

# Evaluating the impact of environmental management and implementation of ISO 14001 standard on organizational innovation due to the mediating role of knowledge transfer

Zahra Sadat TAGHAVI<sup>1</sup>, Mehran KHALAJ<sup>2</sup>, Hossein AMOZAD KHALILI<sup>3</sup>

<sup>1</sup> Department of Industrial Management, Electronic Branch, Islamic Azad University, Tehran, Iran.

<sup>2</sup> Department of Industrial Engineering, Robat Karim Branch, Islamic Azad University, Tehran, Iran.

<sup>3</sup> Department of Industrial Engineering, Nowshahr Branch, Islamic Azad University, Nowshahr, Iran.

## Corresponding Author:

Hossein AMOZAD KHALILI

Amoozad92@yahoo.com

**Abstract:** The main objective of this study was to evaluate the impact of environmental management and implementation of ISO 14001 standard on organizational innovation due to the mediating role of knowledge transfer. The research methodology was based on an applied objective-based study and it can be considered surveying-correlation approach in terms of data collection and analysis methods. The research statistical population consisted of managers and employees of Sina Insurance Company. Using the Krejcie and Morgan table, 92 individuals were identified as statistical samples. A questionnaire was used to collect data in order to test the research hypotheses. To analyse data, the structural equation modelling method was employed for examining the fit of the structural equation modelling and for testing the research hypotheses. According to the results obtained, the implementation of ISO 14001 standard and environmental management directly explain 0.413% and 0.552% of changes related to the organizational innovation of Sina Insurance Company, respectively. Also, the Sobel test results revealed that the implementation of ISO 14001 standard and environmental management have a positive and significant impact on the organizational innovation through the mediating variable of knowledge transfer at a confidence level of 95%.

**Keywords:** Environmental Management, ISO 14001 Standard, Organizational Innovation, Knowledge Transfer.

## 1. Introduction

Environmental protection is nowadays one of the most strategic tools of modern commerce which is related to the customers' needs, competitive pressures, and opportunities for environmental resources. As it was shown by different studies, besides implementing environmental management requirements, companies need to pay special attention to quality management to improve quality, increase productivity, and reduce structural costs such with quality costs (Li et al., 2018). Quality management systems like ISO 14001 standard and environmental management have many common points with regard to executive issues such as focusing on stakeholders, leadership, and attention to people. Therefore, one can say that quality management in an organization provides the conditions which are necessary in order operationalize environmental management requirements. Knowledge transfer is another process that plays a major role for the success of companies (Mubako et al., 2017). In the last few decades, many experts and researchers have been looking for the best methods to transfer knowledge. The concept of knowledge transfer was initially confined to the field of individual psychology; however today, it has become an important concept in the literature of strategic management. According to the research conducted on knowledge transfer, one can conclude that knowledge transfer is a very effective factor in the organizational innovation (Weidenfeld et al., 2010). Quality management is

an important basis and principle in improving innovation in a certain organization. Implementing the quality management principles indeed provides an environment, which encourages the organization to transfer knowledge and move toward innovation. According to Porter (1991), the benefits of applying environmental management principles are much more important and useful than the costs related to the regulatory standards in organizations, which undoubtedly leads to innovation. In fact, one can argue that the competitive opportunities created by an organization by using environmental management principles can lead to organizational innovation. Many research results have demonstrated that adherence to environmental requirements and regulations has been very influential as regards the organizations' tendencies with respect to the issue of innovation (Bocken et al., 2011). Given the importance of deploying and continually paying attention to quality management issues and the environmental management requirements in organizations which are meant for finding optimal methods for knowledge transfer and for achieving innovation development at organizational level, in this research, we sought to answer the following question: How does the implementation of environmental requirements and of the ISO 14001 standard in the form of quality management influence the organizational innovation of Sina Insurance Company given the mediating role of knowledge transfer?

Based on the review of the research literature, one can say that some studies have been carried out on the impact of quality management and environmental management on knowledge transfer and organizational innovation separately; but no independent research has been done for examining and identifying the impact of applying environmental requirements and ISO 14001 standard in the form of quality management on knowledge transfer and organizational innovation. This research was focused on analyzing the effects of implementing environmental management requirements and ISO 14001 standard on knowledge transfer and organizational innovation for the first time in order to eliminate the research gap in the aforementioned context so that the beneficiaries, namely the companies operating in the Iran's insurance industry in general, and Sina Insurance Company in particular, can benefit from its results.

## 2. Research literature review

### - Environmental Management – Organizational Innovation

The concepts of sustainability and environmental innovation in organizations have nowadays turned into highly important and applicable concepts (Bossle et al., 2016). Organizations gain a lot of benefits by operationalizing the measures related to environmental management principles, including reduced structural costs, increased efficiency of the organization's performance, and the development of business opportunities. The results of a study by (Frondele et al., 2007). Indicated that there is a positive and significant relationship between environmental management and environmental innovation. This type of innovation involves the development and implementation of new ideas, behaviors, products, and processes, which helps reduce environmental costs or achieve specific environmental sustainability goals. The core of environmental management includes identifying customer's needs, receiving feedback on the customer's satisfaction, and making decisions about the improvement of products and various processes (Darnall et al., 2010). In recent decades, environmental innovations have drawn the attention of academic and non-academic scholars, researchers, and policymakers in order to reduce or prevent the negative effects on the environment (Dong et al., 2014). Environmental innovation as a general concept involves themes such as pollution control, green products production, clean technology processes implementation, the use of green energy and transportation technology, transportation techniques, and waste reduction (Kemp & Pontoglio, 2011). The results of the study by (Alfranca et al., 2009) showed that the use of two environmental and quality strategies enhances production and productivity and environmental strategies and quality management will have a highly positive impact on the innovative activities of the analysed companies. (Jackson et al., 2016) found in their research a positive and significant relationship between the performance of the organization and the variable represented by the environmental performance of organizations. Also, the role of innovation as a mediator variable in quality management is highly significant in influencing the environmental and business performance of an organization.

### **- Quality management and organizational innovation**

Quality management alone is not enough to guarantee the organization's competitive status in its surrounding environment. Innovation is also needed to create a competitive advantage and this issue has drawn the researchers' attention to the relationship between quality management and innovation (Manders, De Vries, Blind, 2016). Quality management is not only an important foundation for improving innovation but also is known as a facilitator of innovation process as its flow into the organization is concerned. as its flow into the organization is concerned. Certain empirical studies have shown that quality management is positively associated with innovation (Abrunhosa & Moura E Sá, 2008). Li et al. (2018) noted in their research that the principles of quality management effectively help organizations achieve sustainable development and the organization's processes benefit from significant innovations by applying these principles. In fact, companies that choose to follow the principles and concepts related to quality management and implement them categories in the organization will provide a conducive environment for individual and group innovations. Jackson et al. (2016) introduced a new term "Coin(age)", which is related to the relationship between quality management and innovation. The term is defined as follows: it included those key elements of TQM, which particularly support the promotion of innovation in products and processes. (Bourke & Roper, 2017) found in order to increase the performance of an organization, innovation and improving the product quality are necessary. At the same time, taking into consideration the requirements such as ISO 14001 standard can be very effective.

### **- Knowledge transfer and organizational innovation**

The goal of knowledge transfer is to increase the speed of innovations and facilitate them (Musial et al., 2013). Understanding the factors that drive innovation and innovative performance is nowadays essential for organizations and the transfer of knowledge is a central issue in this context. Innovation is the result of new knowledge and new knowledge is created following the sharing and transfer of knowledge within the organization (Liao et al., 2010). Knowledge transfer and organizational innovation are two interrelated issues and knowledge transfer provides some opportunities for innovation capability (Jimenes & Sanz-Valle, 2011). Lin (2007) examined the impact of individual and organizational knowledge transfer technology on the organizational innovation and concluded that the level of knowledge and efficiency, supported by the senior management and ICT systems have a great impact on knowledge transfer behaviors and these behaviors can enhance the capacity for organizational innovation. Knowledge transfer is a key tool for the exchange of knowledge and experience among employees and organizations can use it to create new knowledge, innovate, and gain competitive advantage (Taminiau et al., 2009). Interactions between employees lead to people sharing knowledge through feedback, interpretation, assistance or consultation, which will improve the organization's performance.

### **- Research hypotheses**

In accordance with the objective of this study and in order to answer its main question regarding the evaluation of the impact of environmental management and ISO 14001 standard implementation on organizational innovation given the mediating role of knowledge transfer, the research hypotheses are as follows:

H1: Implementing ISO14001 standard has a positive and significant impact on organizational innovation.

H2: Environmental management has a positive and significant impact on organizational innovation.

H3: Implementing ISO14001 standard has a positive and significant impact on knowledge transfer.

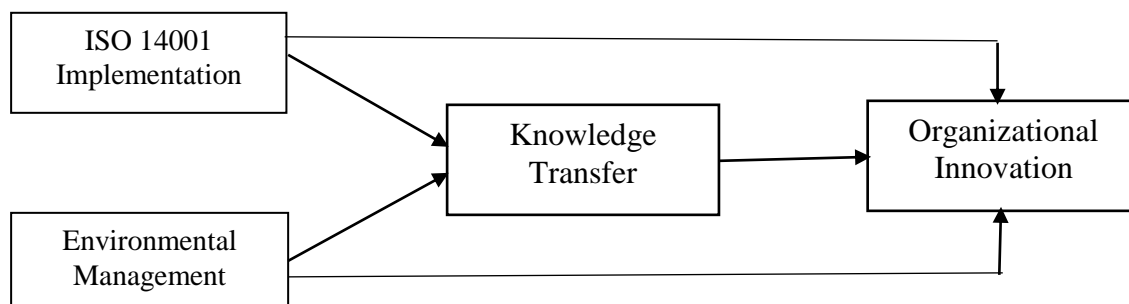
H4: Environmental management has a positive and significant impact on knowledge transfer.

H5: Knowledge transfer has a positive and significant impact on organizational innovation.

H6: Implementing ISO14001 standard through knowledge transfer has a positive and significant impact on organizational innovation.

H7: Environmental management through knowledge transfer has a positive and significant impact on organizational innovation.

The research conceptual model based on the research hypotheses is shown in Fig. 1, in which, the variables of environmental management and the implementation of ISO14001 standard are seen as independent variables, while knowledge transfer is a mediating and dependent variable. Also the organizational innovation variable is a dependent variable.



**Figure 1.** The research conceptual model

### 3. Research methodology

Methodologically, this research is a correlational one. The present study is a descriptive research based on how to obtain the required data and in terms of classifying a research process according to its purpose. This study is also an applied one as its objective is concerned and a descriptive-surveying one in terms of methodology. The library resources, including available books and scientific articles were used to gather the necessary information in order to compile the relevant research literature. We also used four standard questionnaires to collect the data needed to test the research hypotheses. The questionnaire of (Su et al., 2008) was used to assess the implementation of the ISO14001 standard in the form of quality management, and it consisted of eight questions. The questionnaire developed by (Jabbour et al., 2013) was used to measure environmental management variable, and it included eight questions. The Donate et al. (2015) questionnaire, which included eight questions, was employed to measure knowledge transfer variable. Also the (Reverte et al., 2016) questionnaire, which included five questions, was used to measure organizational innovation variable. To verify the content validity, the questionnaire presented in this research paper was evaluated by several management experts. After making some corrections and getting the experts' approval for higher reliability and an acceptable face validity, 15 questionnaires were distributed among the aforementioned, statistical population the study population included all managers, assistant managers, and experts of the headquarters of Sina Insurance Company in Tehran. According to different surveys that have been carried out, their number was estimated to be 120. Using simple random sampling method and Krejcie and Morgan table, 92 subjects were selected as a statistical sample. Therefore, the approved questionnaire was distributed among 92 members of Sina Insurance Company. In this study, the structural equation modeling method together with the partial least squares method in Smart PLS software were used in order to test the research hypotheses and with the purpose of fitting the conceptual model. PLS is a variance-based approach that has fewer requirements as compared to similar techniques based on structural equations such as LISREL and AMOS (Liljander et al., 2009). This method is very useful in cases where the number of samples and measurement items are limited and the distribution of variables can be uncertain (Hair et al., 2010). The structural equation method in PLS is applied in two steps. In the first step, the measurement model should be examined through reliability and validity analyzes, and in the second step, the structural model of the research needs to be assessed by estimating the path between the variables and determining the model fit indices (Hulland, 1999).

## 4. Research findings

The model analysis algorithm related to the Smart-PLS-SEM method was used to test the research conceptual model as follows and the necessary analyses were carried out in three parts:

1. Fitting the measurement models
2. Fitting the structural model
3. Overall fitting of the research model (measurement and structural model)

Thus, using reliability and validity criteria, the accuracy of the relationships in the measurement models was initially ensured. Then, the relationships in the structural section were explored and interpreted. Finally, the overall fitting of the research model was investigated. In this study, the Kolmogorov-Smirnov test was used to verify the assumption of normality of data, The results of this test are illustrated in Table 1.

**Table 1.** The test results related to verifying the normality of the data distribution

Variable	P-value	Statistic
ISO 14001 Standard	0.000	0.083
Environmental Management	0.000	0.097
Knowledge Transfer	0.000	0.115
Organizational Innovation	0.000	0.090

The results of this test showed the significance level of the research variables higher than 0.05. Hence, with a probability of 0.95, we can accept that the research variables have a normal distribution.

### - The measurement models fitting

The fitting of the measurement models involves evaluating the reliability and validity of the research constructs. The test reliability is related to measurement accuracy and stability. (Fornell & Larcker,1981) proposed three criteria for evaluating the reliability of constructs:

1. The reliability of each question
2. The combined reliability of each construct
3. The extracted mean variance

In the present study, based on PLS-Structural Equation Modeling Method, three criteria were used to evaluate the fitness of measurement models, that is reliability, convergent validity, and divergent validity and the following results were obtained.

1. Reliability: The criteria of factor loadings`coefficients, Cronbach's alpha, and the combined reliability were calculated as follows to evaluate the reliability of constructs?

2. Factor loadings measurement

Reliability of each item refers to the factor loading value of each of the observed variables and is used to determine how well the criteria are used to measure hidden variables, and at least a value of 0.3 is acceptable. And a value of 0.4 indicates a medium significance level. Also in confirmatory factor analysis, factor loading values above 0.5 indicate strong significant level and high correlation between observed variables and factor and also indicates that the structure is well defined. The values of the factor loadings related to the research questions are reported in Table 2.

### - Cronbach's alpha

Internal stability indicates the degree of correlation of a structure and its related indices. Values above 0.7 indicate that this coefficient is acceptable. The results are reported in Table 2.

### - Combined reliability

The superiority of this criterion over the Cronbach's alpha coefficient is that the reliability of the structures is calculated not in absolute terms but by the correlation of their structures with each other. A composite reliability value above 0.7 for each construct indicates good internal consistency for the measurement models.. The results are presented in Table 2.

### 3. Validity

When applying the method of modeling the structural equations, the validity criterion is examined by means of Two methods which are based on convergent validity and divergent validity.

### - Convergent Validity

After examining the three aforementioned reliability criteria, the convergent validity is the second criterion of the measurement models fitting. The convergent validity criterion indicates the mean of the variance shared between each construct with its indices and a value of 0.4 and higher for this criterion is considered appropriate. The results obtained by applying this criterion are reported in Table 2. After obtaining the values of factor loadings and Cronbach's alpha coefficients, combined reliability, and the mean variance extracted through analyses and software output, the fitness of reliability and convergent validity of the research model can be confirmed, given that the values of each of the above-mentioned criteria are better defined than the quorum and threshold for each of the hidden variables.

**Table 2.** The results of factor loadings and model quality assessment criteria

Construct	Question	Factor loading	Cronbach's alpha	Combined reliability	Convergent validity	Shared values	Redundancy values
ISO 14001 standard	ISO1	0.579	0.728	0.828	0.631	0.452	0.000
	ISO2	0.870					
	ISO3	0.708					
	ISO4	0.789					
	ISO5	0.541					
	ISO6	0.639					
	ISO7	0.439					
	ISO8	0.902					
Environmental Management	EM1	0.519	0.827	0.822	0.490	0.666	0.000
	EM2	0.410					
	EM3	0.607					
	EM4	0.598					
	EM5	0.799					
	EM6	0.770					
	EM7	0.695					
	EM8	0.555					
Knowledge Transfer	KT1	0.876	0.721	0.785	0.977	0.543	0.337
	KT2	0.745					
	KT3	0.774					
	KT4	0.572					
	KT5	0.649					
	KT6	0.791					
	KT7	0.895					
	KT8	0.708					
Organizational Innovation	OIN1	0.440	0.731	0.707	0.567	0.602	0.242
	OIN2	0.613					
	OIN3	0.696					
	OIN4	0.758					
	OIN5	0.771					

The third criterion for measuring the fit of measurement models in PLS analyzes is divergent validity, which was examined in this study by means of the method proposed by (Fornel & Larcker, 1981). According to the above-mentioned method, the divergent validity is confirmed if the squared mean variance extracted for each construct is greater than the correlation between the constructs. This method examines the aforementioned issue by means of a matrix, whose cells contain the values of the coefficient of correlation between the constructs and the square root of the convergent validity values of each construct. The results obtained by applying this criterion are presented in Table 3. They show that since the value of the root mean square of the extracted variance corresponding to each construct in the present study located in the cells in the original diameter of the matrix and here the main diagonal is the numeric values that are at the first level of each column that is higher than their correlation index in the lower cells of the original diameter, one can say that in the present study, the model constructs interact more with their indices rather than with other constructs. In other words, the divergent validity of the model is appropriate.

**Table 3.** Divergent validity results

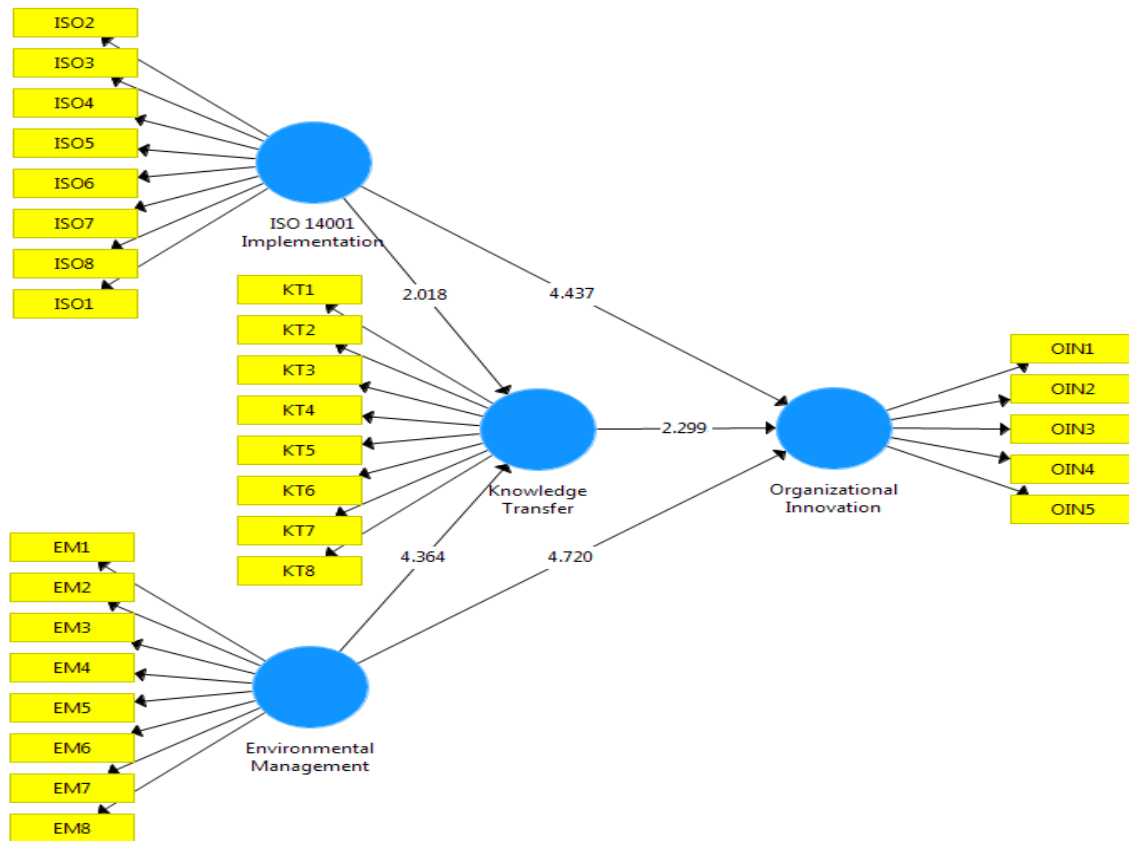
Construct	ISO 14001 Standard	Environmental Management	Knowledge Transfer	Organizational Innovation
ISO 14001 standard	0.794			
Environmental Management	0.506	0.700		
Knowledge Transfer	0.531	0.658	0.988	
Organizational Innovation	0.612	0.655	0.871	0.752

#### - Structural model fitting

Unlike measurement models, in which, the relationships between hidden variables and explicit variables are considered, when examining the structural model, the relationships between hidden variables are analyzed and the criteria of significance coefficients (t-values), R-Squares criterion or  $R^2$ , and the redundancy criterion are evaluated to fit the structural model.

#### 1. Significance t values

The partial least squares method uses various criteria to evaluate the fitting of the research structural model and the most important criterion is the significance coefficient of t. If the value of t-statistic is higher than 1.96, at the 5% error level, the relationship between the research constructs is verified, and as a result, the research hypotheses are confirmed. The results of this test are displayed in Figure 2. Given that all the numbers on the paths are higher than 1.96, this indicates that the paths are meaningful, the structural model is fit, and thus, all the research hypotheses are confirmed.



**Figure 2.** The T-values for evaluating the structural part of the model

## 2. R-Squares criterion

This criterion is the second indispensable one for examining the fitness of the structural model, which involves evaluating the coefficients of determination related to the model (dependent) endogenous variables. This criterion is used to connect the measurement and structural components of structural equation modeling, and it indicates the effect of an exogenous variable on an endogenous variable. Concerning the acceptable value for this criterion, (Chin, 2010) introduced three values, namely 0.19, 0.33, and 0.67 as weak, moderate, and strong criteria of  $R^2$  criterion. The values of  $R^2$  can be seen in Fig. 3. Considering the values related to the above-mentioned criterion, the suitability of the structural fit is confirmed.



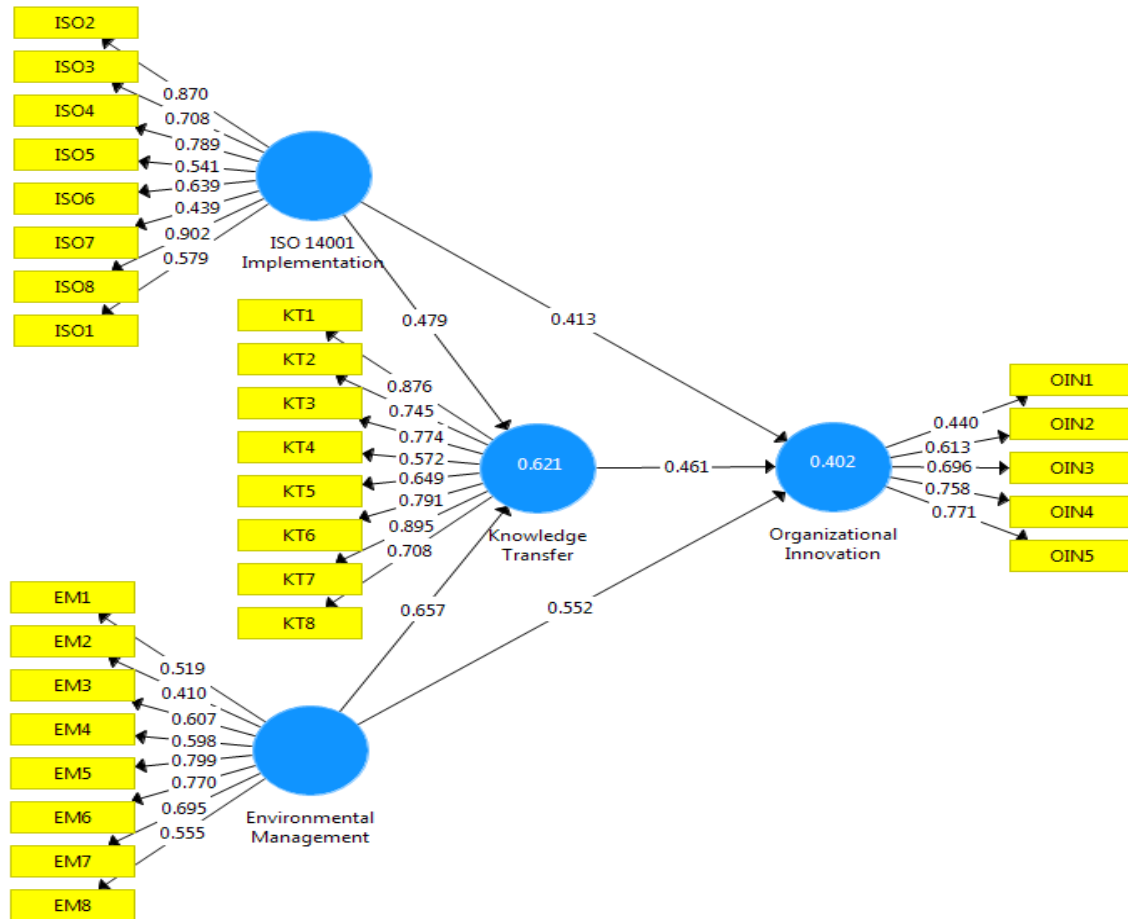


Figure 3. The values of path coefficients, factor loadings, and R<sup>2</sup>

### 3. Redundancy criterion

This criterion is obtained by multiplying the shared values of the constructs by their R<sup>2</sup> values, and it indicates the variability rate of the indices of an endogenous (dependent) construct influenced by one or more exogenous (independent) constructs. The mean redundancy index is a general measure of the quality of the structural model that applies to all endogenous constructs and is only calculated for use in the formula for calculating the overall model fitting and index of goodness of fit. According to the results, the redundancy criterion value for the variables of knowledge transfer and organizational innovation is 0.337 and 0.224, respectively, and these values indicate a high and an acceptable fit of the structural model.

#### - The general model fit based on GOF criterion

The GOF (Goodness of Fit) criterion was used to evaluate the fit of the overall model, which controls both the measurement and structural model components. This criterion was introduced by (Tenenhaus et al., 2004) and is calculated according to the following equation:

$$GOF = \sqrt{\text{average}(\text{Communality}) \times \text{average}R^2}$$

This criterion is defined by three values of 0.01, 0.25, and 0.36 which are weak, moderate and strong, respectively (Wetzels et al., 2009). According to the calculations, the mean shared values of coefficients of determination are 0.511 and 0.565, respectively.

$$GOF = \sqrt{0.565 \times 0.511} = 0.537$$

Given the value obtained by applying the GOF criterion. As a result, the value of this index is 0.537, which indicates a strong overall fit to the three values of 0.01, 0.25 and 0.36 as weak, medium and strong values for the GOF.

### - Testing the hypotheses

At this stage, the research hypotheses are tested according to the results obtained for the t-values and path coefficients based on the research data analysis algorithm and by using the partial least squares method. If the significance coefficient of each path is higher than 1.96, the corresponding path is significant at 95% confidence level and the respective hypothesis is confirmed. It should be mentioned that since the knowledge transfer variable plays a mediating role in this research, the Sobel and Waff test was used to measure it. The results of testing the H1 to H5 hypotheses are reported in Table 4.

**Table 4.** The results of testing hypotheses 1 to 5

Research Hypotheses	Path Coefficient	t-value	Result
The impact of implementing ISO 14001 standard on organizational innovation is positive.	0.413	4.437	Confirmed
The impact of environmental management on organizational innovation is positive.	0.552	4.720	Confirmed
The impact of implementing ISO 14001 standard on knowledge transfer is positive.	0.479	2.108	Confirmed
The impact of environmental management on knowledge transfer is positive.	0.657	4.436	Confirmed
The impact of knowledge transfer on organizational innovation is positive.	0.461	2.299	Confirmed

### - Testing hypotheses based on the mediator variable of knowledge transfer

The Sobel test is used to examine the significance of the mediating effect of a variable on the relationship between two variables, and if its value at 95% confidence level is greater than 1.96, it indicates a significant mediating effect of the relevant variable. In addition to the Sobel test carried out for examining the significance of the mediating effect of a variable, the VAF statistic can also be used to determine the severity of the above-mentioned effect, which is expressed by a value between 0 and 1 and the closer it is to 1 the greater the effect of the mediator (Preacher & Leonardelli, 2003). In the Sobel test, a Z value is obtained through the following equation.

$$Z - \text{Value} = \frac{a \times b}{\sqrt{(b^2 \times S_a^2) + (a^2 \times S_b^2) + (S_a^2 \times S_b^2)}}$$

Where,

Parameter a: The path coefficient between the independent variable and the mediator variable

Parameter b: The path coefficient between the mediator variable and the dependent variable

Parameter S<sub>a</sub>: The standard error of the independent and mediator variables path

Parameter S<sub>b</sub>: The standard error of the mediator and dependent variables path

$$\text{- Hypothesis 6} = \frac{(0.479 \times 0.461)}{\sqrt{(0.461^2 \times 0.119^2) + (0.479^2 \times 0.103^2) + (0.119^2 \times 0.103^2)}} = \frac{0.220}{0.0745} = 2.96$$

$$\text{- Hypothesis 7} = \frac{(0.657 \times 0.461)}{\sqrt{(0.461^2 \times 0.101^2) + (0.657^2 \times 0.116^2) + (0.101^2 \times 0.116^2)}} = \frac{0.303}{0.089} = 3.40$$

According to the results of Sobel test, one can conclude that at 95% confidence level, the ISO 14001 standard implementation and environmental management variables influence organizational

innovation through the mediator variable of knowledge transfer in the context of Sina Insurance Company.

VAF test: The value of this test is obtained by the following relation.

$$VAF = \frac{a \times b}{(a \times b) + c}$$

where,

a: The value of the path coefficient between independent and mediator variables

b: The value of the path coefficient between dependent and mediator variables

c: The value of the path coefficient between dependent and independent variables

$$\text{- Hypothesis 6} = \frac{0.479 \times 0.461}{(0.479 \times 0.461) + 0.413} = 0.347$$

The value of 0.347 means that more than one third of the impact of implementing ISO 14001 standard on organizational innovation is indirectly explained by the mediator variable of knowledge transfer.

$$\text{- Hypothesis 7} = \frac{0.657 \times 0.461}{(0.657 \times 0.461) + 0.552} = 0.353$$

The value of 0.353 means that more than one third of the impact of environmental management on organizational innovation is indirectly explained by the mediator variable of knowledge transfer.

## 5. Discussion & Conclusion

The purpose of this research was to evaluate the impact of environmental management and implementation of ISO 14001 standard on organizational innovation due to the mediating role of knowledge transfer in the Iranian insurance industry, and in particular, in Sina Insurance Company. To this end, after surveying the specialised literature on this subject and research background, the research hypotheses and conceptual model were defined. The structural equation modeling method was used to fit the research model and test the hypotheses. The results of testing the first research hypothesis revealed that the implementation of ISO 14001 standard has a positive and significant impact on organizational innovation and implementation of ISO 14001 standard directly explains 0.413% of changes related to the organizational innovation variable. The aforementioned results were consistent with the results of (Basu & Bhola, 2016). Based on these results, one can argue that creating the right conditions for a proper identification and implementation of the environmental requirements related to the ISO 14001 standard can help Sina Insurance Agency achieve a proper environmental management and, therefore, contribute to an optimal organizational innovation. The testing results of the second research hypothesis showed that the environmental management has a positive and significant effect on organizational innovation and that environmental management directly explains 0.555% of changes related to organizational innovation. The results were consistent with the results of the studies carried out by (Hamdoun et al., 2018) and (Alfranca et al, 2009). The aforementioned results demonstrate the importance of paying attention to environmental management on the path to organizational innovation. The results of testing the third research hypothesis revealed that the implementation of ISO 14001 standard has a positive and significant effect on knowledge transfer and the implementation of the ISO 14001 standard directly explains 0.479% of changes concerning the knowledge transfer variable. The above-mentioned were consistent with the results of the study of (Aboulnaga, 1998). Accordingly, we recommend that senior executives of Sina Insurance Company proper conditions by creating a dynamic network for collecting comments and suggestions, and in particular, the knowledge and experiences related to environmental issues that the employees share their among them and strive to help the

organization achieve this important goal by knowledge sharing and the transfer of experience. The results of the fourth testing research hypothesis showed that the environmental management has a positive effect on knowledge transfer and directly explains 0.657% of changes related to knowledge transfer. These results were consistent with the results of Hamdoun et al. research (2018). The results of the fifth testing research hypothesis indicated that the knowledge transfer has a positive impact on organizational innovation and directly explains 0.461% changes concerning organizational innovation. The results of the sixth testing and seventh hypotheses, which examined the impact of ISO 14001 standard implementation and environmental management on organizational innovation through the mediating variable of knowledge transfer, showed that the two above-mentioned variables have a positive and significant impact on organizational innovation when knowledge transfer acts as the mediating variable. Each of these variables (ISO 14001 standard and environmental management) in the aforementioned conditions directly explains more than a third of the changes related to the organizational innovation variable. According to the results obtained, taking into account the impacts of environmental management requirements and ISO 14001 standard on the organizational innovation, the executives of Sina Insurance Company can make progress on the path of achieving organizational innovation in addition to reaching the organization's environmental goals and completing its environmental programs in line with corporate social responsibility. At the same time, one cannot overlook the crucial role of the knowledge transfer component. We tried in this study to examine the impact of variables of environmental management and ISO 14001 standard implementation on organizational innovation by considering the mediating role of knowledge transfer. In the end, it can be mentioned that other researchers could focus their future studies on addressing the impact of the above-mentioned and mediating variables on other dimensions of innovation such as strategic innovation and gradual innovation.

## REFERENCES

1. Aboulnaga, I. M. (1998). *Integrating quality and environmental management as competitive business strategy for 21st century*. Environmental Management and Health. 9(2), 65-71.
2. Abrunhosa, A., Moura E Sá, P. (2008). *Are TQM principles supporting innovation in the Portuguese footwear industry?* Technovation. 28, 208-221.
3. Alfranca, O., Diaz-Balteiro, L., Casimiro Herruzo, A. (2009). *Technical innovation in Spain's wood-based industry: The role of environmental and quality strategies*. Forest Policy and Economics. 11, 161-168.
4. Basu, R., Bhola, P. (2016). *Impact of quality management practices on performance stimulating growth: Empirical evidence from Indian IT enabled service SMEs*. International Journal of Quality & Reliability Management. 33(8), 1179-1201.
5. Bocken, N. M. P., Allwood, J. M., Willey, A. R., King, J. M. H. (2011). *Development of an ecoideation tool to identify stepwise greenhouse gas emission reduction options for consumer goods*. Journal of Cleaner Production 19, 1279-1287.
6. Bossle, M. B., Barcellos, M. D., Vieira, L. M., Sauvee, L. (2016). *The drivers for adoption of eco-innovation*. Journal of Cleaner Production. 113, 861-872.
7. Bourke, J., Roper, S. (2017). *Innovation, quality management and learning: Short-term and longer-term effects*. Research Policy. 46, 1505-1518.
8. Chin, W. W. (2010). *How to Write Up and Report PLS Analyses*. In: Esposito Vinzi, V., Chin, W.W., Henseler, J. and Wang, H., Eds., Handbook of Partial Least Squares: Concepts, Methods and Applications, Springer, Heidelberg, Dordrecht, London, New York, 655-690.
9. Darnall, N., Henriques, I., Sadorsky, P. (2010). *Adopting proactive environmental practices: The influence of stakeholders and firm size*. Journal of Management Studies. 47(6), 1072-1094.
10. Dong, Y., Wang, X., Jin, J., Qiao, Y., Shi, L. (2014). *Effects of eco-innovation typology on its performance: Empirical evidence from Chinese enterprises*. Journal of Engineering and Technology Management. 34, 78-98.

11. Donate, M. J., Sánchez de Pablo, J. D. (2015). *The role of knowledge-oriented leadership in knowledge management practices and innovation*. Journal of Business Research. 68, 360–370.
12. Frondel, M., Horbach, J., Rennings, K. (2007). *End-of-pipe or cleaner production? An empirical comparison of environmental innovation decisions across OECD countries*. Business Strategy and the Environment. 16, 571–584.
13. Fornell, C., & Larcker, D. F. (1981). *Evaluating structural equation models with unobservable variables and measurement error*. Journal of marketing research, 18(3), 39-50.
14. Hamdoun, M., Chiappetta Jabbour, C. J., Ben Othman, H. (2018). *Knowledge transfer and organizational innovation: Impacts of quality and environmental management*. Journal of Cleaner Production 193, 759–770.
15. Hair J. F., Jr., Black W. C., Babin B. J., Anderson R. E & Tatham R. L. (2010). *Multivariate data analysis*. New Jersey: Pearson Education.
16. Hulland (1999). *Use of partial least Science, Environment, Engineering and Technology*, Griffith University.
17. Jabbour, C. J. C., Jabbour, A.B.L.D.S., Govindan, K., Teixeira, A. A., Freitas, W.R.D.S., (2013). *Environmental management and operational performance in automotive companies in Brazil: the role of human resource management and lean manufacturing*. Journal of Cleaner Production. 47, 129-140.
18. Jackson, S. A., Gopalakrishna-Remani, V., Mishra, R., Napier, R. (2016). *Examining the impact of design for environment and the mediating effect of quality management innovation on firm performance*. International Journal of Production Economics. 173, 142-152.
19. Jimenez, D., Sanz-Valle, R. (2011). *Innovation, organizational learning, and performance*. Journal of Business Research, 64(4), 408-417
20. Kemp, R., Pontoglio, S. (2011). *The innovation effects of environmental policy instruments – A typical case of the blind men and the elephant?* Ecological Economics. 72, 28–36.
21. Li, D., Zhao, Y., Zhang, L., Chen, X., Cao, C. (2018). *Impact of quality management on green innovation*. Journal of Cleaner Production. 170, 462–470.
22. Liao, C. C., Wang, H. Y., Chuang, S. H., Shih, M. L., and Liu, C. C. (2010). *Enhancing knowledge management for Rand D innovation and firm performance: An integrative view*. African Journal of Business Management, 4, 3026-3038.
23. Lin, C. P. (2007). *To share or not to share: Modeling tacit knowledge sharing, its mediators and antecedents*. Journal of Business Ethics, 70, 411-428.
24. Liljander, V., Polsa, P., van Riel, A. (2009). *Modelling consumer responses to an apparel store brand: Store image as a risk reducer*. Journal of Retailing and Consumer Services, 16, 281-290.
25. Manders, B., De Vries, H. J., Blind, K. (2016). *ISO 9001 and product innovation: A literature review and research framework*. Technovation. 48-49, 41–55.
26. Mubako G., Rodgers W. Hall L. (2017). *Knowledge management: The effect of knowledge transfers on professional skepticism in audit engagement planning*. Computers in Human Behavior, 70, 564-574.
27. Musial, K., Budka, M., & Blysz, W. (2013). *Understanding the Other Side – The Inside Story of the INFER Project Innovation through Knowledge Transfer 2012* (pp.1-9): Springer.
28. Preacher., K. J, Leonardelli, G. J (2003). *Calculation for the Sobel test*. Available from URL: <http://www.psych.ku.edu/preacher/sobel/sobel.htm>. Retrieved on 29 February 2007.
29. Porter, M. E. (1991). *America's green strategy*. Scientific American. 264(4), 168.
30. Reverte, C., Eduardo, G. M., Cegarra-Navarro, J. G. (2016). *The influence of corporate social responsibility practices on organizational performance: evidence from Eco-Responsible Spanish firms*. Journal of Cleaner Production. 112, 2870–2884.

31. Su, Q., Li, Z., Zhang, S. X., Liu, Y. Y., Dang, J. X. (2008). *The impacts of quality management practices on business performance: An empirical investigation from China*. International Journal of Quality & Reliability Management. 25(8), 809-823.
32. Tenenhaus, M., Amatos, S., Esposito Vinzi, V. (2004). *A global goodness of fit index for PLS Structural equation modeling*, in Proceedings of the XLII SIS Scientific Meeting, 739-742.
33. Taminiou, Y., Smit, W., and DeLange, A. (2009). *Innovation in management consulting firms through informal knowledge sharing*. Journal of Knowledge Management, 13, 42-55.
34. Wetzels, M., G. Odekerken-Schroder, C. Van Oppen. (2009). *Using PLS path modeling for assessing hierarchical construct models: guidelines and empirical illustration*. Management Information Systems Quarterly 33(1): 11.
35. Weidenfeld, A., Williams, A. M., Butler, R. W. (2010). *Knowledge transfer and innovation among attractions*. Annals of Tourism Research. 37(3), 604–626.



**Zahra Sadat TAGHAVI** is currently pursuing a Master degree in Technology management at the Islamic Azad University. She graduated from Payame Noor University with a Bachelor's degree in Mathematics. Currently, she works as a bank clerk in Keshavarzi.



**Mehran KHALAJ** is an Assistant Professor of Industrial Engineering at the Islamic Azad University in Iran. He specializes in risk assessment and analysis. He has published many articles in prestigious scientific journals.



**Hossein AMOOZAD KHALILI** is Assistant Professor of Industrial Engineering, at the Islamic Azad University, Nowshahr Branch, Iran. He pursued his Bachelor, Master and PhD studies in Industrial Engineering. He specializes in system dynamics and transportation optimization and logistics. He is the author of several books. He has published numerous articles in prestigious journals and he has also carried out several research projects.