International Journal on Emerging Technologies **10**(1a): 66-76(2019)

ISSN No. (Print): 0975-8364
ISSN No. (Online): 2249-3255

Effect of Transformational Leadership on Intellectual Capital and Organizational Innovation

Saif Alshamsi, Osama Isaac, and Amya Bhaumik
Faculty of Business and Accountancy,
Lincoln University College (LUC), Selangor, Malaysia

(Corresponding author: Saif Alshamsi)
(Received 02 March 2019, Revised 18 May 2019, Accepted 23 May 2019)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: This research analyzes the moderating role of transformational leadership and the direct impact of the intellectual capital on the organizational innovation within Abu Dhabi police department in the UAE. This study employs quantitative data, a questionnaire that is used to compute the main construct values for the proposed research model in the present study. The data valid for the analysis are 393 cases. SEM-VB was implemented along with SmartPLS 3.0 software to evaluate the efficacy of the proposed research model in this present research. Result from the analysis shed lights on the impact of intellectual capital on the organizational innovation by testing the impact of human, relational, and organizational investments done on varied innovations. Moreover, an indirect impact was observed due to the moderation of transformational leadership. The proposed research model explained 60% of the organizational innovation (OI), and all the tested factors exhibited a positive direct effect on the OI within the UAE-based public sectors. The results of the current study have the potential to give further insights into innovation of organizations strategies and the moderation role of transformational leadership.

Keywords: Intellectual capital; organizational innovation; transformational leadership.

I. INTRODUCTION

Even though intellectual capital (IC)might be competitive advantage's source, in general, few institutions fail to apprehend its real meaning. Although, one of the first organizations that Skandia was the only institution that had reported about its non-physical possessions. Since then, this phenomenon has been explored with numerous academic researchers and publications.

The organizational performance had ascended due to the developments in technology, novelty creations, and human qualities, as well as both rational and structural elements. Investments in the fields of general awareness, education, R&D also influence the organizational performances. The organizational innovation in the 21st century requires intellectual capital management. IC is considered as one of the crucial element of the innovation performance, as well as a strategic element for an organization. When used with its optimum efficiency, it can result in reducing the resource consumption as well as the organizational innovation stage. Prior research works have already discussed about the positive bonding between IC and organizational performance. In addition to it, many have highlighted about the relation between IC and innovation varies with varied factors [1,2]. Hence, the present study investigates about both the mediating and moderating elements between organizational innovation and IC to study this variation in their relationship.

Prior studies have highlighted that 'leadership' poses as a vital point in the behavior of innovation. Moreover, 'transformational leadership' is referred as one of the crucial elements in the promotion of the innovation. It basically enhances the working ability of the organizational staffs leading to innovation in behavior. The proper apprehension of the relation between IC and organizational innovation remains in its early stage as 'transformational leadership' acts as a moderating element.

UAE is termed as one of the top-rated countries in the region in term of competitiveness, that also one of the countries need to be extending and studying the impact of the intellectual capital on the innovation of organization. Organizational innovation is the implementations of a new organizational method in the undertaking business practices, workplace organization or external relations to improve the use of knowledge, and quality of goods and services. The UAE ranks 15 among 137 countries which were included in the Global Competitiveness Report (2018) (see figure 1). Comparing to the neighboring countries the UAE is running ahead all the gulf countries and neighboring Arab countries where Oman for instance comes in 76 position and Kuwait ranks 103 among 137 countries that were included in the report. While Algeria and Egypt rank 104 and 109. Which indicates that the UAE utilize the intellectual property to implement new organizational methods and practices to keep up within the range of competitiveness and improve goods and services provided by the business.

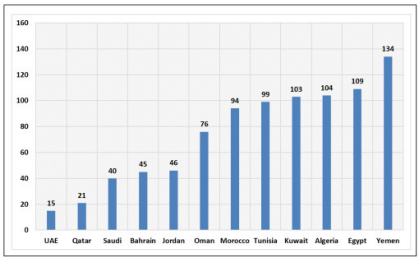


Fig. 1. Organizational innovation ranking in UAE compare to neighbouring (ranking among 137 countries).

One of the pillars of the UAE Vision 2021is transforming the UAE into competitive Knowledge economy (innovation, creativity, and financial

services). Thus, to reach that point of organizational innovation, intellectual capital is a driver for reaching that goal. Human, relational, and structural capitals are direct contributors into the organizational innovation. Moreover, transformational leadership is being increasingly investigated in the academic literature as an important factor in today's world that will lead to organizational innovation. Thus, in this study transformational leadership will be examined as a moderating variable between intellectual capital (Human, Relational, and Structural) and the organizational innovation. Furthermore, this study is one of the first, to the best of the researcher's knowledge to study the effect of intellectual capital on the organizational innovation and also to test the moderation effect of transformational leadership between them in the UAE.

II. REVIEW OF PRIOR STUDIES

A. Organizational Innovation (OI)

Innovation can be defined in varied ways. As per few studies, innovation aids in creating new and innovative ideas or products because of the different kind of visualizations of the creator. The diffusion of innovation is also a concept that is discussed in varied studies, which emphasizes on spreading the idea of innovation via varied channels among the denizens of the societal system. However, few have also highlighted that creativity and innovation are different in terms of the generation of new thoughts. Hence, creativity is termed as a constituent of innovation [3-5]. Even though there is a remarkable difference between the features of services and goods, the concepts and theories of innovation, based on the assimilation method, can be transferred from the production to the service sector. Hence, the research model used in the production sector has been proposed to evaluate the features of the service sectors.

There is a need to examine the factors of the study that affecting the organizational innovation. This is the performance of organization is influenced by many factors which include the collaboration of the organizational resources or assets that emerge as the source of competitive advantage for the performance of organization. Organizational innovation can be a result of sharing valuable knowledge, the networking or relationship within and outside the organizations, which gives the organizations an opportunity to succeed in the global competing economy. Moreover, researchers believed that, intellectual capital is positively related to the organizational innovation.

B. Intellectual Capital (IC)

IC can described as the total stocks of the collective knowledge, information, technologies, intellectual property rights, experience, organization learning and competence, team communication systems, customer relations, and brands that are able to create values for a firm. IC acts as the intangible assets of varied institutions in terms of their organizational innovation related benefits [6]. Basically, these intangible assets aid an organization by posing as the IC that supports the sustenance of a new business and organizational values [7]. It is an important element that helps an employee to attain his/her goal in his career in a certain institution. It is also highlighted in previous researches that IC accumulation helps in improving the organizational outcomes. Moreover, successful and innovated products act as a threshold for an organization's benefits [6].

Human Capital (HC). HC can be defined as the proficiencies (like skills, knowledge, education, qualifications, and experiences) exhibited by the employees of an organization. Basically, an organization can possess this form of capital by burrowing it or taking it on rent basis. Herein, the main focus is to analyze the methods that can be utilized to possess more HC for the development of the company in whatever form of surroundings.

Many studies have highlighted that the employees should be referred as an asset for the organizational performance or innovation. It is a crucial and valuable element in accomplishing valuable benefits in performance and competitiveness. Hence, an institute should think of investing on HC with an intention to enhance the knowledge and skill, thereby enhancing the gross performance of both organizations and employees.

Hence, H1.Human capital significantly has a positive impact on organizational innovation.

Relational Capital (RC). RC can be defined as the bonding between the organization (internal) and customer (external) [8]. It is something that is related to the informal form of communication [9]. RC is resulted from the interactive communication in between the employees in a organization by sharing their experiences and knowledge among themselves. IC increases with increase in the level of the RC as it make an employee capable of executing difficult tasks with much ease. Hence, it is hypothesized that the relation between the external stakeholders and the employees of an organization leads to new innovations.

Hence, H2: Relational capital significantly has a positive impact on organizational innovation.

Structural Capital (SC)

SC can be defined as the elements that comprise the factors behind the wealth generation of an organization due to the effort given by its employees. Basically, it can be denoted as each and everything that aids in enhancing the employees efficiency. Many studies have highlighted that there is a profound relation between SC and innovation, i.e, the more the SC is, more is the innovation level. Prior studies have also pointed out that technology and organizational climate plays an important role in strengthening the innovation section of an institution.

In simple words, it can also be said that SC acts as a vital element in the intellectual capital of an organization. It is thus hypothesized that the organizational innovation is directly affected by SC as it enhances the general awareness of an employee.

H3. Structural capital significantly has a positive impact on organizational innovation.

C. Transformational Leadership (TL)

TL can be defined as the combined effect of charisma, individual consideration, intellectual stimulation, and inspirational motivation to develop awareness about the internal as well as external problems of an organization. It also motivate it's followers to discover new methods of improving their performances.

Previous studies have discussed about the importance of leadership in UAE-based organization that aid in leading employees and inspiring them to a greater extent. Hence, it is hypothesized that TL

shows a direct and positive impact on HC, RC, and SC.

H4. Transformational leadership strengthens the positive effect of the human capital on organizational innovation.

H5. Transformational leadership strengthens the positive effect of the relational capital on organizational innovation.

H6. Transformational leadership strengthens the positive effect of the structural capital on organizational innovation.

III. RESEARCHMETHOD

A. Proposed Model

Wu et al. [10] has concluded that IC is capable of supporting the innovation part of the firm. It was also stated that IC can exhibit positive impact on the performance level of the new developments in the manufacturing section. Researchers have also emphasized on intellectual capital can impact positively on the performance of new product development. Based on the resource based view and resource dependence theory, this study built the main relationship between intellectual capital (HC, SC, RC) and organizational innovation. Moreover, based on the previous literature, this study evaluated the influence of the TL on the relation between IC and organizational innovation in a moderating manner (H4, H5, and H6). Thus, with the consideration of all the above, the research framework was developed (Fig 2).

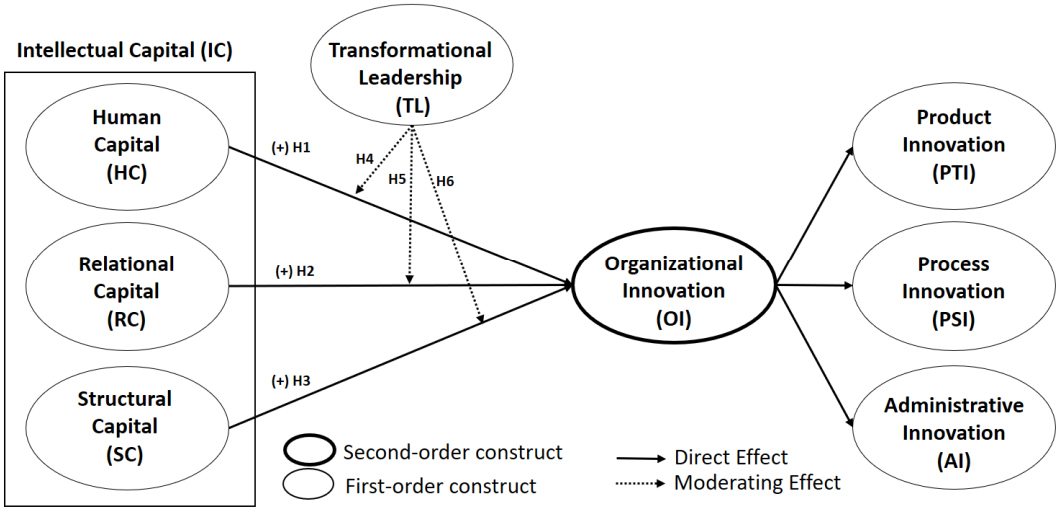


Fig. 2. The proposed model.

B. Development of Instrument

A close-ended questionnaire was developed to analyze the variables of the present study model. It was further translated to Arabic for the UAE residents and the responses were back-translated for further analysis. The analysis was divided into two parts, one as per the Likert scale (Appendix A) and another one was based on the demographic details of the respondents.

C. Data Collection

The present research work was conducted at the Abu Dhabi police department in UAE, where the questionnaires were distributed. They were asked to share their views through the questionnaire answers. Out of 700 questions, 452 (64.75%) were answered and 393 were filtered out in total for further analysis. Owing to these response rates, the SEM-PLS was applied with more confidence.

IV. STUDY OF DATA AND ITS FINDINGS

The research model of the current study was assessed by using PLS SEM-VB and SmartPLS 3.0 software [11]. The elaborative evaluation led to the implementation of a two-step of analytical methodology, i.e. structural (to test the relationship hypotheses) and measurement (to test the validity and reliability) models of assessment. This two-step analysis model is superior in comparison to the one-step assessment methodology [12,13]. The first model measures the parameters of the structural model, whereas the later one records each constructs measurement.

PLS technique is utilized in the current study for its analytical skills to deduce clear evaluations [14]. On the other hand, SEM is implemented to conduct a coinciding strategical evaluation of the data for precise calculations [15].

A. Descriptive analysis

The mean and SD of the study variables are presented in Table 1. The measurement was in accordance with Likert's scale with variables that are significant ($p < 0.01$). Human capital recorded a mean score of 3.090 out of 5.0 points with a standard deviation of 0.978, indicating that the respondents agreed that their organizations have knowledgeable employees, creative employees, and highly skilled employees. Relational capital recorded a mean score of 3.248 out of 5.0 points with a standard deviation of 1.063, indicating that the respondents agreed that their organizations have a close relationship with our customers, suppliers, and partners. Structural capital recorded a mean score of 3.130 out of 5.0 points with a standard deviation of 1.012, indicating that the respondents agreed that the overall operations procedure of their organization is efficient, responds to changes very quickly, easily accessible information system, support innovation, and organization's culture and atmosphere are flexible, comfortable, and supportive. Product innovation recorded a mean score

of 3.434 out of 5.0 points with a standard deviation of 1.153, indicating that the respondents agreed that in their organization, always develop new product and services, introduce and diversify our product to suit customer needs, and try applying new idea/technology at our organization. Process innovation recorded a mean score of 3.410 out of 5.0 points with a standard deviation of 1.142, indicating that the respondents agreed that in their organization new technology is adapted for improving the work processes, try new methods for improving processes, and quick to respond to changing needs of its customer. Administrative innovation recorded a mean score of 3.381 out of 5.0 points with a standard deviation of 0.936, indicating that the respondents agreed that administrative support is always there for employees, employees compensation system is linked to performance, the organization has a new and improved performance evaluation system, employees believe in the open communication environment, and employees are hired on their creativity. Transformational leadership recorded a mean score of 3.091 out of 5.0 points with a standard deviation of 0.989, indicating that the respondents agreed that their leaders help them develop our potential and strengths, spend time teaching and coaching, talk optimistically about the future of the organization, suggest some new ways for us to solve the problems, enable them to think about old problems in new ways, provide recognition/rewards when they reach our goals, and express with a few simple words what they could and should do.

B. Measurement Model Assessment

Construct reliability and validity (consisting of convergent and discriminant validity) were utilized to test the measurement model. The individual Cronbach's alpha coefficients were examined to ascertain the reliability of each core variable in the measurement model (construct reliability). The values of all the individual Cronbach's alpha coefficients in this study were between 0.900 to 0.955, which exceeded the suggested value of 0.7[16]. Furthermore, for testing construct reliability, the values of all the composite reliability (CR) were between 0.938 to 0.967, which exceeded 0.7[17-19]. Thus, construct reliability is satisfied as Cronbach's Alpha and is found to be error-free for all constructs (Table 1).

Assessment of Indicator reliability was done by using factor loadings. When the associated indicators have much in common, this is captured in the construct and indicated by high loadings on the construct [20]. According to Hair *et al.* [13], values exceeding 0.50 indicate significant factor loadings. Table 1 shows that all items in this study had factor loadings higher than the recommended value of 0.5 except for items AI5 and TL7 which was eliminated from the scale due to low loadings.

Table 1: Physical measurements of all constructs.

Constructs	Item	Loading (> 0.5)	M	SD	α (> 0.7)	CR (> 0.7)	AVE (> 0.5)
Human Capital (HC)	HC1 HC2 HC3	0.888 0.939 0.912	3.090	0.978	0.900	0.938	0.834
Relational Capital (RC)	RC1 RC2 RC3	0.920 0.917 0.923	3.248	1.063	0.909	0.943	0.846
Structural Capital (SC)	SC1 SC2 SC3 SC4 SC5 SC6	0.875 0.883 0.888 0.887 0.898 0.890	3.130	1.012	0.946	0.957	0.786
Product Innovation (PTI)	PTI1 PTI2 PTI3	0.960 0.961 0.933	3.434	1.153	0.948	0.966	0.905
Process Innovation (PSI)	PSI1 PSI2 PSI3	0.953 0.941 0.946	3.410	1.142	0.942	0.963	0.896
Administrative Innovation (AI)	AI1 AI2 AI3 AI4 AI5	0.945 0.938 0.936 0.937 Deleted	3.381	0.936	0.955	0.967	0.881
Transformational Leadership (TL)	TL1 TL2 TL3 TL4 TL5 TL6 TL7	0.784 0.841 0.873 0.826 0.941 0.934 Deleted	3.091	0.989	0.934	0.948	0.754

Note: M=Mean; SD=Standard Deviation, α= Cronbach's alpha; CR = Composite Reliability, AVE = Average Variance Extracted.

- The measurement is as per the Likert's scale with variables that are significant with $p < 0.01$, excluding AI5 and TL7 items.

AVE was assess to analyze the Convergent Validity. It is reported that this validity shows a positive correlation with the alternate values of the same variables. The AVE values range within 0.754 to 0.905 that is more than 0.50 [13]. The convergent validity has been achieved by all the construct variables in this study (Table 1).

Discriminant validity, Heterotrait-monotrait ratio (HTMT), Fornell-Larcker, and Cross-loadings were applied to analyze the measurement model. Usually, cross-loadings are used as the first step in testing discriminant validity of the indicators [20]. The cross loading parameters have satisfied all the requirements in the present study as denoted in Table 2. In this study, the indicators' outer loadings on a construct exceeded all its cross-loadings with other constructs, and hence, the cross loading criterion had satisfied the requirements (refer to Table 2).

Table 2: Discriminant validity of the study outcomes by the cross loading.

	HC	RC	SC	TL	PTI	PSI	AI
HC1	**0.888**	0.404	0.313	-0.580	0.402	0.414	0.368
HC2	**0.939**	0.429	0.379	-0.584	0.487	0.458	0.463
HC3	**0.912**	0.449	0.385	-0.542	0.463	0.442	0.460
RC1	0.439	**0.920**	0.555	-0.415	0.600	0.595	0.519
RC2	0.411	**0.917**	0.537	-0.349	0.593	0.549	0.499
RC3	0.443	**0.923**	0.544	-0.366	0.572	0.543	0.518
SC1	0.360	0.530	**0.875**	-0.320	0.506	0.478	0.457
SC2	0.361	0.537	**0.883**	-0.356	0.513	0.516	0.452
SC3	0.350	0.527	**0.888**	-0.323	0.521	0.500	0.473
SC4	0.332	0.527	**0.887**	-0.293	0.478	0.475	0.458
SC5	0.352	0.522	**0.898**	-0.279	0.536	0.503	0.504
SC6	0.348	0.513	**0.890**	-0.257	0.524	0.506	0.513
TL1	-0.483	-0.340	-0.283	**0.784**	-0.262	-0.296	-0.251
TL2	-0.528	-0.364	-0.312	**0.841**	-0.360	-0.361	-0.305
TL3	-0.543	-0.340	-0.262	**0.873**	-0.291	-0.348	-0.258
TL4	-0.534	-0.384	-0.350	**0.826**	-0.371	-0.408	-0.302
TL5	-0.578	-0.362	-0.285	**0.941**	-0.348	-0.372	-0.280
TL6	-0.562	-0.337	-0.282	**0.934**	-0.333	-0.363	-0.276
PTI1	0.498	0.645	0.556	-0.368	**0.960**	0.718	0.727
PTI2	0.473	0.617	0.569	-0.360	**0.961**	0.713	0.744
PTI3	0.443	0.563	0.527	-0.361	**0.933**	0.782	0.661
PSI1	0.457	0.574	0.552	-0.382	0.741	**0.953**	0.645
PSI2	0.459	0.600	0.541	-0.401	0.736	**0.941**	0.622
PSI3	0.448	0.563	0.498	-0.398	0.724	**0.946**	0.635
AI1	0.463	0.539	0.485	-0.313	0.702	0.620	**0.945**
AI2	0.460	0.518	0.500	-0.308	0.706	0.645	**0.938**
AI3	0.434	0.506	0.510	-0.292	0.675	0.600	**0.936**
AI4	0.425	0.526	0.524	-0.300	0.722	0.649	**0.937**

The bold variables in the table denote the square root value of the AVE that is more than the corresponding values, indicating strong correlation between the constructs and their respective indicators (Table 3). The exogenous constructs showed a correlation value <0.85, and thus the better discriminatory validity is satisfied[21,22].

Table 3: Results of discriminant validity by Fornell-Larcker criterion.

	Factors	*1*	*2*	*3*	*4*	*5*
		HC	OI	RC	SC	TL
1	HC	**0.913**				
2	OI	0.533	**0.856**			
3	RC	0.469	0.662	**0.920**		
4	SC	0.395	0.616	0.593	**0.887**	
5	TL	-0.622	-0.408	-0.410	-0.343	**0.868**

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.

Being unable to determine the lack of discriminant validity in general research works, the Fornell-Larcker criteria is surely a debabatable topic [23]. HTMT ratio in terms of multi-trait-multi-method matrix has been thus proposed in this study. When the HTMT values are higher than 0.90 or 0.85, the discriminant validity exhibits few issues. However, the HTMT values are recorded to be less than 0.85 (Table 4), thus satisfying the validity value.

Table 4: Results of discriminant validity by HTMT.

	Factors	1	2	3	4	5
		HC	OI	RC	SC	TL
1	HC					
2	OI	0.571				
3	RC	0.517	0.707			
4	SC	0.426	0.645	0.640		
5	TL	0.678	0.427	0.443	0.364	

C. Structural Model Assessment

Beta (β), R^2, and the corresponding t-values were implemented through the boots trapping mechanism of 5000 resamples to evaluate the structural model. The analysis was made on the basis of the effect sizes (f^2) and the predictive relevance (Q^2) with p-value determining the presence of any effect. However, the effect size is not mentioned [24].

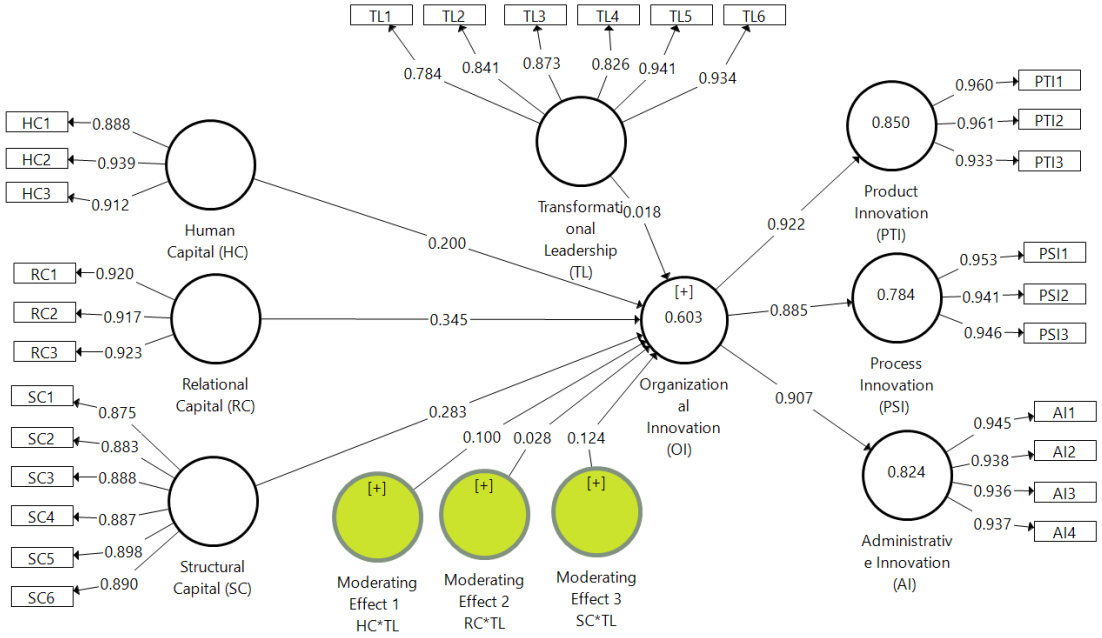


Fig. 3. PLS algorithm results.

Direct Hypotheses Tests

The structural model in the current research supports all the three proposed hypotheses (Fig 3 and Table 5). Hence, H1, H2, and H3 are accepted with ($\beta = 0.200$, t= 4.573, p<0.001),($\beta = 0.345$, t= 7.778, p<0.001), and ($\beta = 0.283$, t= 7.091, p <0.001) respectively.

The association between the exogenous and endogenous constructs is computed by using basic path co-efficient depicting the direct influence of system quality on user satisfaction. Nearly 69% of user satisfaction variance is described in terms of system, information, and service qualities. The values of R^2 have an acceptable level of explanatory power, indicating a substantial model [25].

Effect sizes (f^2) was examined in this research. Researchers analyzed and it determined the effect of the exogenous latent construct and assess the change in the R2 values. Hence the f2 values are recorded in the Table 4, which depicts one medium and two small effect size relationships [25].

The blindfolding procedure has should been employed on the endogenous constructs of this study with a reflective measurement only, when predictive relevance (Q2) value is more than 0 (Hair et al., 2017), thereby concluding in an adequate amount of predictive relevance (Table 5).

O'brien [26] had suggested that the multicollinearity problems that overlaps the variance explained by the exogenous constructs in endogenous variables. Variance inflation factor (VIF) is referred as the measurement of the multicollinearity degree [26]. Values more than 10 for VIF denotes an issue, whereas the value more than just 5 denotes multi-collinearity issues [27,28]. There is no significant multicollinearity issue among the exogenous constructs. In other words, there is no overlapping of the variance explained by the exogenous constructs in endogenous variables.

Table 5: Structural path analysis result.

Hypothesis	Relationship	Std Beta	Std Error	t-value	p-value	Decision	R^2	f^2	Q^2	VIF
H1	HC→OI	0.200	0.044	4.573	0.000	Supported	0.60	0.054	0.403	1.854
H2	RC→ OI	0.345	0.044	7.778	0.000	Supported		0.168		1.790
H3	SC→ OI	0.283	0.040	7.091	0.000	Supported		0.123		1.632

Moderation Hypotheses Tests

A moderating variable is one that 'moderates the effects' of a predictor variable on its outcome variable [21]. It also plays crucial roles in varied theories of social science. This study focuses on how the relation between HC, RC, and SC as well as the organizational performance affects the functionality of the TL. Capitals are considered as predictors, performance as the study outcome, and TL as the moderator.

The conceptual model of moderation in Figure 4.a shows how the moderating variable influences the relation between the other two variables. If transformational leadership were moderators, then the strength or direction of the relationship between predictor and outcome is affected by transformational leadership.

The statistical moderation model in Figure 4.b., shows how it conceptualizes moderation statistically: The interaction between the variable result in confirming the occurrence of the moderation, however, the relation between the moderator and predictor is essential to make this interaction a valid one.. Researchers in many situations have a continuous (rather than a categorical) moderator variable that they believe can either strengthen or dampen a specific relationship between two latent variables and that moderators may also change the direction of relationships [20]. Awang [21] states that before introducing a moderator into a model, the effect of a predictor on its outcome must exist and be significant. Thus, when a moderator enters the model, the causal effects will change due to some "interaction effect" between the predictor and moderator variable just entered.

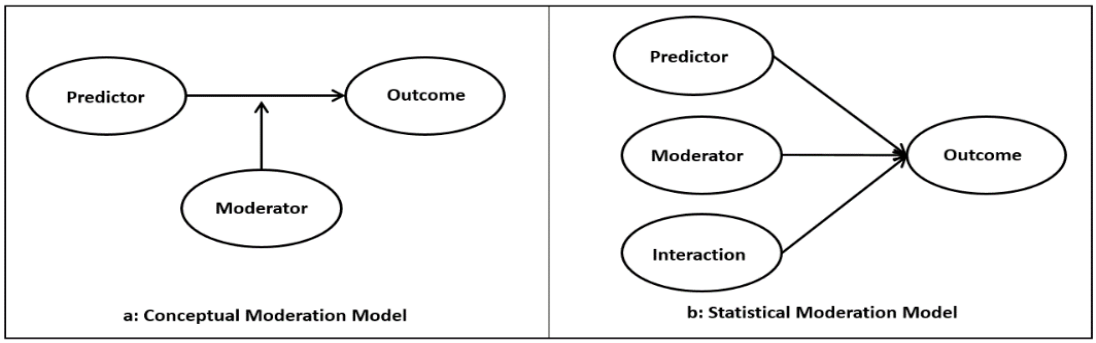


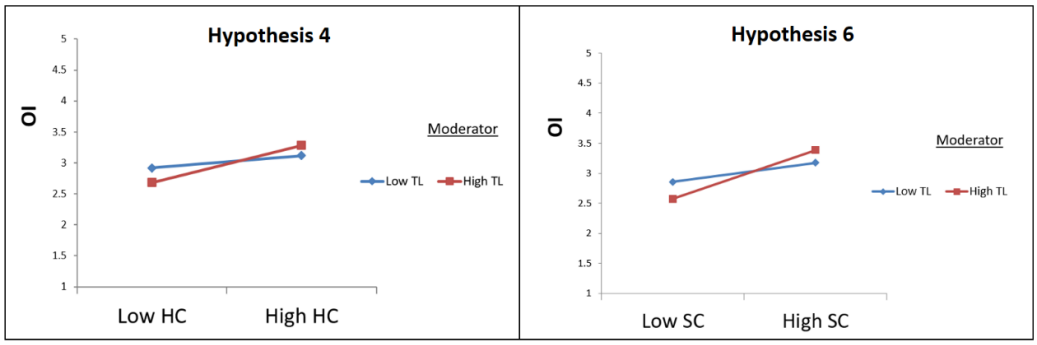
Fig. 4. Conceptual and statistical moderation model.

As shown in Figure 3 and Table 6, three sub-hypotheses were tested for the three main hypothesis namely: (1) Testing the causal effect of the predictor on the outcome. (2) Testing the causal effect of moderating on the outcome. (3)Testing the causal effect of interaction (predictor*Moderating) on the outcome. The moderation assessment of this study was tested through hypotheses H4, H5 and H6. A bootstrapping procedure with a resample of 5,000 was also performed to assess the interaction effect. The results in Figure 4 and Table 6 show that transformational leadership moderates (strengthens) the impact of human capital on the organizational innovation ($\beta = 0.100$, t= 2.093, p<0.05), so, H4 is accepted. In addition, transformational leadership also moderates (strengthens) the impact of structural capital on organizational innovation, ($\beta = 0.124$, t= 2.560, p<0.05), so, H6 is accepted. However, H5 is rejected.

Table 6: Result of Moderating effects Hypotheses.

		Std Beta	Std Error	t-value	p-value	Decision
H4	H4.a: HC→OI H4.b: TL→OI H4.c: TL*HC→OI	0.200 -0.018 0.100	0.044 0.045 0.048	4.573 0.400 2.093	0.000 0.690 0.037	Supported
H5	H5.a: RC→OI H5.b: TL→OI H5.c: TL*RC→OI	0.345 -0.018 0.028	0.044 0.045 0.056	7.778 0.400 0.508	0.000 0.690 0.611	Not supported
H6	H6.a: SC→OI H6.b: TL→OI H6.c: TL*SC→OI	0.283 -0.018 0.124	0.040 0.045 0.048	7.091 0.400 2.560	0.000 0.690 0.011	Supported

Note: HC: human capital, RC: relational capital, SC: structural capital, OI: organizational innovation, TL: transformational leadership.



Note: HC: human capital, SC: structural capital, OI: organizational innovation, TL: transformational leadership.

Fig. 4 . Moderating effects of result transformational leadership.

V. DISCUSSION

The main objective is to examine the moderating effect of transformasinal leadership between the intellectual capital and the organizational innovation the effect of intellectual capital on the organizational innovation in the public sector in the UAE, specifically, Abu Dhabi police department.

Human capital as highlighted in, indicated of its significant influence on organizational outcomes including organizational innovation. Past studies have revealed that the compensation is connected directly to the human abilities. This theory has been tested in many forms of empirical studies which significantly indicated positive relationship between human capital and abilities to the innovation and competitive advantage. Thus, this finding is consistent with the past studies and literature that investigated the effect of human capital on the innovation of organizations in organizations. The result of the analysis showed significant effect of human capital on organizational innovation with ($\beta = 0.241$, t= 6.046, p <0.001). This result explain the importance of the human capital to the intangible performance of the organizations (innovation) in organizations in the UAE.

Second hypothesis was examined to prove the relationship between relational capital and organizational innovation. Result from testing H2 was supported with ($\beta = 0.371$, t= 8.525, p <0.001), this supports the assumption that there is a significant of the relationship between relational capital and innovation. This study confirms the importance of relational capital among employees in the UAE to the innovation (performance) of their organizations. This result matched with, his research believed that the worker productivity is influenced by their networking in the organization. Thus, the communication and teamwork between the employees in Abu Dhabi police department the UAE is an important matter as their skills and knowledge, each one of the employees is contributing to the innovation of their organizations by their knowledge and by communicating in their work field.

The third objective of this study is to determine the influence of structural capital on organizational innovation among employees within the Abu Dhabi police department in the United Arab Emirates. Structural capital has a positive effect on organizational innovations and the relation is significantly positive with ($\beta = 0.301$, t= 7.601, p <0.001). Therefore, hypothesis H3 is supported empirically. This means that it is imperative for Abu Dhabi police department to develop structural capital to reinforce organizational innovation not only product innovation, but also. Firms ought to address structural capital appropriately.

In the current study, the results revealed that transformational leadership has a moderating (strengthen) effect between human capital and organizational innovation among employees within Abu Dhabi police department, which confirms the moderation role that transformational leadership has in this context. Simply stated, the more the top management help them develop their potential and strengths, spend time teaching and coaching, talk optimistically about the future of the organization, suggest some new ways for to the employees to solve the problems, enable them to think about old problems in new ways, and provide recognition/rewards when they reach their goals; the more the employees are creative, always suggest and adopt new ideas, efficient in utilizing resources and meeting all task deadlines, and the more knowledgeable employees become. Consequently, the organizational innovation will be strengthen and the more organization new technology is adapted for improving the work processes, try new methods for improving processes, and quick to respond to changing needs of its customer, given that the leadership of the organization is committed to establish directions that will be aligned with all activities, teams and units that will ultimately be at the best interests of Abu Dhabi police department and therefore public sector in the UAE.

On the other hand, transformational leadership does not have any moderation effect between relational capital and organizational innovation among employees within the Abu Dhabi police department, which reflects the insignificance of this suggested hypotheses. Thus, hypothesis five is not supported. The reason behind this might be the collectivism society that the UAE represents. It takes more than a person to make a change in the social characteristics and relations within organizations in the United Arab Emirates. The organization its self as values and vision needs to have the innovation aspect, and since we are talking about public sector in the UAE the government needs to promote the innovation concept and factors that affect it such as the intangible assets (i.e. intellectual capital), and the transformational leadership.

The results revealed that transformational leadership has a moderating effect (strengthen) between relational capital and organizational innovation among employees within Abu Dhabi police department, which confirms the moderation role that transformational leadership has in this context. Simply stated, the more the top management make sure that overall operations procedure of their organization is efficient, responds to changes very quickly, easily accessible information system, support innovation, and organization's culture and atmosphere are flexible, comfortable, and supportive. Consequently, the organizational innovation will be strengthen and the more organization new technology is adapted for improving the work processes, try new methods for improving processes, and quick to respond to changing needs of its customer, given that the leadership of the organization is committed to establish directions that will be aligned with all activities, teams and units that will ultimately be at the best interests of Abu Dhabi police department and therefore public sector in the UAE.

VI. IMPLICATIONS

A. Implications for research

This is one of the first to investigate the direct relations hips between the actors of intellectual capital (Human capital, Relational Capital, and Structural capital) and the different types of innovations (product, process and administrational innovation). Furthermore, it has investigated the moderation effect of transformational leadership between the intellectual capital players and the organizational innovation. Hence, it contributes to the body of existing literature.

Based on the empirical data, the main contribution of the current study is the comprehensive intellectual capital- organizational innovation analysis based on empirical data. The present study emphasizes more on IC and organizational innovation. First, the relationship between the three elements of IC and innovations was evaluated, i.e. both the direct and direct influence of IC on the production related innovation in the public sectors represented by Abu Dhabi police department in the UAE.

The intellectual capital concept is a new idea for majority sections of the UAE based organizations or the Arab countries. Hence, the current study focuses on the importance of enhancing the knowledge of the internal members of an organization in comparison with other individuals, groups, and customers in terms of organizational innovations. The concept of intellectual capital is a newly emerging concept, and until now, it is not fully understood by most organizations in the UAE or the Arab world. This study represents a major foundation in elevating this concept within the Emirates public sector. Therefore, this study has provided a comprehensive illustration of how the role of internal knowledge relates to individuals, groups, formal organization and external knowledge such as the relationship with customers in supporting innovations [29-31].

B. Implication for practice

This study has provided many benefits for Abu Dhabi police department managers and public sector in general to view intellectual capital as an element that acts as a stimulator for varied new and different forms of innovations. Abu Dhabi police department should work in direction of enhancing the relation between the employees and clients for better outcomes. Moreover, they should encourage their team members to think and work on generating new ideas and increase their performance level. The higher authorities should utilize this concept to bring alterations in both their technological and administrative processes [31].

VII. LIMITATIONS AND SUGGESTIONS FOR FUTURE WORK

This study has only tested the research model in the Abu Dhabi police department. In addition, this study focused in the public sector and did not cover the private sector.

Furthermore, this study examined the three elements of intellectual capital which appear as the important resources to the innovation of organizations in the United Arab Emirates and also the moderating role of transformational leadership. Thus, this study recommends expanding the research to be carried out in the other states in the UAE that was not covered in this study. Since each and every state may have different characteristics of culture that may affect the study.

VIII. CONCLUSION

The main objective of this study is to test the indirect impact of Intellectual capital (Human capital, Relational Capital, and Structural Capital) on the organizational innovation through the moderation of transformational leadership in addition to the direct effect of intellectual capital on organizational innovation within Abu Dhabi police department in the UAE. Five hypotheses were achieved by testing the mempirically and one hypothesis was not supported (H5). Transformational leadership was found to strengthen the relationship between human capital, structural capital and the organizational innovation. Moreover, the communication and teamwork between the employees in the UAE is an important matter as their skills and knowledge, each one of the employees is contributing to the innovation of their organizations by their knowledge and by communicating in their work field. Structural capital comesseond in explaining the innovation of the organization. Moreover, Human capital plays a role helping the organizations to improve their innovation and compete to stay alive. The study findings will help the organizational managements to apprehend the relation between varied factors that lead to innovations. It also focuses on the role of the TL in this innovation.

Appendix

Appendix A

Instrument for variables.

Varible	Measure
Human Capital (HC)	HC1: We have knowledgeable employees HC2: We have creative employees HC3: We have highly skilled employees
Relational Capital (RC)	RC1: We have a close relationship with our customers RC2: We have a close relationship with our suppliers RC3: We have a close relationship with our partners
Structural Capital (SC)	SC1: The overall operations procedure of our organization is efficient. SC2: Our organization responds to changes very quickly. SC3: Our organization has an easily accessible information system. SC4: Systems and procedures of our organization support innovation. SC5: Our organization's culture and atmosphere are flexible and comfortable. SC6: There is a supportive environment among different departments in our organization.
Product Innovation (PTI)	PTI1: We always develop new product and services. PTI2: We try to introduce and diversify our product to suit customer needs PTI3: We always try applying new idea/technology at our organization.
Process Innovation (PSI)	PSI1: In my organization, new technology is adapted for improving the work processes (computers, wireless networking etc.). PSI2: In our organization, we try new methods for improving processes (paperless environment, online learning etc.). PSI3: Our organization is quick to respond to changing needs of its customer.
Administrative Innovation (AI)	AI1: Administrative support is always there for employees. AI2: Employees compensation system is linked to performance. AI3: Our institution has a new and improved performance evaluation system. AI4: At our organization, we believe in the open communication environment. AI5: In our organization, employees are hired on their creativity.
Transformational Leadership (TL)	TL1: Our leaders help us develop our potential and strengths. TL2: Our leaders spend time teaching and coaching. TL3: Our leaders talk optimistically about the future of the organization. TL4: Our leaders suggest some new ways for us to solve the problems. TL5: Our leaders enable us to think about old problems in new ways. TL6: Our leaders provide recognition/rewards (e.g. appraisal, good marks, praise) when we reach our goals. TL7: Our leaders express with a few simple words what we could and should do.

REFERENCES

[1]. Ameen, A., & Ahmad, K. (2013a). A Conceptual Framework of Financial Information Systems to reduce corruption. *Journal of Theoretical and Applied Information Technology,* Vol. **54,** No.1, PP. 59–72

[2]. Ameen, A., Almari, H., & Isaac, O. (2019). Determining Underlying Factors that Influence Online Social Network Usage Among Public Sector Employees in the UAE. In Fathey M. Faisal Saeed, Nadhmi Gazem (Ed.), Recent Trends in Data Science and Soft Computing. IRICT 2018. Advances in Intelligent Systems and Computing (Recent Tre, Vol. 843, pp. 945–954). Springer Nature Switzerland AG: Springer International Publishing. http://doi.org/10.1007/978-3-319-99007-1

[3]. West, M. A., & Farr, J. L. (1990). Innovation and Creativity at Work: Psychological and Organizational Strategies. Wiley.

[4]. Ameen, A. & Ahmad, K. (2011). The Role of Finance Information Systems in anti financial corruptions: A theoretical review. *In 11 International Conference on Research and Innovation in Information Systems* (ICRIIS'11 PP. 267–272).

[5]. Ameen, A. & Ahmad, K. (2012). Towards Harnessing Financial Information Systems in Reducing Corruption : A Review of Strategies. *Australian Journal of Basic and Applied Sciences*, Vol. **6,** No. 8, PP. 500–509.

[6]. Yang, J. (2004). Job-related knowledge sharing: comparative case studies. *Journal of Knowledge Management*, **8**(3): 118–126.

[7]. Alkhateri, A.S., Abuelhassan, A.E., Khalifa, G.S.A., Nusari, M., & Ameen, A. (2018). The Impact of perceived supervisor support on employees turnover intention : *The Mediating role of job satisfaction and affective organizational commitment. International Business Management,* Vol. **12**, No.7, PP. 477–492. http://doi.org/10.3923/ibm.2018.477.492

[8]. Yang, C.C., & Lin, C. Y.Y. (2009). Does intellectual capital mediate the relationship between HRM and organizational performance? Perspective of a healthcare industry in Taiwan. *The International Journal of Human Resource Management*, Vol. **20**, No. 9, PP. 1965–1984.

[9].. Yamaguchi, I. (2013). A Japan–US cross-cultural study of relationships among team autonomy, organizational social capital, job satisfaction, and organizational commitment. *International Journal of Intercultural Relations*, Vol. **37**, No.1, PP. 58–71. http://doi.org/https://doi.org/10.1016/j.ijintrel.2012.04.016

[10].. Wu, W., Chang, M., & Chen, C. (2008). Promoting innovation through the accumulation of

intellectual capital, social capital, and entrepreneurial orientation. *R&D Management*, Vol. **38**, No.3, PP. 265–277. http://doi.org/10.1111/1467-9914.00120-i1

[11]. Ringle, C.M., Wende, S., & Becker, J.M. (2015). SmartPLS 3. Bonningstedt: SmartPLS.

[12]. Schumacker, R. E., & Lomax, R. G. (2004). A Beginner's Guide to Structural Equation Modeling. New York: Lawrence Erlbaum.

[13]. Hair, J.F., Black, W.C., Babin, B.J., & Anderson, R.E. (2010). Multivariate Data Analysis. New Jersey.

[14]. Barclay, D.W., Higgins, C., & Thompson, R. (1995). The partial least square (PLS) approach to causal modeling: Personal computer adoption and use as an illustration. *Technology Studies*, Vol. **2**, No.2, PP. 285–309.

[15]. Isaac, O., Abdullah, Z., Ramayah, T., &Mutahar Ahmed, M. (2017). Examining the Relationship Between Overall Quality, User Satisfaction and Internet Usage: An Integrated Individual, Technological, Organizational and Social Perspective. *Asian Journal of Information Technology*, Vol. **16**, No.(1), PP. 100–124. http://doi.org/10.3923/ajit.2017.100.124

[16]. Kannana, V.R., & Tan, K.C. (2005). Just in time, total quality management, and supply chain management: understanding their linkages and impact on business performance. Omega: *The International Journal of Management Science,* Vol. **33**, No.2, PP. 153–162.

[17]. Werts, C.E., Linn, R.L., & Jöreskog, K.G. (1974). Intraclass reliability estimates: Testing structural assumptions. *Educational and Psychological Measurement,* Vol. **34**, No.1, PP. 25–33.

[18]. Kline, R. B. (2010). Principles and practice of structural equation modeling (3rd ed.). New York: The Guilford Press.

[19]. Gefen, D., Straub, D., & Boudreau, M.-C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems,* Vol. **4,** No.1, PP. 1–79.

[20]. Hair, J.F.J., Hult, G.T.M., Ringle, C., & Sarstedt, M. A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), 46 Long Range Planning 328 (2014). London: Thousand Oaks: SAGE.

[21]. Awang, Z. (2014). Structural Equation Modeling Using AMOS. Shah Alam. Malaysia: University Teknologi MARA Publication Center. Chin, 1998.

[22]. Henseler, J., Ringle, C.M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, Vol. **34**, No.1, PP. 115–135.

[23]. Sullivan, G.M., & Feinn, R. (2012). Using Effect Size - or why the p Value is not enough. *Journal of Graduate Medical Education,* **4**(3), 279–282.

[24]. Cohen, J. (1988). Statistical Power Analysis for the Behavioral Sciences (2nd Editio). Lawre Associatesnce Erlbaum.

[25]. O'brien, R.M. (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality & Quantity,* Vol. **41**, No. 5, PP. 673–690. http://doi.org/10.1007/s11135-006-9018-6

[26]. Bowerman, B.L. (1990). Linear Statistical Models: An Applied Approach (2nd ed.). New York, London: PWS-Kent Pub. Co.

[27]. Myers, R.H. (1990). Classical and modern regression with applications (2nd ed.). Boston: MA: Duxbury.

[28]. Aldholay, A.H., Abdullah, Z., Ramayah, T., Isaac, O., & Mutahar, A.M. (2018). Online learning usage and performance among students within public universities in Yemen. *Int. J. Services and Standards*, Vol. **12**, No. 2, PP. 163–179.

[29]. Aldholay, A.H., Isaac, O., Abdullah, Z., & Ramayah, T. (2018). The Role of Transformational Leadership as a Mediating Variable in DeLone and McLean Information System Success Model: The Context of Online Learning usage in Yemen. Telematics and Informatics. http://doi.org/10.1016/j.tele.2018.03.012

[30]. Aldholay, A.H., Isaac, O., Abdullah, Z., Alrajawy, I., & Nusari, M. (2018). The role of compatibility as a moderating variable in the information system success model: the context of online learning usage. *International Journal of Management and Human Science (IJMHS),* Vol. **2**, No. 1, PP. 9–15