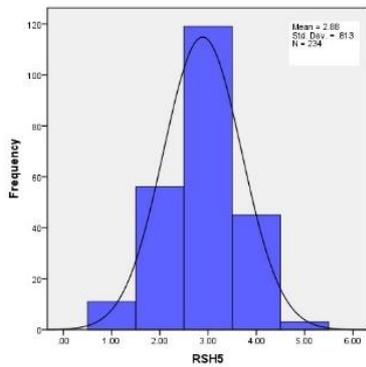
Component / Indicator	Average	Standard deviation
Vision	4.04	0.71
Altruism	3.46	0.94
Membership	3.25	0.99
Organizational commitment	3.62	0.95
Performance feedback	3.50	1.06

Table 10. Descriptive indicators of OCB components

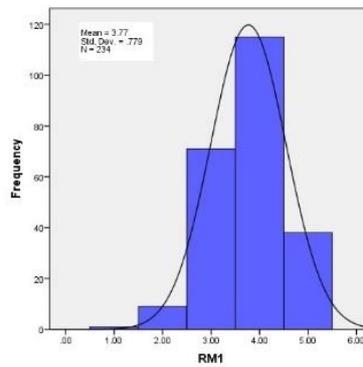
Component Indicator	Conscient iousness	Altruism	Civic virtue	Chivalry	Respect and honor
Average	3.92	3.80	3.16	2.83	3.20
Standard Deviation	0.74	0.56	0.74	0.80	0.77

Table 11. Descriptive indicators of CL components

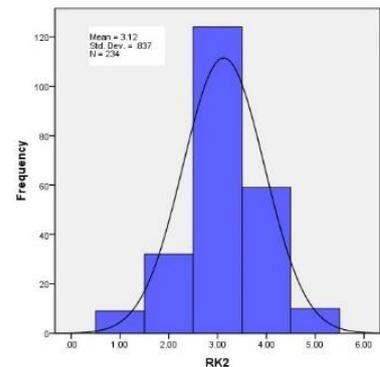
Component Indicator	Modeling	Opportunism
Average	3.52	3.60
Standard Deviation	0.75	1.29



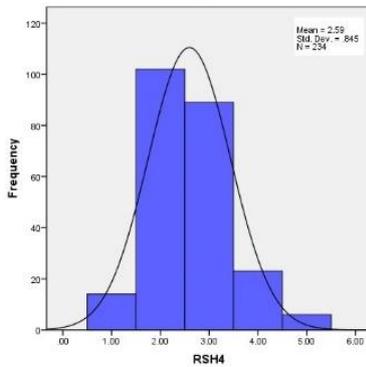
Distribution of respect and honor component scores



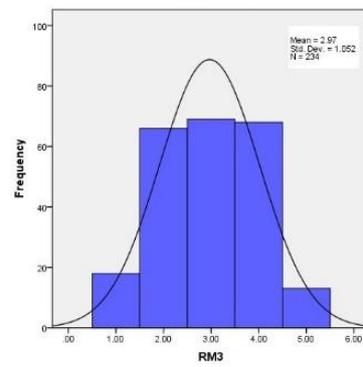
Distribution of the landscape component scores



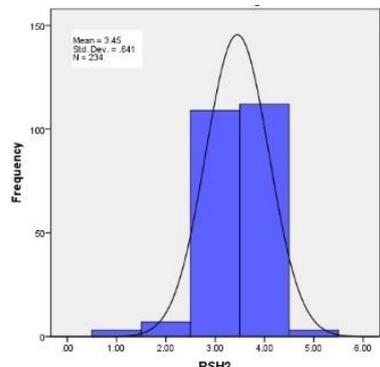
Distribution of modeling component scores



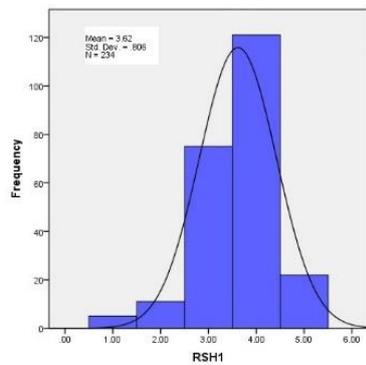
Distribution of chivalry component scores



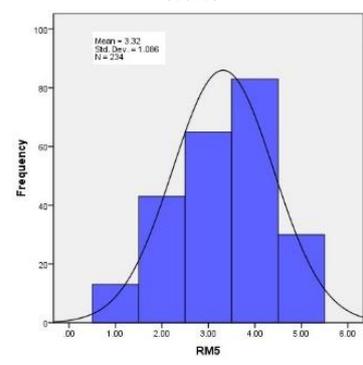
Distribution of membership component scores



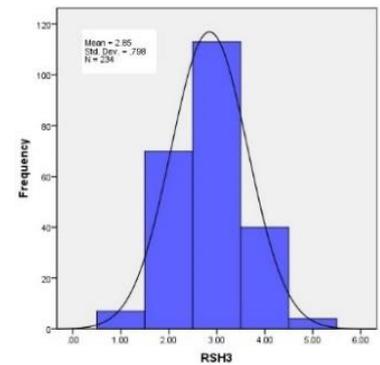
Distribution of altruistic component scores



Distribution of conscientious component scores



Distribution of performance feedback component scores



Distribution of civic virtue component scores

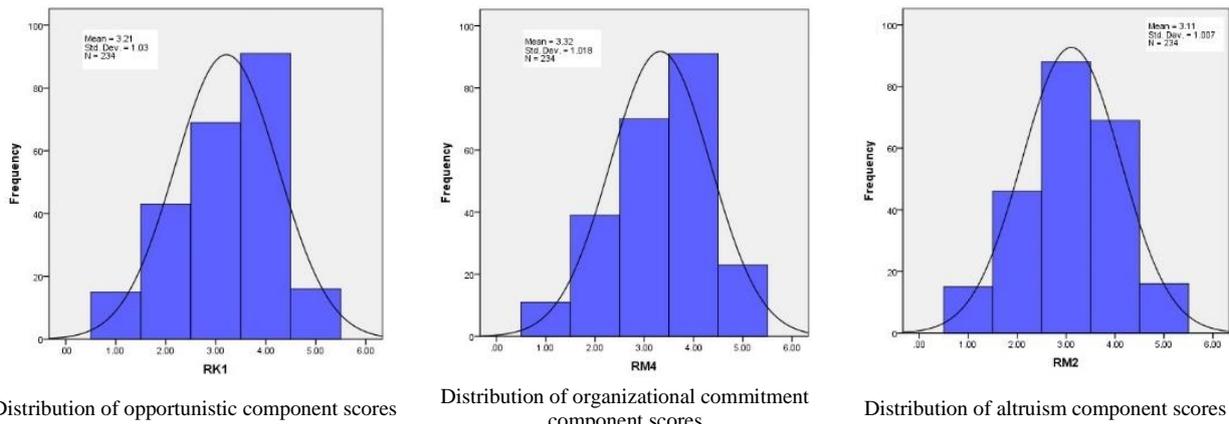


Figure 7. Distribution score of both SL and CL components in histogram diagram

In Tables 12 and 13 according to F-test statistics, there is no relationship between conscientiousness and the SL and CL components.

In Tables 14 and 15 according to F-test statistics, there is no relationship between conscientiousness and components of the SL. A value of R² indicates that a 0.04% variance of conscientiousness can be explained by the components of SL. Moreover, the regression coefficient also shows that organizational commitment ($\beta = 0.22$) can positively and significantly predict conscientiousness.

According to F-test statistics, there is a relationship between altruism and components of the SL. A value of R² indicates that a 0.08% variance of altruism can be explained by the components of SL. The regression coefficient also states that organizational commitment ($\beta = 0.30$) can predict altruism positively and significantly. In Tables 16 and 17 according to F-test statistics, there is no relationship between civic virtue and chivalry in SL components. Moreover, the regression coefficient shows that none of the SL components can predict civic virtue and chivalry.

Table 12. Results of multivariate SL regression analysis and dimensions of organizational civic behavior among managers

Predictive variable	Criteria variables	T	β	R ²	R	P	F
Spiritual leadership	Altruism	2.13	0.14	0.02	0.13	0.034	4.56
	Conscience	3.64	0.23	0.05	0.23	0.00	13.31
	Chivalry	2.70	0.18	0.03	0.18	0.01	7.32
	Civil behavior	2.21	0.14	0.02	0.14	0.03	4.90
	Politeness and consideration	5.61	0.34	0.12	0.35	0.00	31.55

Table 13. Results of bivariate regression analysis of CL and OCB between managers

Predictive variable	Criterion variable	T	β	R ²	R	P	F
CL	OCB	8.37	0.48	0.23	0.48	0.00	70.13

Table 14. Results of multiple regression analysis between the components of SL and conscientiousness between managers

Predictive variable	Criteria variables	T	β	R ²	R	P	F
Vision	Conscientiousness	0.76	0.30	0.02	0.04	0.06	2.14
Altruism		0.38	0.87	0.11			
Membership		0.12	-1.52	-0.17			
Organizational Commitment		0.02	2.22	0.22			
Performance feedback		0.82	-0.22	0.02			

Table 15. Results of multiple regression analysis between the components of SL and altruism among employees

Predictive variable	Criteria variables	P	T	β	R ²	R	P	F
vision		0.15	1.42	0.11				
Altruism		0.36	0.90	0.11				
Membership	Altruism	0.14	-1.46	-0.16	0.08	0.29	0.00	4.40
Organizational Commitment		0.00	3.04	0.30				
Performance feedback		0.14	-1.44	-0.12				

Table 16. Results of multiple regression analysis between the components of SL and civic virtue between managers

Predictive variable	Criteria variables	P	T	β	R ²	R	P	F
Vision		0.15	1.41	0.11				
Altruism		0.42	-0.79	-0.09				
Membership	Civil virtue	0.08	1.73	0.20	0.04	0.20	0.06	2.07
Organizational Commitment		0.80	-0.24	-0.02				
Performance feedback		0.72	0.35	0.03				

Table 17. Results of multiple regression analysis between the components of SL and chivalry between managers

Predictive variable	Criteria variables	P	T	β	R ²	R	P	F
Vision		0.92	-0.09	-0.01	0.03	0.17	0.21	1.42
Altruism		0.97	0.03	0.00				
Membership	Chivalry	0.73	0.33	0.03				
Organizational Commitment		0.77	-0.28	-0.02				
Performance feedback		0.07	1.81	0.16				

In Table 18 according to F-test statistics, there is no relationship between respect and reverence in SL components.

In Tables 19 and 20 according to F-test statistics, there is relationship between respect and reverence and conscientiousness in CL components. Moreover, the regression coefficient shows that the CL components can predict conscientiousness and respect and reverence.

In Tables 21 and 22 according to F-test statistics, there is relationship between altruism and civic virtue in CL components. Moreover, the regression coefficient shows that the CL components can predict altruism and civic virtue. In Table 23 according to F-test statistics, there is relationship between chivalry and respect and honor in CL components. Moreover, the regression coefficient shows that the CL components can predict chivalry and respect and honor.

Table 18. Results of multiple regression analysis between the components of SL and respect between managers

Predictive variable	Criteria variables	P	T	β	R ²	R	P	F
Vision		0.22	-1.21	-0.09	0.15	0.39	0.00	8.21
Altruism		0.41	0.82	0.09				
Membership	Respect and reverence	0.00	2.85	0.30				
Organizational Commitment		0.74	0.33	0.03				
Performance feedback		0.68	0.40	0.03				

Table 19. Results of multiple regression analysis between the components of CL and conscientiousness between managers

Predictive variable	Criterion variable	P	T	β	R ²	R	P	F
Opportunism	Conscientiousness	0.06	1.89	0.13	0.13	0.36	0.00	17.34
Modeling		0.00	3.99	0.27				

Table 20. Results of multiple regression analysis between the components of CL and altruism between managers

Predictive variable	Criterion variable	P	T	β	R ²	R	P	F
Opportunism	Altruism	0.06	1.85	0.13	0.11	0.33	0.00	14.60
Modeling		0.00	3.58	0.25				

Table 21. Results of multiple regression analysis between the components of CL and civic virtue between employees

Predictive variable	Criterion variable	P	T	β	R ²	R	P	F
Opportunism	Civil virtue	0.06	2.04	0.14	0.09	0.30	0.00	12.28
Modeling		0.00	2.79	0.20				

Table 22. Results of multiple regression analysis between the components of CL and chivalry between managers

Predictive variable	Criterion variable	P	T	β	R ²	R	P	F
Opportunism	chivalry	0.13	1.49	0.1	0.08	0.28	0.00	9.84
Modeling		0.00	2.95	0.21				

Table 23. Results of multiple regression analysis between the components of CL and respect between managers

Predictive variable	Criterion variable	P	T	β	R ²	R	P	F
Opportunism	Respect and reverence	0.02	2.26	0.15	0.16	0.40	0.00	22.51
Modeling		0.00	4.46	0.31				

CONCLUSION

Predicting spiritual leadership (SL) and charismatic leadership (CL) in reverse engineering, based on the voice of customer (VOC), between the Iran Khodro Company (IKC) managers (a case study of Peugeot 405 brake pump shell) is the main goal of this research.

The descriptive-correlation method is applied in this study and its statistical population included the entire IKC staff (113 people). Using a classified sampling method proportional to content, 90 people are chosen as the statistical samples between which the research questionnaires are distributed. Two standard questionnaires of organizational citizenship behavior and spiritual leadership, which were developed based on the Likert Scale, as well as a researcher-made questionnaire of charismatic leadership, which was approved by educational science experts, are the data collection tools.

The questionnaires on organizational citizenship behavior, spiritual leadership, and charismatic leadership respectively contain 14, 16, and 9 items. Determining the content validity, questionnaires are qualified with the approval of educational science experts, and engineers specializing in reverse engineering, management, and their reliability coefficients were respectively calculated as 0.72, 0.94, and 0.72.

- Considering the significance of the relationship between SL and total quality management in IKC in

general, it is suggested that the mentioned managers of this company focus more on drawing the desired organizational vision and even in this field while taking into account the opinions of employees and justifying them to the future of the organization, from strategic planning consultants use. Leaders of the IKC are also required to take into account the interests and educational interests of their customers who take on the role of future two social roles are countries, in creating their satisfaction as well as strengthening try their scientific strength. This is an important researcher will not be unless they involve employees in decisions participate and, by encouraging and motivating them, a sense of responsibility, build loyalty and faith in work them.

- Considering the results of the first sub-hypothesis test, based on the existence positive and meaningful relationship between SL and all components total quality management requires two managers and staff the IKC should take a step towards establishing the SL style while providing continuous feedback and informing employees about the ratio give them the results of their work regarding the future of the organization and how by holding Serve the client more sensitively. Also, organizational behavior workshops recall altruism. To create the feeling in people that clients are worthy; should be benevolent towards them and this belief forms make sure that clients are eager to receive quality services. Also in connection with the meaningful dimensions and faith

of the workers, managers and the leaders of the organization can hold specialized workshops, and introduce people to the value of quality work and its value.

- According to the test results of hypotheses, the effect of management spirituality is required on total quality management at IKC an approach by creating motivations derived from human values adopting an ethical and human-centered approach to employees to him, relying on professional, moral, and professional responsibilities try harder to empower themselves provide better services to students. The obvious is to provide job training in long-term training courses and short-term workshops and in-service training for employees in this regard, it is necessary.

Based on the above-mentioned findings and limitations, the present study proposes some suggestions for future investigations as follows:

- Application of machine learning computations and Fuzzy logic for production prediction based on hidden layers.
- Using the questionnaire in a study environment beyond the automotive industry
- Use of hybrid modeling methods and comparison between results within the organization

AUTHOR CONTRIBUTIONS

Imani-Hassanlou (40%) and Tagimalek (10%) planned the scheme, initiated the project and suggested the experiments; Imani-Hassanlou and Maraki (30%) conducted the experiments and analyzed the empirical results; Tagimalek (20%) developed the mathematical modeling and examined the theory validation. The manuscript was written through the contribution of all authors.

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CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship and publication of this article.

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Persian Abstract

چکیده

امروزه فروش مهمترین رکن یک مجموعه تولیدی است. نکات مثبت و قابل توجه قطعات تولید شده با مصاحبه با مشتری، ارسال پرسشنامه برای مشتری، تست بازار، بررسی کیفیت و قابلیت اطمینان محصولات جدید، بررسی گزارشها و کیفیت محصول رقبا به دست می‌آید. پژوهش حاضر با هدف پیش‌بینی رهبری معنوی و کارزماتیک در مهندسی معکوس بر اساس "صدای مشتری" در بین مدیران شرکت ایران خودرو (مطالعه موردی پوسته پمپ ترمز پژو ۴۰۵) انجام شد. با استفاده از روش تحقیق توصیفی-همبستگی، حدود ۹۰ نفر از مدیران در چند دسته بر حسب جنسیت، سن و سنوات خدمت، متناسب با اندازه هر دسته به طور تصادفی انتخاب شدند. برای جمع‌آوری داده‌های تحقیق از سه پرسشنامه رفتار شهروندی سازمانی اورگان و کانوفسکی، رهبری معنوی فرای و رهبری کارزماتیک استفاده شد. برای سنجش میزان پایایی با استفاده از ضریب آلفای کرونباخ، این سویه برای هر سه پرسشنامه رفتار شهروندی سازمانی اورگان و کانوفسکی، رهبری معنوی و رهبری کارزماتیک به ترتیب ۰/۹۲، ۰/۸۱ و ۰/۸۵ بدست آمد. پس از جمع‌آوری داده‌ها با استفاده از تحلیل رگرسیون چندگانه و بر اساس فرضیه‌های تحقیق مورد تجزیه و تحلیل قرار گرفت. نتایج نشان داد که بین ابعاد رهبری معنوی و رفتار شهروندی سازمانی و همچنین بین رهبری کارزماتیک و رفتار شهروندی سازمانی رابطه مثبت و معناداری وجود دارد. همچنین نتایج مدل‌سازی معادلات ساختاری نشان داد که رهبری معنوی با ضریب مسیر ۰/۷ می‌تواند بر مدیریت کیفیت کلی تأثیر بگذارد ($t \geq 1/96$ ، $p \geq 0/05$).