

# Empirical Study on the Effect of Organizational Culture on Organization Innovation

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## Abstract

The character of organizational innovation is considered significant for improving the products, procedures and bazaars for increasing the value as well as effectiveness of administrations. The innovation procedure is important to the performance of association as the capability for the innovation is important for obtaining and supporting competitive benefit. Few empirical investigations were conducted regarding the consequence of organizational culture on organizational innovation by Organizational Learning particularly over the developing countries. The most important objective of the current investigating is to evaluate the consequence of organizational culture on innovation directly and over Organizational Learning in Iranian automotive industry i.e. Iran Khodro Company. A total of 272 managers were nominated from systems and methods as the participants of the current the current investigation. The data were examined applying the Structural Equation Modelling (SEM). The results of the current investigation revealed that Organizational Learning has an important character as a mediator on the association between organizational culture and organizational innovation. In the current study, the one research model is suggested.

**Keywords:** organizational culture, organizational innovation, organizational learning

## 1. Introduction

Innovation refers to the economic development which could be considered as a source of sustained competitive advantage of the companies. Based on the managers' viewpoint, the main goal of innovation is to present change in the association for making new chances or achievement of the current ones. Additionally, innovation reforms the modest landscape and makes novel bazaar occasions. The innovation is considered important for the activities of organization as the capability to invent is important to obtain and sustain competitive advantage (McEvily & Chakravarthy, 2002). Current study focuses on the character of organizational category over that of innovation category for improving our information regarding the innovation in administrations. As the organization is considered as the initial setting for innovation, innovation cannot be investigated separately regarding the kind of organization which makes or adopts it (Damanpour et al., 2009). Consequently, innovation is identified in several manners. Though, it is identified as making the new information and concepts to improve novel business results for developing the internal business procedures and assemblies and to make market driven goods and service.

Although this concept seems to be very important, few studies have been conducted on the organization cultural (OC) barriers that might influence the association between organizational learning (OL) and organizational innovation (OI) results, and few studies were done on how cultural barriers affects the disposition of a company's current knowledge base and thus improves innovation. Considering the association between OL and innovation, it seems that innovation is significant as a basis of competitive advantage. Several investigations in this regard concluded that culture is an important issue for the OL procedure. Therefore, OC might improve learning or be a main barrier as it relies on the values it inspires (Liao & Wu, 2010).

According to the related literature, few studies were conducted in the automobile industry, in that there are merely a few investigations focused on the association between OC and OL (Azadi et al., 2013; Czerniewicz & Brown, 2009). Additionally, learning and OC are typically depends on societal and cultural circumstances. Furthermore, few investigations simultaneously inspect the consequence of several kinds of OC i.e. clan

adhocracy, hierarchy and market culture on OI through showing the mediating consequence of OL. Also, Liao and Wu (2010) proposed some variables which has been taken into account simultaneously and few comprehensive investigations evaluated that. Therefore, learning the connections between those variables in Iran Khodro could be considered as the contribution of fostering the innovation in that setting. Sanz-Valle et al., (2011) revealed that the association between OL and OI and recognizing that innovation is significant and is considered as the basis of competitive advantage. Therefore, for fostering OL and, consequently, innovation, businesses should try to make their managers ready for improving the OC, which fosters both, OL and OI. Current investigation tried to examine the following research questions:

- 1) Does the OC affect OI?
- 2) Is there any association between OC and OL?
- 3) Is OL holding any connectivity with OI?
- 4) Does the OL mediate the relationship between OC and OI?

## **2. Contribution of the Research**

OC as well as OL are considered as the key issues for developing an innovative work setting and association (Azadi et al., 2013; Czerniewicz & Brown, 2009). Consequently, to deliver a better definition about the association between OC and perceptions toward OI, current investigation attempted to evaluate the effect of several kinds of OC on OL. Additionally, the outcomes of the current study can aid us to obtain a truthful vision regarding the OC on the OL and OI, based on the introduction of the study and research purposes

### *2.1 Organization Culture*

OC is considered as a significant topic in university as well as commercial circumstances (Alvesson, 2012). The competing values outline was planned by Quinn and Rorbaugh (1983), to evaluate the culture of an association. It is recognized as one of the most significant business models through the 20<sup>th</sup> century. There is an agreement on the notion that administrations usually try to present a culture that inspires communication over their members and inspires workers to obtain an innovation and positive working situation. Current study uses a quantitative approach in the sociological-functionalist tradition through considering that organizations have cultures. Organizations with this culture apply observation and resistance to obtain advanced level of efficiency and competitiveness. Based on Cameron and Quinn (2006), OC is considered as the set of important standards, perceptions, and standards shared by supporters of an association. OC has two critically significant tasks to incorporate members, so that they distinguish how to tell to one another and to help the association for adopting the external circumstance. Investigations in this regard show that congruence between individual and OC helps to better steps of performance. Consequently, without a consistent change in OC, helps to shift an administration's consequences have a low chance of obtaining "enduring improvement in organizational performance"

### *2.2 Organization Learning*

The knowledge range i.e. OL refers to the organizational theory to understand theories and models about the way an association adapts and studies (Vasenska, 2013). OL is considered as one of the key equipment to obtain continuing achievement of an association (Argote, 2013; Easterby-Smith & Lyles, 2011; Liao & Wu, 2010). To improve its ability to learn, an association must create a system, in that individual learning might be shared amongst members as learning by a person shapes the foundation of OL; it is usually considered as individual teaching that an organization also learn as a whole. In organizational improvement, learning refers to the feature of an adaptive association, i.e., an association that is able to sense variations in signals from its setting (both internal and external) and adapt consequently (Smith et al., 2005). Based on Senge (1994), a learning organization is a place in that people frequently improve their aptitude to make the consequences they truthfully wish, where new and extensive patterns of thinking are nurtured, where collective aspiration is set free, and where people are frequently learning how to learn with each other.

### *2.3 Organization Innovation*

There is great arrangement that innovation is an essential capability for the future of any company and maybe an important issue of long term existence. Innovation might be considered as a swirl of novel ideas, novel procedure, and novel goods. It is clear that we need to know how each of these sides crops, procedures and thoughts interplay to retain businesses competitive in the future through improving economic value and the development of necessary in the market (Cooke, 2001; Marins, 2008). Innovation then is considered as an ongoing procedure of learning, searching and exploring that results in novel foodstuffs, novel methods, novel forms of

administrations and finally new marketplaces. Sustaining innovation is one of the most vexing difficulties faced in commercial (Amabile et al., 1996). Innovation is considered as one of those business issues which includes a huge field of investigating and still the usable consequences that a director might apply as a roadmap to obtain sustained innovation are deeply missing. Certainly, a critical issue in innovation, that of sense-making of novel thoughts, might be considered as the most critical reference issue for the people attracted in sustaining novelty. Innovation then is considered as an continuing procedure of acquiring, probing and investigating that ends in novel crops, novel methods, novel methods of administrations and finally novel marketplaces. There is a rising accord that OL is a an important strategic variable and one that drives novelty. OI is defined as the ideas' application that are supposed as new to an association, whether the novelty is signified in organisation, procedures, marketing systems, or crops (Weerawardena et al., 2006). It seems that the learning of organization is highly associated to OI. It is important to identify the kinds of innovation along with their features for the reason that a sure type of innovation wants unique and sophisticated replies from an association (Hurmelinna-Laukkanen et al., 2008).

In the current study, the knowledge-based theory is considered as an appropriate theory for supporting the conceptual framework. The knowledge based view (KBV) of an association focuses on the character of knowledge to identify and influence the performance. Current investigation improves empirical KBV investigation that inspects the performance suggestions of substitute organizational modes and offer support regarding the significance of organizational association in organization's knowledge improvement and incorporation events (Macher, 2014). Based on this theory, if OC considered as an immaterial advantage that is done efficiently in several levels of the association leads to some unique abilities and volumes that in turn lead to greater performance over innovation (Leal-Rodríguez et al., 2013).

#### 2.4 Research Model

This study attempts is to inspect the effect of OC over OI directly and over mediating variable OL. In the current investigation, a research model was shown and empirically examined. The KBV of company are examined as the chief theoretical framework for predicting and to interpreting the association between variables. Figures 1, 2 and 3 exemplify a model which contains three constructs, like, OC, OL, and OI.

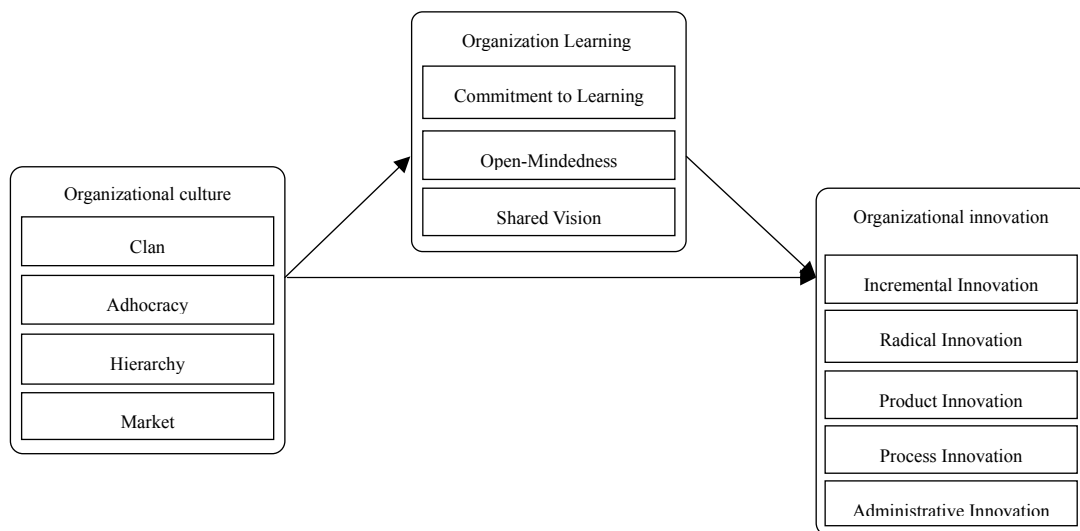


Figure 1. Conceptual framework

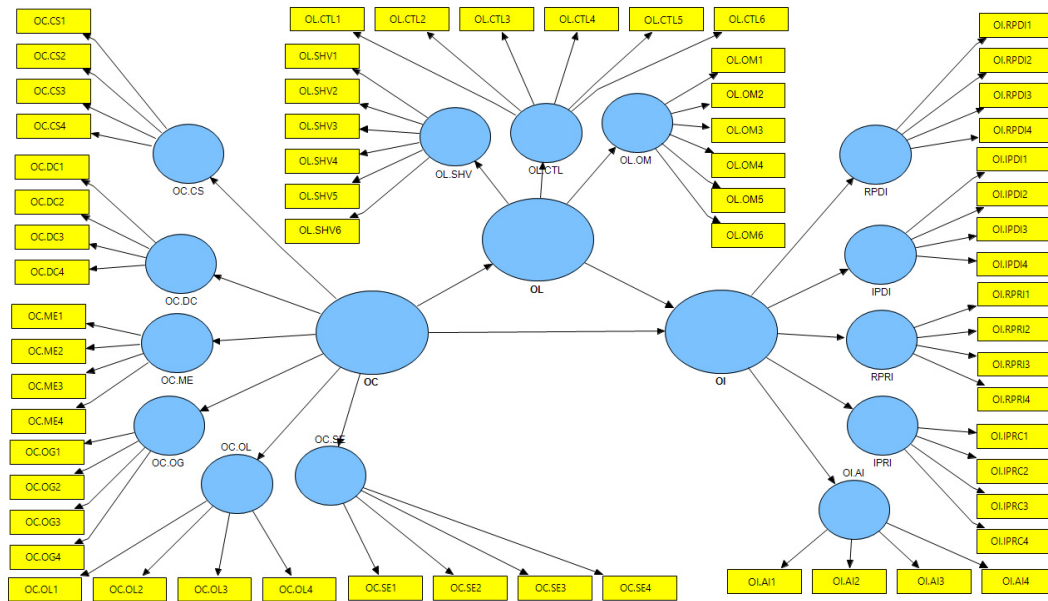


Figure 2. Detailed research model

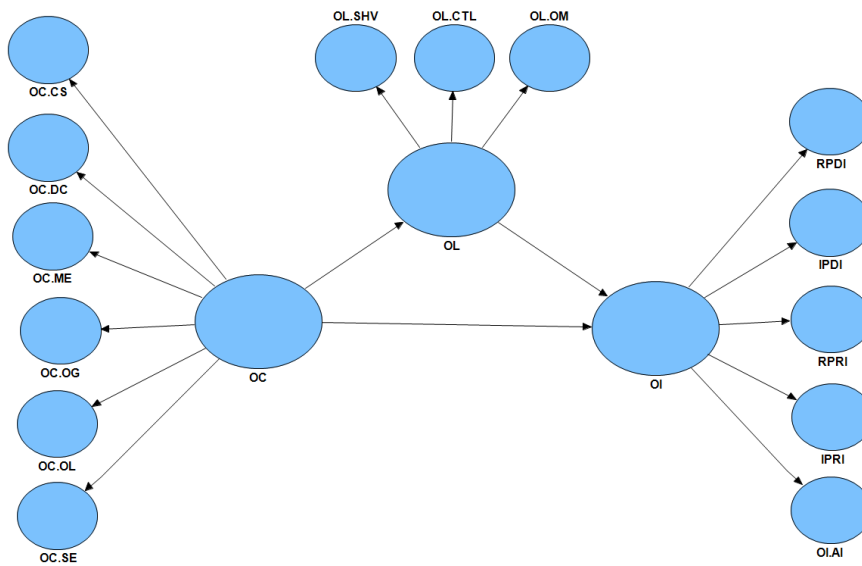


Figure 3. Detailed research model

According to the proposed conceptual framework, following four hypotheses have been employed.

- H<sub>1</sub>: OC has a positive effect on OI.
- H<sub>2</sub>: OC has a positive effect on OL.
- H<sub>3</sub>: OL has a positive effect on OI.
- H<sub>4</sub>: OL mediates the relationship between OC on OI.

**3. Methods**

The hypotheses of this paper have been developed with the help of supporting theory. This study chooses survey with questionnaire that allows hypothesis testing and generalizing findings. On the basis of previous empirical studies and literature review, questionnaire has been developed. Therefore, a questionnaire based survey was conducted to furnish ample evidence for potential moderating factors. This study can be classified as a cross-sectional study, since it measures the relationship between OL, OC and OI within a particular time period.

### 3.1 Sample

The target populations selected for this research is auto parts manufacturing of one of the largest car manufacturer company in Iran namely IKCO. According to the statistics of the company, 850 employees in the company that are classified in three groups namely, metallic, electrical and polymer are based on the requirements of automotive industry. As a result, the sampling frame for the current study includes a variety auto parts manufacturer. The systems and methods managers are surveyed as respondents. The minimum sample size using probability random sampling method is estimated to be 272 shown in Table 1.. Sample size was designed to be adequate to fulfil the Smart PLS analysis requirements. The stratified random sampling method was used for gathering quantitative data, because the stratifying criterion help researcher to be ensure that the resulting sample was distributed in the same way as the population (Bryman & Bell, 2007).

Table 1. Distribution of the sample size based on the size and type of industry

Sub-Sector	Frequency	Distribution of Sample frame based on the industry type and firm size			Sampling size
		Small	Medium	Large	
Electric	81	33	28	20	81
Metallic	114	45	41	28	114
Polymer	77	28	24	24	77
Total	272	108	92	72	272

### 3.2 Survey Procedure

An empirical study that is quantitative in nature was conducted in three different groups of Iranian auto parts manufacturers. In the present study, the survey questionnaire method for data collection is selected, which is defined as a predefined set of written closed structure or open-ended items filled by the respondents (Imran et al., 2011). The choice of data collection method in survey research is important because of the time, cost and quality of the collected data. A survey questionnaire is developed in this study following the steps of content and operational-items relevancy to the objective of the research, along with proper wording and layout management (Imran et al., 2011). Data were collected and analysed in two waves. The first was a pilot study performed to analyse the reliability and validity of newly developed measures. Factor analysis and Cronbach's  $\alpha$  results indicated acceptable validity and reliability of all study measures. Thus, the pilot study data were combined with the second wave of data, which was collected approximately 2 months after the pilot study data.

### 3.3 Measures

Except for demographic variables, Perceptual measures with a seven point Likert scale are used to measure response. All study items were assessed using 7-point Likert scales (e.g., strongly disagree 1, strongly agree 7).

#### 3.3.1 Measures-OC

Four distinct dimensions of OC were examined. These dimensions are: clan culture, adhocracy culture Hierarchy and market culture. However, in order to measure these four distinct dimensions, 6 constructs are conceptualized according to instrument (OCAI) developed by Cameron and Quinn (1999). These dimensions include: Dominant Characteristics, organizational leadership, management of employees, organizational glue, strategic emphases, and criteria for success. The scale includes a list of 24 items (4 questions for each of 6 dimensions). The measures are adopted and validated based on culture assessment instrument (OCAI) developed by Cameron and Quinn (1999).

#### 3.3.2 Measures-OI

The innovation process is essential to the performance of organization (Marins, 2008). In this study, Five distinct dimensions of OI were examined that namely radical product innovation, incremental product innovation, radical process innovation, incremental process innovation and administrative innovation (Cheng & Shiu, 2008). The scale includes a list of 20 items (4 questions for each of 5 dimensions).

#### 3.3.3 Measures-OL

Organizational learning is defined as the development of new knowledge or awareness that has potential to affect firm behaviour. Three dimensions of OL were examined. These dimensions are commitment to learning, shared

vision and open-mindedness (Tobin, 1993). The scale includes a list of 18 questions for assessing OL construct and (6 questions for each of 3 dimensions).

### *3.4 Limitations of the Methods*

Some important methodological limitations should be noted. For example, this study is cross-sectional in design, and therefore inferences of causality should be interpreted with caution. Future research might examine these relationships by employing experimental or longitudinal designs. In addition, the use of single-source data raises questions regarding common method bias. However, we employed multiple procedural remedies suggested by (Podsakoff & Organ, 1986) to limit this bias, including ensuring respondents' anonymity, randomizing the order of presentation of survey items as well as conducting a Harman's (1976) single-factor test to assess if any issue regarding common method bias exist.

Common method bias or common method variance refers to the circumstances where a single factor account for a majority of the variance, and a general factor would be apparent (Podsakoff & Organ, 1986). Common method variance may be of problem and this problem has its roots in the self-reported nature of the data. To remedy a problem of common method bias/variance, data needs to be tested using a Harman's (1976) single-factor test (Podsakoff & Organ, 1986). Harman's single-factor test involves analysing all variables in an exploratory factor analysis and examining the unrotated factor solution. Data were applied to IBM SPSS factor analysis procedure and this time only a single factor was extracted. The results shows that 19 Eigenvalues are above 1.0 and using principal axis factoring without rotation, the single forced factor accounts for only 24.24% of the overall variance. Since the percentage is below 50%, therefore, an existence of no general factor is evident and hence common method bias/variance is not an issue for further analysis in this study.

## **4. Results**

This study used a variance-based partial least squares (PLS) approach or so called partial least squares structural equation modelling (PLS-SEM) that is a second generation multivariate technique (Fornell & Cha, 1994). A software called Smart PLS M3 version 2.0 (Ringle et al., 2005) has been used for data analysis purposes. The reason to use PLS-SEM is based on the main aim of this study as to identify and investigate a model in which OI is explained by OC and learning. In circumstances where the focus is on overall prediction of a model, a prediction-oriented or variance-based PLS-SEM approach is particularly suitable (Henseler et al., 2012; Henseler et al., 2009). Furthermore, due to complexity of the model which could cause series of problem for covariance-based techniques, PLS-SEM approach has been employed in this study. In fact, PLS algorithm is established on a series of ordinary least squares regressions (OLS) whereby PLS-SEM as a robust technique can easily handle complex models and non-normally distributed data (Klarner et al., 2013). The analysis should be carried out on the basis of the path weighting scheme (Henseler et al., 2012; Henseler et al., 2009). This study uses recent guidelines provided by Chin (2010), Gil-Garcia (2008), and others (Hair et al., 2013; Hair et al., 2011; Hairet al., 2012, 2013; Hair et al., 2012; Hair et al., 2012).

PLS-SEM as a second generation multivariate technique (Fornell & Cha, 1994) is capable of carrying out a simultaneous evaluation of the measurement model (the relationships between constructs and their corresponding indicators), and the structural model with the aim of minimizing the error variance (Chin, 1998a; Gil-Garcia, 2008). As recommended by given authors, a measurement model analysis should be carried out prior to evaluation of a structural model. At this stage, the goodness of measures was established through convergence validity, discriminant validity, and composite reliability. Finally, a bootstrapping methods with 3,000 re-samples should be run to determine the significance levels for loadings, weights, and path coefficients (Chin, 1998b; Gil-Garcia, 2008).

### *4.1 Measurement Model*

Convergent validity: Convergent validity is the degree to which multiple items to measure the same concept are in agreement. As suggested by Hair et al. effect (2013) factor loadings, composite reliability and average variance extracted have been used to assess convergence validity. The recommended values for loadings are set at  $> 0.5$ , the average variance extracted (AVE) should be  $> 0.5$  and the composite reliability (CR) should be  $> 0.7$ . From Figure 3 it can be seen that all three constructs in the model are conceptualized as second order constructs. Thus this study followed the method suggested in the literature in PLS which is the repeated indicator approach to model the second order factors in the PLS analysis (Hair et al., 2013). From Table 2 Measurement Model, it can be seen that the results of the measurement model exceeded the recommended values thus indicating sufficient convergence validity. Hence, all items for given constructs have been remained in the model for further analysis except for Commitment to learning, Open Mindedness, Shared Vision. One item from each

commitment to learning and Shared Vision have been removed while two items was removed from open mindedness because of loading less than 0.7.

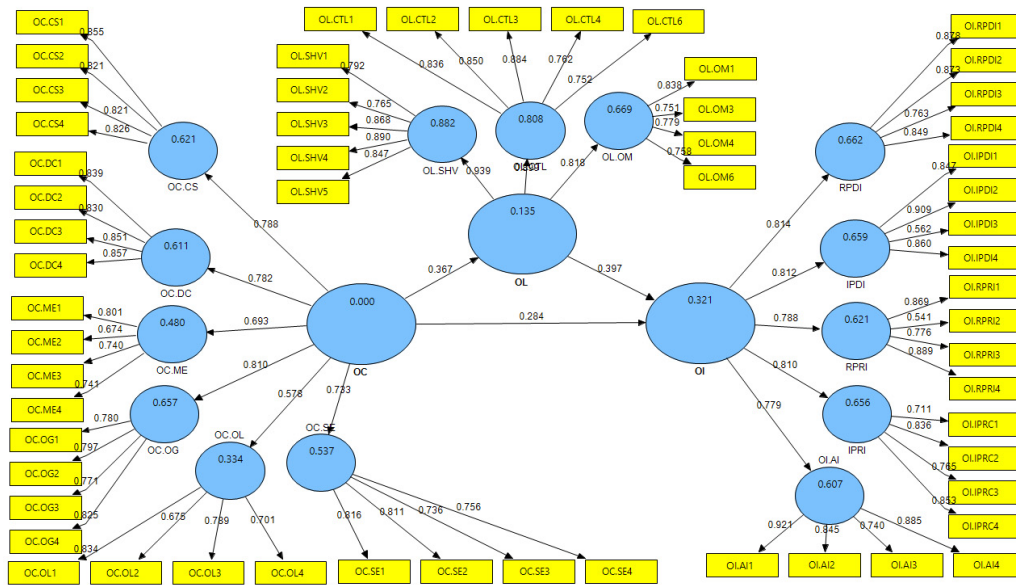


Figure 4. The result of measurement model

Table 2. Measurement model

First-Order Constructs	Second Order constructs	Items	Loadings	AVE <sup>a</sup>	CR <sup>b</sup>
OC: Criteria for Success	OC	OC.CS1	0.855	0.690	0.899
		OC.CS2	0.821		
		OC.CS3	0.821		
		OC.CS4	0.826		
OC: Dominant Characteristics	OC	OC.DC1	0.839	0.713	0.908
		OC.DC2	0.830		
		OC.DC3	0.851		
		OC.DC4	0.857		
OC: Management of Employees	OC	OC.ME1	0.801	0.548	0.829
		OC.ME2	0.674		
		OC.ME3	0.741		
		OC.ME4	0.740		
OC: Organization Glue	OC	OC.OL1	0.780	0.630	0.872
		OC.OL2	0.797		
		OC.OL3	0.771		
		OC.OL4	0.825		
OC: Organizational Leadership	OC	OC.OL1	0.834	0.566	0.838
		OC.OL2	0.674		
		OC.OL3	0.789		
		OC.OL4	0.701		
OC: Strategic Emphases	OC	OC.SE1	0.816	0.609	0.862
		OC.SE2	0.811		
		OC.SE3	0.736		
		OC.SE4	0.756		
OC <sup>c</sup>		Criteria for Success	0.788	0.54	0.874

First-Order Constructs	Second Order constructs	Items	Loadings	AVE <sup>a</sup>	CR <sup>b</sup>
		Dominant Characteristics	0.781		
		Management of Employees	0.693		
		Organization Glue	0.81		
		Organizational Leadership	0.577		
		Strategic Emphases	0.734		
OI: Administrative Innovation		OI.AI1	0.921	0.723	0.912
		OI.AI2	0.845		
		OI.AI3	0.740		
		OI.AI4	0.885		
OI: Incremental Product Innovation		OI.IPD11	0.847	0.650	0.878
		OI.IPD12	0.909		
		OI.IPD13	0.562		
		OI.IPD14	0.860		
OI: Incremental processes Innovation		OI.IPRC1	0.711	0.630	0.871
		OI.IPRC2	0.836		
		OI.IPRC3	0.765		
		OI.IPRC4	0.853		
OI: Radical Product innovation		OI.RPDI1	0.878	0.709	0.907
		OI.RPDI2	0.873		
		OI.RPDI3	0.763		
		OI.RPDI4	0.849		
OI: Radical Process Innovation		OI.RPRI1	0.869	0.610	0.859
		OI.RPRI2	0.541		
		OI.RPRI3	0.776		
		OI.RPRI4	0.889		
		Administrative Innovation	0.779	0.641	0.899
		Incremental Product Innovation	0.812		
OI <sup>c</sup>		Incremental processes Innovation	0.810		
		Radical Product innovation	0.814		
		Radical Process Innovation	0.789		
OL: Commitment to learning		OL.CTL1	0.836	0.670	0.910
		OL.CTL2	0.850		
		OL.CTL3	0.884		
		OL.CTL4	0.762		
		OL.CTL6	0.752		
OL: Open Mindedness		OL.OM1	0.838	0.612	0.863
		OL.OM3	0.751		
		OL.OM4	0.780		
		OL.OM6	0.759		
OL: Shared Vision		OL.SHV1	0.792	0.695	0.919
		OL.SHV2	0.765		
		OL.SHV3	0.868		



First-Order Constructs	Second Order constructs	Items	Loadings	AVE <sup>a</sup>	CR <sup>b</sup>
OL <sup>c</sup>		OL.SHV4	0.890	0.787	0.917
		OL.SHV5	0.847		
		Commitment to learning	0.899		
		Open Mindedness	0.819		
		Shared Vision	0.939		

Discriminant validity: Discriminant validity has been assessed using the Fornell and Larcker (1981) method. Discriminant validity is the degree to which items differentiate among constructs or measure distinct concepts (Fornell & Larcker, 1981). The criterion used to assess this is by comparing the AVE with the squared correlations or the square root of the AVE with correlations. The criterion used to assess this is by comparing the AVE with the squared correlations or the square root of the AVE with correlations. As shown in Table 2, the study uses second method which is to compare the square root of the AVE with the correlations. The criteria is that if the square root of the AVE, shown in the diagonals are greater than the values in the row and columns on that particular construct than we can conclude that the measures discriminant. Table 1.3 shows that the values in the diagonals are greater than the values in their respective row and column thus indicating the measures used in this study are distinct. Thus, the results presented in Tables 3 demonstrate an adequate discriminant and convergent validity.

Table 3. Discriminant validity

Constructs	1	2	3
1. OC	<b>0.735</b>		
2. OI	0.430	<b>0.801</b>	
3. OL	0.367	0.501	<b>0.887</b>

\*Note. Diagonals represent the square root of the AVE while the off-diagonals represent the correlations.

\*The criteria are that the correlation for each variable should be less than square root of AVE presented on diagonals.

#### 4.2 Structural Model

To evaluate the structural models' predictive power, R squares ( $R^2$ ) were calculated. R squares ( $R^2$ ) indicates the amount of variance explained by the exogenous variables (Barclay et al., 1995). All two variables together explained 32.1% of the variance in OI. Using a bootstrapping technique with a re-sampling of 3000, the path estimates and t-statistics were calculated for the hypothesized relationships. Figure 4 shows the structural model analysis. From the analysis it was found OC ( $\beta = 0.367$ ,  $p < 0.01$ ) has a positive significant effect on OL while OC ( $\beta = 0.284$ ,  $p < 0.01$ ) has a positive significant effect on OI. OL ( $\beta = 0.397$ ,  $p < 0.01$ ) has a positive significant effect on OI as shown in Table 4. Thus, all the hypotheses are supported. The result of mediation analysis is reported in the next section.

Table 4. Hypothesis testing-direct relationships

Hypothesis	Relationship	Beta	Std Error	t-Value	Supported
H1	OC→OI	0.284***	0.060	4.717	Yes
H2	OC→OL	0.367***	0.060	6.136	Yes
H3	OL→OI	0.397***	0.054	7.349	Yes
		OI		OL	
	R <sup>2</sup> Squares for endogenous variables	0.321 32.1%		0.135 or 13.5%	

OC=organizational culture; OI=organizational innovation; & OL=organizational learning.

Note: For a 1-tailed hypothesis: \* $p < 0.1$  ( $t > 1.28$ ), \*\* $p < 0.05$  ( $t > 1.645$ ), and \*\*\* $p < 0.01$  ( $t > 2.33$ ), while For a 2-tailed hypothesis: \* $p < 0.1$  ( $t > 1.645$ ), \*\* $p < 0.05$  ( $t > 1.96$ ), and \*\*\* $p < 0.01$  ( $t > 2.58$ ).

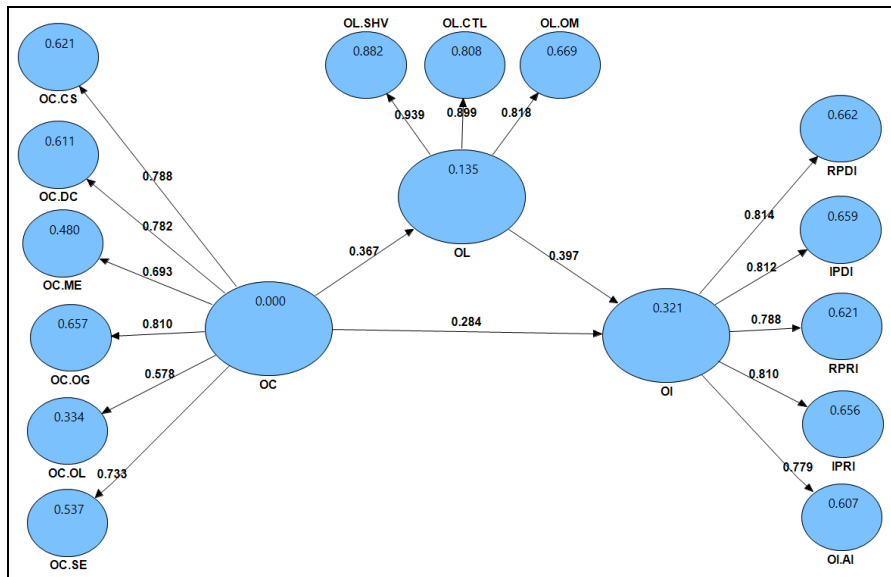


Figure 5. The result of structural model

4.3 Mediation Analysis

In order to carry out the mediation analysis, this study adopted the perspective Bollen (1989) articulated and therefore, any evidence of a simple association between X and Y is not a precondition of a mediation analysis (as it had been considered as a precondition of mediation analysis by Baron and Kenny (1986)). Therefore, this study follows the most contemporary approach of mediation analysis that is based on Bollen (1989). In given mediation system as a causal system, one causal antecedent X (OC) is proposed as influencing the outcome variable Y (OI) through one intervening variable M (OL). The total effect of X on Y is partitioned into direct and indirect components. Path from X (OC) to Y (OI) without passing from M (OL) is called direct effect and is symbolized as (c'). The other paths from X (OC) to Y (OI) which pass through are M (OL) is called indirect effects. Indirect effect of X on Y through M only is symbolized as ab. The indirect effect represents how X (OC) through a causal sequence influence Y (OI) where X (OC) influence M (OL), which in turn M (OL) influence Y (OI). The indirect effect passes from antecedent X (OC) to consequent M (OL) and then from antecedent M (OL) to consequent Y (OI) whose coefficient has been symbolized as a\*b and calculated as a product of a\* b.

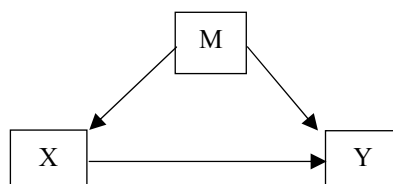


Figure 6. Conceptual diagram-the simple mediation model

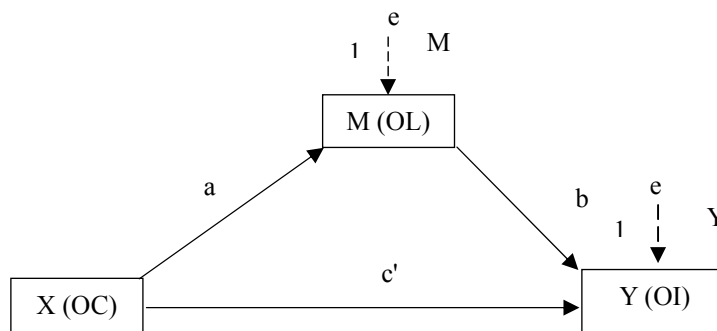


Figure 7. Statistical diagram the simple mediation model

Indirect effect of X on Y through M = a\*b; Direct effect of X on Y = c'; In this case: X = OC, Y = OI, and M = OL.

The first step was to use the latent variable scores (unstandardized) subsequent to measurement model analysis to calculate total, direct and indirect effects, as well as the 95% confidence interval (CI) for the mediator variables as shown in Table 5 and Table 6. Next, a bootstrapping procedure (re-sample N=10,000) has been run to assess if product of coefficients, which represents the indirect effect, is significant (Hayes, 2013). This step was carried out to obtain bootstrap confidence intervals: bias-corrected (BC). As the result, if the computed interval for a mediating effect does not contain zero, this means that the indirect effect is significantly different from zero with a 95% confidence level. In this procedure, a t-value or Z scores are calculated as:  $Z=ab/(Se(ab))$ .

The results of bootstrapping procedure are presented in following tables. Results suggest that indirect effect is significant. The results demonstrates that the direct of OC on OI or c' path is significant ( $B=0.299$ ,  $\alpha = 0.000 < p = 0.01$ ). The effect of all other coefficient paths in the model is significant. Besides, as suggested by Taylor, MacKinnon and Tein, (2008), the ratio of indirect ( $I=a*b$ ) to direct effect ( $c'$ ), and indirect effect ( $I=a*b$ ) to total effect ( $c = c' + a*b$ ) can be calculated as I/D and I/D+I respectively. As suggested by Hair et al. (2013), another criterion to reject or accept a mediating hypotheses depends on the size of the ratio of the indirect effect to the total effect: I/D+I, or  $(a*b)/(c = c' + a*b)$ . This measure is called Variance accounted for ( $VAF=ab/(c'+a*b)$ ) and determines the size of indirect effect in relation to total effect (Hair et al., 2013). For OL as the mediator, the ratio of indirect to direct effect ( $0.1521/0.299$ ) equals to 50.8% and the proportion of indirect effect to the total effect is  $(0.1521/(0.1521 + 0.299) = 33.7\%)$  as shown Table 7. Hence, given the VAF measure, it has been supported that: OL mediates the relationship between OC on OI as shown Table 8. To support the findings, a normal theory test or Sobel (1982) z-test for indirect effects has been carried out using bootstrapping technique to avoid violation of distribution assumption. A bootstrapping technique reduced the risk of facing the indirect effects which are usually positively skewed and kurtosis. The results of normal theory tests or Sobel (1982) z-test is almost identical to procedure where the mediating effect for OL is evident. A normal theory test has also yielded the same coefficients for OL.

Table 5. Direct and total effects (N=279)

Relationships	Coefficient (Unstandardized)	Std. Error (SE)	t	p	Significant effect/path
IV to Mediators (a path)					
OC→OL	0.484	0.074	6.50	0.000	Exist
Direct Effects of Mediators on DV (b path)					
OL→OI	.313	.0425	7.311	0.000	Exist
Total Effect of IV on DV (c path)					
OC→OI	0.451	0.057	7.84	0.000	Exist
Direct Effect of IV on DV (c' path)					
OC→OI	0.299	0.056	5.290s	0.000	Exist
Model Summary for DV Model:					
F (2,276) = 64.027, $\alpha = 0.000 < p = 0.01$					
R-Square: 0.3169					
Adjusted R-Square: 0.3120					

Table 6. Normal theory tests for indirect effects (N=279)

Indirect effect	Effect	(SE)	Z	p	Mediation
OC→OL→OI	0.1521	0.0301	4.895	0.000	Exist

Table 7. Bootstrapping results for indirect effects-mediation analysis (N=279)

Indirect effect	Beta (a*b) Boot	SE	I/D ab/c'	I/D+I ab/c	Bootstrapping Confidence Intervals	95%	Mediating effect exist
OC→OL→OI	0.1521	0.034	50.8%	33.7%	0.091	0.228	Yes

Note. The variance accounted for (VAF) determines the size of the indirect effect in relation to the total effect (D+I):  $VAF > 80\% =$  Large Effect and full Mediation,  $80\% > VAF > 20\% =$  Partial Mediation,  $VAF < 20\% =$  almost there is no mediation.

See Hayes, A. F. (2009). *Beyond Baron and Kenny: Statistical mediation analysis in the new millennium*. Communication Monographs, 76, 408-420, Or Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: The Guilford Press

Table 8. Summary of mediation hypotheses

N	Relationship	Hypothesis statement	Decision
H4	OC→OL→OI	OL mediates the relationship between OC on OI.	Supported

## 5. Discussion

Four hypotheses were proposed/hypothesized to test for the direct effect of antecedents on consequent variables/constructs. In terms of the antecedents of OI (the phenomenon of interest of current study), OL demonstrated the highest coefficients (Beta = 0.397). In other words, in a linear combination of OC and OL to predict the variations in OI, OL contributes the most to the variation in OI with a medium to large effect size. OC is a significant predictor of OL. Therefore, much attention needs to be paid on enhancing OC. In other words, although innovation is determined/depend on learning (OL) in an organization, an improvement in culture (OC) can considerably/saliently improve innovation (OI) as well as learning (OL). From a practical point of view this means that if a manager is interested to increase the innovation (perception of innovation) in an organization, he/she would better to pay a substantial attention to learning (OL) in given organization. Besides, the effect/impact of organization culture on variation of organization innovation is substantial. Therefore, a policy that seeks to improve the OI needs to introduce a combination of OL and culture practices.

Further, the partial regression coefficients in the model have different interpretations. For OC, two organizations which are equal in OL but differ one unit in their OC practices are estimated to differ by 0.284 units in practicing of innovation in their organization. And eventually, in terms of the positive effect of OC on OL, two organizations differ one unit in their OC practices are estimated to differ by 0.367 units in OL in their organization.

Another part of findings of structural model concerns the R squares as the capability of the overall model to predict the phenomenon of interest. The R squares calculated for OI equals to  $R^2 = 0.321$  or 32.1% which according to Cohen's table of population effect size and given formula,  $f^2 = R^2 / (1 - R^2)$ , is large. Effect size (ES) is the degree to which  $H_0$  is false is indexed by the discrepancy between  $H_0$  and  $H_1$ . In other words, a large ES increase the confidence that the significant finding is not spurious. The large effect size of R squares supported the significant tests and proved that a linear combination of all variables in the model is significantly and sufficiently predicting the phenomenon of interest (OI). In other words, the result of measurement model proved that the model is valid and reliable while the results of structural model proved that the model is authentic. However, another 67.9% (100 -32.1) of variation in OI has been remained unexplained in this model and therefore, further study is needed to find the other necessary variables.

## 6. Conclusion

This study inspects the associations between OC, OI and OL. The result of this study discloses that OC exerts a comprehensive mediating impact over OI by means of organization learning. Conversely, members in organizations with vast experience and OC may improve the organizational performance. On the basis of this study, it is comprehensible that OC plays an important part in innovation. It is considerable for professionals of both OC and innovation to comprehend the systemic correlation among these conceptions and the significance that it is able to generate given that producing and sustaining competitive advantage in favour of organizations.

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