

The Impact of Human Capital and Structural Capital on Project Performance in the United Arab Emirates

El impacto del capital humano y el capital estructural en el desempeño del proyecto en los Emiratos Árabes Unidos

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ABSTRACT

The aim of this paper is to investigate the impact of human capital and structural capital on the project performance in the United Arab Emirates. The cross-sectional method is used to examine the constructed hypotheses. A total of 251 managers are participated in this study, these managers are selected from 721 infrastructure project providers. This study revealed that there is positive and significant relationship between human capital and project performance, as well as a positive and significant relationship between structural capital and project performance.

Keywords: Human Capital, Structural Capital, and Project Performance

RESUMEN

El objetivo de este artículo es investigar el impacto del capital humano y el capital estructural en el desempeño del proyecto en los Emiratos Árabes Unidos. Se utiliza método transversal para examinar las hipótesis construidas. En este estudio participaron un total de 251 administradores, estos administradores se seleccionan de 721 proveedores de proyectos de infraestructura. Este estudio reveló que existe una relación positiva y significativa entre el capital humano y el desempeño del proyecto, así como una relación positiva y significativa entre el capital estructural y el desempeño del proyecto.

Palabras clave: capital humano, capital estructural y desempeño del proyecto

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INTRODUCTION

Recently, the physical, tangible and economic assets of projects do not guarantee sustainability in the competitive capacities of organizations. As a result of this, the players have begun to reconsider the intangible assets that, according to IASB (2004), *non-monetary asset without physical substance held for use in the production or supply of goods or services, for rental to others, or for administrative purposes*. The need to measure intangible assets lies in the fact that decisions must be made on the basis of information that is capable of revealing the functioning of reality. This need is clear in terms of the measurement of Intellectual Capital (IC) in organizations, where indicators are needed, that are capable of expressing the value of the intangible assets contained in that real or potentially wealth-generating knowledge. The measurement of IC is necessary for projects to the extent that decision making, both internal and external, must be made on solid foundations (Rossi, Cricelli, Grimaldi, & Greco, 2016; Wang, Wang, & Liang, 2014). According to Khalique, Bontis, Abdul Nassir bin Shaari, & Hassan Md. Isa (2015) IC is an economic term that emerged in 1969 and was presented by the economist John Kenneth Galbraith, who suggested that it means action intellectual rather than pure knowledge. IC took off in the 90s, when the companies Skandia, Dow Chemicals and Canadian Imperial Bank, use the concept of IC to refer to all intangible assets, which include those skills based on the knowledge generated in organizations, they are also considered as the resources available to organizations that cannot be valued from traditional accounting (Heredero, Botella, & Los Santos, 2015). Over the years, the interest in investigating IC has increased, increasing its relevance, understanding, progress and impact. Hence, this consequence led to both the academic and practical fields.

In this regard, intangible assets and knowledge gains high attention from the project operators.

The rapid change of the project environment has created a growing need for adopting new business models, which involved several changes toward adapting the new environment opportunities and challenges. As the intangible assets of the project leads by the knowledge, and it represent the project commitment toward the fierce competition within the market, also it drives the competitive advantages and how the project capital can grow consistently.

Along to the much attention on the intangible assets of the project, many approaches have been proposed to clarify these assets definition, dimensions, and impact on the financial performance of the project. Most of these approaches and models have dealt with it as IC (IC). Edvinsson & Malone (1997) have highlighted that ensuring a long term sustainability for the organization focuses on the roots, not on the fruits of tree. This statement is retrieved based on Skandia navigator of IC, a decade before the work of Edvinsson & Malone. Skandia logic idea was that the organization needs to balance between developing the organization operations, and boosting the growth. Organization growth for Skandia was represented as a knowledge function development, it concentrates more on improving the interrelating between individuals and organization. Several studies have inspired by Skandia IC navigator, which paved the essential framework of IC. Edvinsson & Malone (1997) have classified the IC into two components, which are the Human Capital (HC) and the Structural Capital (SC).

LITRATURE REVIEW

The project management field is witnessing a change in the way of understanding what is expected from the labor market. Apparently the tendency is to enter a new reality in which human potential is the cause of economic growth. Training people, developing them and keeping them update with the latest technologies is the challenge facing today's employers and the immediate future. The industrial era moves away to make way for the era of people and talent, so it's called Human Age. Competitive advantages stop nesting in capital to focus on talent, on people, on the skills they possess. In the future, thanks to technology, borders will disappear; geographic barriers to finding a job will be able to perform any task from any place provided that the key to knowledge, capacity and ability is possessed. Human capital is a source of competitive advantage and is the key factor in the competitiveness of projects, regions and even countries.

The infrastructure projects providers were integrated into the national economy in the United Arab Emirate (UAE), providing sources of work, offering technology and creating infrastructure for the region. Take advantage of their business resources, their appropriate and timely application allows positioning in the daily business world. That is, if companies capitalize on the opportunities offered by the environment, they position themselves in the international market, improve their growth prospects and face the globally competitive economic scenario. Past global economic crisis (recession, 2008-2012) that have not ended send signals and a financial instability is perceived.

In the last two decades, numerous studies have been developed focused on the research for methodologies and models that contribute to improving the management capacity of IC. Despite this, it has not been possible to reach a consensus in which one of these models can be chosen as the guiding model, this is due to the intangible nature of these assets, and that each business has its own combination of knowledge keys, depending on the objectives and position of the firm in the market. The philosophy of the measurement of IC is focused on the determination of judgments that offer an estimate of the effectiveness of organizations. Therefore, the measurement of IC will be the

link between research and organizational practice, since it allows identifying the current state of performance and organizational development based on the achievement of relevant results that meet the needs of the elements of the environment (Khalique et al., 2015). Since the last decade of the twentieth century with the beginning of the studies related to the IC, the first models of measurement and management of intangible assets in organizations have emerged. For authors such as Mačerinskienė and Aleknavičiūtė (2015) the models are classified as basic and related. Basic models of IC are understood as those that arise over the years with the main objective of measuring the intangible assets of an organization and in order to make a diagnosis and render information about its IC allowing management decisions to be made. On the other hand, the related models are not strictly models of measurement and management of IC, but rather instruments of strategic direction of the company that contemplate in some measure, the intangible dimension of the organizations or the aspects that characterize the creation of value based on knowledge in action. Bueno, Arrién, and Rodríguez (2003) consider that the models can be classified as general and personalized. The models defined as general are those that have been created to be used by any organization and social sector, while the customized ones are generated for a specific type of organization.

Some similar characteristics among IC dimensions; in one way or another they include within their capitals or factors the Human, Relational and Structural and all use indicators to measure and manage intangible assets. Likewise, there are aspects that differentiate one from the others; there is no common language to name all the components of IC, some models highlight the interrelationships between these components while others do not and none of the models covers all the variables or indicators that have been defined in the literature to measure and manage the IC in organizations. The models of measurement of IC have defined in their elaboration a set of indicators to refer to the intangible assets that are elaborated by the organizations.

The review of literature clarifies the usefulness of IC. Intellectual Capital itself quest the research to better understand the roots of company's value, the measurement of the factors that motivate visible company (Edvinsson & Malone, 1997). Miller et al (1999) scrutinized manager's perceptions of the usefulness of IC. Regardless the type of the industry, manager emphasizes greatly on IC. Leana & Van Buren (1999) concluded in their study that IC is associated with firm's financial performance. However, Dumay & Garanina (2013) have observed the importance of non-financial assets and their effects on company's performance. Bontis et al (2000) investigated three components of IC named as, human capital, relational capital and structural capital. He also interlined those three components. His emphasis is mainly related to human and relational capital, which are significant for running the businesses where as structural capital has positive influence on business performance. Allen, Lee, & Reiche (2015) examined the interconnection of IC and performances measure of multinational companies in the context of IC. His results support the connection of IC to the financial performance. But certain condition must be met to maximize organization performance. So, it must be inimitable, non-substitutable, rare and precious (Zambon, 2016).

METHODOLOGY

According to the Emirate Ministry of Economy 721 unlisted companies works in infrastructure operations. Based on sample size table of Krejcie and Morgan (1970) the target sample size of this study is 251. The questionnaire instrument will be used, the measurements of the study variables will be adopted from the study of Bontis (1998) and modified by the study of Mention and Bontis (2013). The instrument will be consisted of items, 20 items for HC, 16 for SC, and 10 for the performance. Factor analysis is applied to analyse the data.

FINDINGS

For the research several types of respondents' profile categories were asked to the research sample, which are gender, age, education level, income level, and experience. For the gender category, there had been two types of gender in the research, which are male and female. The majority of the respondents were males with 76.1% and n=191, while the female respondents were 23.9% with n=60. For the second category of age, the highest group of age were in the age of 26-30 years old with 32.3 and n=81. The age group accounted 21.9% with n=55, this group was for the age of 31-35 years old. For the third group that is from 17-25 years old, it accounted 15.5% with n=39. And for the group of age from 36-40 years old, it had 13.5% with n=34. Finally, the last group was for the age of above 40 years old and it accounted 16.7% with n=42. The category of education level, the respondents showed that most of them are holding bachelor qualification with 66.9% and n=168. The second category was the diploma category with 19.5% and n=49. The last category was PhD, which recorded 13.5% and n=34. The income level category was concentrated in three levels which are \$500-\$750, \$751-\$1,000, \$1,001 and above. The highest group was in the \$1,001 and above category with 44.2% and n=111. The second category was \$500-\$750 with 38.2% and n=96. The last group was \$751-\$1,000 with 17.5% and n=44. The last category of the respondent profile was the experience; this category had three types, which are from 1-3 years, 4-6 years, and 7-9 years. The majority of the respondents recorded that there were 56.2% and n=141 having experience of 4-6. The second category was 7-9 years with 29.9% and n=75. Lastly, the category of 1-3 years with 13.9% and n=35. The

following Table 1 shows the results obtained from the respondents profile test.

TABLE 1: Respondents profile

	Frequency	%		Frequency	%
			7 to 9	75	29.9
Gender			Education level		
Male	191	76.1	Diploma	49	19.5
Female	60	23.9	Bachelor	168	66.9
Age			PhD	34	13.5
17-25 yrs	39	15.5	Income level		
26-30 yrs	81	32.3	USD500 - USD750	96	38.2
31- 35 yrs	55	21.9	USD751- USD1,000	44	17.5
36- 40 yrs	34	13.5	USD1,001 and above	111	44.2
> 40 years	42	16.7	Experience		
			1 to 3	35	13.9
			4 to 6	141	56.2

The reliability test was conducted to the research variables to ensure that all the items in the questionnaire were consistent. The results have shown that there is great consistency among the research variables. The Cronbach's Alpha values for the variables human capital, structural capital, and project performance are 0.804, 0.724, and 0.827 respectively. The following Table 2 shows the results.

TABLE 2: Reliability test

Factors	Items	Cronbach's Alpha
Human capital	5	0.804
Structural capital	4	0.724
Project performance	5	0.827

The normality test has been used in this research has been used to determine that the sample were selected based on normally distributed population. The accepted Skewness values are in the range of -1.96 - +1.96. The findings of this test showed that all the variables were accepted with Skewness values of -.210, -.245, and -.239 for the variables human capital, structural capital, and project performance, respectively. The following Table 3 shows the results.

TABLE 3: Normality test

Factors	Skewness	Kurtosis
Human capital	-.210	-.111
Structural capital	-.245	-.045
Project performance	-.239	-.541

The KMO test was applied to the variables to measure the proportion of variance for the research variables. The accepted value for the KMO test above 0.5, and by applying this test to the current research, the value found was 0.783. Also the Bartlett's test shows a significant value of 0.000. The following Table 4 shows the results.

TABLE 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.783
Bartlett's Test of Sphericity	Approx. Chi-Square	1294.521
	df	91
	Sig.	.000

The aim of the factor analysis is to ensure that all the items of the variables are correlated. The determinant for this test should be greater than 0.00001. In summary, it can be said that the factor analysis aims to find independent latent variables. Based on the results obtained in table 5, it has been found that all the items correlate with each other. The correlation of the items is ranged between 0.653 and 0.849, which obviously shows a high correlation found for all the items.

TABLE 5: Factor loading

Items	Component		
	1	2	3
PP1	.849		
PP4	.797		
PP3	.771		
PP2	.671		
PP5	.667		
HC4		.840	
HC3		.823	
HC5		.789	
HC1		.653	
HC2			
SC2			.807
SC3			.772
SC4			.754
SC1			

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

- a. Rotation converged in 5 iterations.

The correlation test was applied to the research variables to find out the type of relationship between the independent variables and the dependent variable. The research has found there is positive and significant relationship between human capital and project performance, also there is positive and significant relationship between structural capital and project performance. The p-value less than 0.05 and the significance was shown on the value of ($r=0.372$) and ($r=0.169$) respectively.

TABLE 5: Correlations test

		HC	SC	PP
HC	Pearson Correlation	1		
	Sig. (2-tailed)			
SC	Pearson Correlation	.175*	1	
	Sig. (2-tailed)	.005		
PP	Pearson Correlation	.372*	.169**	1
	Sig. (2-tailed)	.000	.007	

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

Based on Table 5, the regression results claim that human capital and structural capital are significantly positive to the project performance. The regression model could explain 43% ($R^2 = 0.43$) variance in project performance. A significant regression equation was found ($F(2,763) = 43.00, P < .000$), with R^2 of (0.43). The study respondents expected the human capital and structural capital regression is equal to $[2.763 + 0.289 + 0.087]$ unit for the project performance.

TABLE 5: Regression test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2.763	.207		13.339	.000
HC	.289	.049	.353	5.938	.000
SC	.087	.048	.107	1.795	.074
Adjusted R ²			43%		

*Confident level 90%

DISCUSSION

The results found from the current research are relevant to the results of the Solow's neoclassical theory of Solow (1956), the increase of capital and labor mean an increase in productivity and economic growth; for Denison (Denison, 1957) the capital increase and the increase of work revert to progress and investment in intangibles; (Barro, 1991; Lucas Jr, 1988; Romer, 1994) with the theory of human capital, Becker, Murphy, and Tamura (Becker, Murphy, & Tamura, 1990) treat IC in their theories. They conclude that they have observed how the research trend of IC has been dominated by accounting and management perspectives with a little influence of psychology and sociology. That is why they see the need to highlight a theory of IC that emphasizes the human attributes of individuals and working groups. They have developed a double conception of human capital and at the same time they have identified a new component of structural capital labeled with fluid structural capital against what is crystallized structural capital.

Human capital is recognized as the primary element to study IC. It includes all the individual capacities, knowledge, skills, experience, training, aptitudes, motivation, training, incorporation of new technologies and their contribution to the company. In general, everything that the worker develops and contributes to the growth of the firm in a harmonious and coherent way. According to Kianto, Ritala, Spender, & Vanhala (Kianto, Ritala, Spender, & Vanhala, 2014), Human Capital is the knowledge that each person acquires and accumulates in the trajectory of academic and work training, mentions also that the individual qualities that they possess are part of, such as loyalty and flexibility, which may affect the value of the subject's contribution to the institution. Human Capital is made up of the knowledge, skills, competences, attitudes and abilities that people possess, develop and accumulate

throughout their lives. It has the power to endow organizations with intelligence, innovation, flexibility and social responsibility. It is not owned by the company and is the basis for generating other types of IC.

Structural Capital is understood as everything that remains in the organization when employees leave. It represents particularly to each organization because it responds to the causes that originates it and constitutes property of it. Authors such as Edvinsson (Edvinsson, Malone, & Bonneville, 1999) consider that the Structural Capital contains of the Client Capital and Organizational Capital. According to Edvinsson (Edvinsson et al., 1999), latter on it is divided into Capital Innovation and Capital Processes, where the Organizational and Technological capitals can be included according to Aramburu, Sáenz, and Blanco (Aramburu, Sáenz, & Blanco, 2013). It is understood as components of the Structural Capital of the Intellectual Property that comes from the legal protection that the company exercises over the assets that represent a special value for it, such as trademarks, patents, copyright, rights of design and manufacturing secrets. There is also the Organizational Capital that includes the value created by the internal structure of the organizations, as well as the way in which the operations and processes that take place within it are carried out.

The current study has found out that there is positive and significant relationship between human capital and project performance, as well as a positive and significant relationship between structural capital and project performance. These results are supported with the previous studies that were discussed above.

CONCLUSION

For the purpose of finding, the impact of human capital and structural capital on project performance. For that purpose, the researcher has come with a conceptual framework to examine these relationships. The literature review was included in the process of this research to provide a theoretical background to the research variables. The researcher has used to the quantitative research approach to collect the data from the 251 respondents. The questionnaire was used as the research instrument. Several tests were conducted to the collected data such as the respondents' profile, descriptive statistics, normality test, factor analysis, reliability test, correlation, and regression tests. The study has found out that there is positive and significant relationship between human capital and project performance, as well as a positive and significant relationship between structural capital and project performance.

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