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The Impact of the Intellectual Capital on Business Performance: Evidence from the Algerian Companies

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Abstract: The purpose of the study is to investigate the impact of Intellectual Capital (IC) In Algerian Companies' Business Performance (BP). The data was collected from 307 employees by means of a questionnaire. Statistical techniques such as descriptive statistics, t-test, ANOVA test, correlation and multiple regressions were employed. To confirm the suitability of data collection instrument, a Kolmogorov-Smirnov (K-S) test, Cronbach's Alpha and factor analysis were used.

The present study found that each of the three types of intellectual capital to be associated with increased business performance. Human capital, social capital and organizational capital exhibited weak relationship with business performance.

Human capital exhibited positive and weak relationship with performance. Social capital is regarded as the strongest predictor of performance and the relationship between organisational capital and performance become statistically significant in the study.

These results refer the necessary to increase the awareness of the manager, the important of the component of the intellectual capital in result to increase the business performance. The results are in line with J. Choudhury (2010).

Key Words: Intellectual Capital (IC), Human Capital (HC), Social Capital (SC), organizational Capital (OC), Algerian companies, Business Performance (BP).

I. Introduction

As Peter Drucker said "The most important, and indeed the truly unique, contribution of management in the 20th century was the fifty-fold increase in the productivity of the manual worker in manufacturing. The most important contribution management needs to make in the 21st century is similarly to increase the productivity of knowledge work and knowledge workers. The most valuable assets of a 20th-century company was its production equipment. The most valuable asset of a 21st-century institution (whether business or no business) will be its knowledge workers and their productivity" (Drucker, 1999)

The IC notion is based to the practice (Mouritsen, 1998). According to Bontis (1998), the beginning of IC research has primarily evolved from the desire of practitioners. The development in IC is appeared firstly in the form of popular press articles in business magazines and national newspapers. In recent years the IC topic has attracted increasing interest of researchers and academics (Bemhut, 2001; Fincham & Roslender, 2003)

II. Definitions of IC

As many authors point out, a major proportion of growth companies are valued beyond book value. The market value of a firm consists of its financial capital and "something else". The first term is the firm's book value and is formed by organizational financial and physical assets. The "something else" term represents the firm's intellectual capital, defined as resources created from internal learning and development of valuable relationships. (Ordonez de Pablos, P., 2002)

The term "intellectual capital" was first used by the economist John Kenneth Galbraith in 1969 (Andriessen, 2006; Bontis, 1998; Stewart, 2006; Steenkamp, 2007)

Stewart (1997) defines intellectual capital as the intellectual material – knowledge, informations, intellectual property, experience – that can be put to use to create wealth. Union Fenosa, a top Spanish firm, defines intellectual capital as "the set of intangible values that promote the organizational capability for generating profits now and in the future" (Union Fenosa, 1999).

Various other definitions use concepts such as, ability, skill, expertise, and other forms of knowledge that are useful in organizations. A comprehensive definition of IC is offered by Brooking (1996). "IC is the term given to the combined intangible capital which enables the company to function". Petty and Guthrie (2000) observed "IC is instrumental in the determination of enterprise value and national economic performance"

Edvinsson and Malone (1997), for example, view intellectual capital as being comprised of two primary components: human capital (i.e., the knowledge skills and experience of employees) and structural capital (i.e., the embodiment, empowerment, and supportive infrastructure of human capital). The authors then sub-divide structural capital into two smaller components: organizational capital (i.e., the systems, tools, and operating philosophy that speed the flow of knowledge through the organization) and customer capital (i.e., relationships a company has with its customers). (Youndt .M & Snell.S, 2004).

III. Components of IC

The different components proposed by several researchers are mentioned in the table below:

Table (1): Components of IC

Theorist	Year	Consists of
Becker Drucker	1975 1985	Human capital: knowledge, expertise, education .Intangible: resides in individuals, complementary to other forms of capital, difficult to measure .Defferentiates mental effort from physical labour and enables learning to be taken into account.
Bourdieu Coleman Burt	1986 1988 1992	Social capital :Intangible : resides in networks and relationships and is collectively owned .Difficult to measure but enables the added value of organizational skills to be taken into account
Kaplan and Norton	1992	Custommers , internal business , learning and growth
Brooking	1996	Market assets, human –centred assets , intellectual property and infrastructural assets
Sveiby	1997	Invisible assets of the organization including employee competence , skills , education and experience and their ability to act in a variety of situations. Internal structure :management , structure , patents , models ,R&D capability ,software External structure : image , brands , customers and supplier relations.
Bradley	1997	Innovation, Tradeable,cheap to reproduce , appreciates rather than depreciates with use.Multiple and potentially simultaneous application.
Roos et al	1997	Human capital , organizational capital and relational capital :thinking and non-thinking assets where the distinction is made because human capital requires management in a different way .Relational capital includes relationships between internal and external stakeholders.
Stewart	1997	Human capital ,structural capital and customer capital :intellectual material :knowledge , information, intellectual property and experience which can be utilized to create wealth.Customer capital includes relationships between customers and suppliers.
Hannes and Lowendahl	1997	Suggest a distinction between intangible resource of competence :the ability to perform at individual and organizational levels and relationship :company reputation and customer loyalty :Both of these exist individually and collectively.
Edvinsson and Malone	1997	Human capital :employees and managers and what they can do individually and collectivly . Systems :which represent the knowledge in the company as regards patents ,contracts ,databases, information and production technology . Market :relationships between the organization and external bodies,suppliers, distributors and customers
Bontis	1997	Human capital , structural capital ,relational capital ,intellectual property : unlike intellectual capital , intellectual property is a protected asset with a legal definition.
Ulrich	1998	Competence and commitment of employees :knowledge, skill or ability is applied to meeting the organization's goals and purposes.
Nahapiet and Ghoshal	1998	Individual and social tacit and explicit knowledge
Granstrand	1999	Immaterial resource :intellectual property, goodwill and power in internal / external relationships , relational and organizational capital ,human competence .Ownership is key :Capitalized value can be attributed only if is possible to exploit intellectual assets.
Sullivan	1999	Knowledge that can be converted into profits , Human capital :individual employees who possesses skills ,knowledge and know-how.Each employee possesses tacit knowledge that the organization should seek to utilize , and intellectual assets are created whenever human capital is codified.When this occurs the firm can move the intellectual asset rather than the individual to wherever it is needed .
Teece	2000	Intangible assets :knowledge , competence , brands,reputation,customer relationships ,intellectual property.
Mayo	2000	Human capital :capability, knowledge,skill,experience and networking with the ability to achieve results and the potential for growth. Individual motivation : aspirations,ambition,drivers,work motivation and productivity. Work group effectiveness :support ,mutual respect,sharing and values. Leadership :clarity of vision and ability to communicate that vision. Organizational climate : culture,freedom to innovate , openness,flexibility and respect for the individual.
Dzinkowski	2000	Intellectual assets and knowledge assets made up of human capital ,organizational (structural capital) and customer (relational) capital .Fixed or flexible ,and both the input and the output of the value reation process. The end –product of knowledge transformation.

Source: Wilson .J ,2005; *Human Resource Development:Learning and Training for individual and organizations*, Bell &Bain ,Glasgow, p45

IV. Literature reviews

In this part , we try to collect some research about our topic ., then take only a snapshot from each study , this section will focus on interrelationships among intellectual capital components and the impact of IC components on business performance :

Hosain, Freyedon & Homayouni (2011) concluded : there is meaningful relationship between intellectual capital and firm's performance. Also the human capital have important role in enhance of productivity in Iranian

corporate companies. If in the firms pay attention to absorption of expert personnel and develop of satisfaction of current staff in organization their performance will improvement. Chang & Hsieh (2011) : Empirical study is conducted on 367 Taiwan semiconductor companies using Pearson correlation and linear multiple regression whereas financial information is generated from a third party database from Taiwan Economic Journal. The result shows that a company's IC in general has a negative impact on its financial and market performance. Also the VAIC method allows managers to measure their IC and to benchmark against the competitors in the same industry and shows that the R&D expenditure(that added in the VAIC method) have the better explanation in the management of the knowledge –based economy . Yaghoubi , Kazemi & Moloudi(2010)The results illustrated that there is positive significant correlation between the mean scores of intellectual capital and organizational intelligence dimensions namely strategic vision, shared fate, appetite for change, heart, alignment and congruence, knowledge development, performance pressure and total scores of organizational intelligence ($p < 0.01$).

Santos-Rodrigues, Dorrego & Jardon (2008) : they use a survey from 68 firms working on the auto components sector, established in the Northern Spain and Northern Portugal. They found firstly, that innovativeness has two main dimensions, perfectly differentiated, the product-process innovation and the management innovation; secondly that the intellectual capital components influences differently each type of innovation capacity (innovativeness).

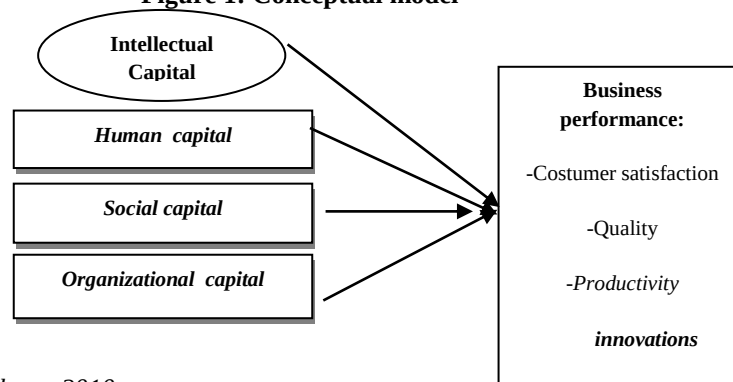
This study shows that the innovation is one of the element of the intellectual capital that has an effect on a firm's performance . Sharbati et.al (2013) investigate the impact of intellectual capital on business performance in Jordanian Telecommunication Companies(JTC) through 84 managers, by dividing intellectual capital into : human capital , structural capital and relational capital , the results showed a positive significant effect of IC on JTCs' business performance . The results also indicated that relational capital is positively and significantly affect JTCs' business performance , while structural capital and relational capital do not significantly affect JTCs' business performance The Empirical results also indicated that there are strong inter-relationships and interactions among the three components of Intellectual capital .

Huselid (1995) evaluated the links that exist between systems of high performance work practices and a company's performance. The study concluded that these practices have a significant impact on a company's performance. Youndt *et al* (1996) examined the relationship between human resource management, manufacturing strategy and a company's performance. The study concluded that human resource systems are directly related to a company's performance. Miller *et al* (1999) examined manager's perceptions of the usefulness and potential use of intellectual capital. The study concluded that managers place great emphasis on intellectual capital regardless of the type of industry. Van Buren (1999) examined the relationship between a core set of intellectual capital indicators and a company's performance. The study – the first to link intellectual capital to a company's performance – concluded that intellectual capital is associated with a company's performance.

V. Research Methodology

The model of this study is the model of Jyotirmayee Choudhury (2010) uses in Indian IT sector , that divided intellectual capital into three elements : human capital , social capital and organizational capital and their impact on performance. The variables of this model is shown as follows :

Figure 1: Conceptual model



Source: Jyotirmayee Choudhury, 2010

A. Study hypothesis

The study is intended to open few windows towards intellectual capital management and measurement. Since the accumulation of intellectual capital is outpacing the accumulation of physical assets as the key driver of competitiveness in the so called new economy the study is aimed at measuring the extent to which intellectual capital enhances business performance and adds value to the organisation and the hypotheses for the study is described as follows.

Hypothesis 1: An organisation's level of intellectual capital is positively related to business performance.
Hypothesis 2: Business performance is positively influenced by Intellectual capital

B. Data collection :

The respondents were all employees in Algerian companies . The questionnaire contained 64 statements to which respondents indicated the extent of their agreement on a 5-point Likert scale (1 = strongly disagree and 5 = strongly agree).

Our sample of this research was employees working in companies including : Banks, Industrial Goods and Services, Insurance , Telecommunications. Most of the respondents are situated in the medium level of the companies mentioned in the table follows. The response rate was 67.3 per cent.

Respondents were encouraged to ask questions about the purpose of the survey and to make sure that the meanings of the questions were clear. All such questions were answered during the administration of the survey. Very few concerns regarding the meanings of the questions were reported. About 60% of the respondents were from financial services (Banks) and the remaining 40% were from nonservice industries (e.g., production)

Data collected through quantitative survey approach . The questionnaires is distributed to 320 employees that work in different companies. In order to evaluate the intellectual capital, measurement for the three levels of IC had to be defined.

In this study, the responses and information collected from the various statistical methods will be used to analyze the data that we will collect from the 307 respondents. The Statistical Package for the Social Sciences (SPSS, version 17.0) package.

C. Respondents Profile :

The data for the study was collected from 307 respondents from various Algerian organisations. The data set covers various aspects of intellectual capital and business performance. As per the table-2 demographic profiles of the respondents consist of small, medium, and large organisation, where respondents from large organization constitute almost half of the total population in the study. Female participants in the study was one third where as male participants consisted of two third of the total population. Age wise distribution depicts 31-40 age group dominates in the study consisting of more than 40% of the total sample, The almost of the respondent have the license diploma ,it consists 28,7%. The respondents having less than 5years of experience at current organisation is very well present in the study consisting of 56, 35%

Table 2: Respondents Profile

Parameter	Group	#	%
Sex	Female	181	59
	Male	126	41
Age	20-30	48	15,6
	31-40	139	45,3
	41-50	91	29,6
	>50	29	12,1
Education	Primary	60	19,5
	Medium	68	22,1
	Secondary	83	27
	License	88	28,7
	Post Graduation	8	2,5
Profession	General manager	54	17,5
	Account	46	15
	Branch manager	121	39,4
	Others	86	28
Total Experience	>5years	173	56,35
	< 5 years	134	43,65
Total		307	100

Source: from SPSS

D. Descriptive analysis:

D.1 The test of the reliability:

In order to test for the reliability Cronbach's alpha was used to test the reliability of the measures. All variable and sub-variable items were confirmed valid since their factor loading values were more than 0.4. This result mirrors previous studies conducted by Bontis (1998); as shown in the table 3.

Table -3: The test of the Reliability and Normality

Items	Cronbach's alpha	(K-S)Z	Sig
Human capital	0.5602	0.768	0.456
Social capital	0.4686	0.02	0.654
Organizational capital	0.6167	0.567	0.354
Business performance	0.7846	0.923	0.234

Source : from SPSS

D.2 The Kolmogorov-Smirnov test:

The Kolmogorov-Smirnov test for normality was used to see whether the responses had a normal curve about the mean. All dependent and independent variables were tested for normality. If the significance level was more than 5 percent, normality was assumed.

Table (3) shows that all the independent and dependent variables are normally distributed.

Table- 4 : Statistical results of summary variables

Items	Mean	Std.Dev	t-value
Intellectual capital	3.30	1.224	51.003
Human capital	3.24	1.212	47.861
Social capital	3.36	1.205	58.166
Organizational capital	3.32	1.256	46.982
Business Performance	3.23	0.928	70.451
Consumer satisfaction	3.25	1.545	40.585
Quality	3.07	0.675	77.797
Productivity	3.22	0.673	86.916
Innovation	3.41	0.8215	76.507

Source : from SPSS

Table 4 depicts the mean scores of each variable and its corresponding construct. Generally speaking, all items scored in the affirmative (1 strongly disagree, 5 strongly agree, with 3 the mid-point) with mean values greater than 3.0.

E. Testing hypothesis :

The study is intended to open few windows towards intellectual capital management and measurement. Since the accumulation of intellectual capital is outpacing the accumulation of physical assets as the key driver of competitiveness in the so called new economy the study is aimed at measuring the extent to which intellectual capital enhances business performance and adds value to the organisation and the hypotheses for the study is described as follows.

Hypothesis 1: An organisation's level of intellectual capital is positively related to business performance.

The sub hypothesis are:

Hypothesis 1a: An organisation's level of human capital is positively related to business performance.

Hypothesis 1b: An organisation's level of social capital is positively related to business performance.

Hypothesis 1c: An organisation's level of organisational capital is positively related to business performance.

Since the population for the study is heterogeneous, a stratified random technique has been adopted to select the respondents for the study, 320 respondents were selected randomly from different levels of Algerian organisation. A linear regression model was drawn to explain the relationship between business performance and intellectual capital

Table 5: Intellectual capital Vs Business performance Summary

Performance	Intellectual Capital	Multiple R	R ²	Adjusted R ²	Std .Error
Business Performance	Human capital	0.370	0.136	0.022	3.252
	Social capital	0.449	0.201	0.055	3.529
	Organizational capital	0.435	0.189	0.007	3.968
	Intellectual capital			0.042	8.336
		0.485	0.235		

Source :from SPSS

As defined in table-5, the regression equation of the business performance with human capital, social capital and organizational capital.

The regression equation of business performance component with human capital, social capital and organizational capital clearly depict the model are well fit with R less than 0.5. Human capital is weak in explaining the relationship with R value 0.370.

The effect of human capital, social capital and organizational capital on business performance are significant with R value 0.370, 0.449 and 0.435 in this arrangement and intellectual capital as a whole has an influence on business performance with R value 0.485.(Table 6)

Table 6: Correlation matrix

	Human capital	Social capital	Organizational capital	Intellectual capital	Business performance
Human capital					
Social capital	0.345				
Organizational capital	0.456	0.768			
Intellectual capital	0.546	0.526	0.452		
Business performance	0.370	0.449	0.435	0.485	

Note: All correlation values are significant at the 0.01 level (two-tailed)

Hypothesis 2: Business performance is positively influenced by Intellectual capital

The sub hypothesis are :

Hypothesis 2a: Business performance is positively influenced by human capital .

Hypothesis 2b: Business performance is positively influenced by social capital .

Hypothesis 2c: Business performance is positively influenced by organizational capital

Business performance was regressed again three variables of intellectual capital namely (Human capital, Social capital and organizational capital)

The equation for business performance was expressed in the following equation:

$$Y_s = \beta_0 + B_1X_1 + B_2X_2 + B_3X_3, \text{ Where,}$$

Y_s = Business performance

β_0 = constant (coefficient of intercept)

X_1 = Human capital

X_2 = Social capital

X_3 = Organizational capital $B_1, \dots, B_3$ = regression coefficient of three variables

Table 7: Regression results of business performance based on the dimensions (N=307) dependent variable: Business performance independent variable :Three intellectual capitals

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	151.661	1	151.661	9.841	0.002
	Residual	4700.508	305	15.412		
	Total	4852.169	306			

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		Std. Error
1 (Con`stant)	1.005	1.805		6.098	0.000
HC	0.311	0.131	0.235	3.137	0.002
SC	0.461	0.272	0.449	5.361	0.000
OC	0.506	0.118	0.470	4.287	0.000

$p > 0.05$

Source: SPSS

The relationship between the dependent and independent variables derived by this model can thus be expressed as:

$$Y_s = 1.005 + 0.311X_1 + 0.461X_2 + 0.506X_3$$

Table (7) showed the results of the regression analysis and the impact of intellectual capital to the business performance. To predict the goodness-of fit of the regression model, the multiple correlation coefficient (R), coefficient of determination (R^2), and F ratio were examined. First, the R of independent variables (three factors, X_1 to X_3) on the dependent variable (Business Performance, or Y_s) is 0.461, which showed that the business performance had positive and high overall association with the three attributes. Second, the R^2 is 0.449, suggesting that more than 40% of the variation of business performance was explained by the three attributes. Last, the F ratio, which explained whether the results of the regression model could have occurred by chance, had a value of 9.841 ($p = 0.002$) and was considered significant. The regression model achieved a satisfactory level of goodness-of-fit in predicting the variance of business performance in relation to the three attributes, as measured by the below – mentioned R, R^2 , and F ratio. In other words, at least one of the three attributes was important in contributing to business performance. In the regression analysis, the beta coefficients could be used to explain the relative importance of the three attributes (independent variables) in contributing to the variance in business performance (dependent variable). As far as the relative importance of the three intellectual capital attributes is concerned, organizational capital, $B_3=0.506$, $p=0.000$) carried the heaviest weight for business performance, followed by social capital, $B_2=0.461$, $p=0.000$ and human capital, $B_1=0.311$, $p=0.000$.

The results showed that a one-unit increase in organizational capital would lead to a 0,506 unit increase in business performance, one-unit increase in social capital would lead to a 0.461 unit increase in business performance and one-unit increase in human capital would lead to a 0.311 unit increase in business performance.

In conclusion, the results of multiple regression analysis agree hypothesis 2, that there is the effect of intellectual capital to the overall business performance. So, there is a relationship and an impact of intellectual capital on the business performance.

In other words, the table also shows the results of the statistical analysis that mentions there is an influence of the intellectual capital dimensions on business performance, with F calculated equal 9,841 at the level of significance ($\alpha \leq 0.05$) that means the reject of the null hypothesis and accept the alternative hypothesis.

VI. Discussion

The present study found that each of the three types of intellectual capital to be associated with increased business performance. Human capital exhibited positive and weak relationship with performance lending no support to the widespread anecdotal evidence suggesting that talented people are critical ingredient in developing and delivering superior products and services that generate high consumer demand. Employees have argued for quite some time that many of the fastest growing companies over the past several decades (Pepsi, Coca Cola) achieved their phenomenal growth and competitive advantage through their talented people but in other companies especially public sector, the employees say that there is a lack interest to the human capital as a main resource to achieve a competitive advantage.

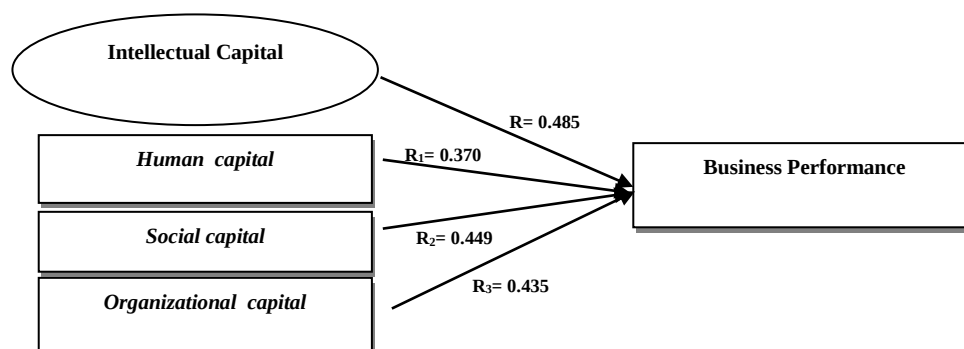
Social capital is regarded as the strongest predictor of performance. Such a strong linkage between social capital supports that knowledge tied up in relationship among employees, customers, suppliers, alliance partners, and the like tends to lead to process and product innovations, better problem solving which tends to increase production and service delivery efficiencies as well as customer satisfaction. Social capital also enable organisations to utilize their knowledge base by leveraging it across the entire organisation and thereby reduce redundancies, effort duplication and ultimately organisational costs but the study found social capital is poorly related with all the components of intellectual capital. So collaborative management and consensual decision making is in preaching only. It is yet to be recognised and practiced.

The relationship between organisational capital and performance become statistically significant in the study. Since individuals form the basis of organisational level of learning and knowledge accumulation (Organisational Capital) and institutionalisation of knowledge and knowledge sharing is becoming highly encouraged in Algerian companies, there is strong co-relation between organisational capitals with its bottom line.

This study shows that the Algerian companies as whole has interested to the tangible assets more than the intangible assets.

The results are summarized in the figure 2:

Figure 2: Summaries results (Model 1)



VII. Conclusion

This study shows that the Algerian companies as whole has interested to the tangible assets more than the intangible assets.

These results refer the necessary to increase the awareness of the manager, the important of the component of the intellectual capital in result to increase the business performance. The results are in line with J. Choudhury (2010).

When asked about the understanding of intellectual capital, the employees (especially branch managers) agreed that there is a weak awareness about the term of intellectual capital and his component among the employees in different sectors. So they must have an important to the knowledge and emphasis knowledge contribution of employees. However, they needed to give higher priority to the management of intellectual capital by taking a holistic view of all sources of knowledge that had the potential to add value and for the future positioning of the business units.

References

- [1]. Brooking, A. (1996), Intellectual Capital :Core Assets for the Third Millennium Enterprise, Thomson Business Press, London.

- [2]. Choudhury .J (2010) Performance Impact of Intellectual Capital: A Study of Indian it Sector. International Journal of Business and Management Vol. 5, No. 9.
- [3]. Edvinsson,L. &Malone,M., ,(1997),“Intellectual Capital : Realizing Your Company’s True Value by Finding Its Hidden brainpower” Harper Collins Publishers Inc., New York.
- [4]. Guthrie, J., and R. Petty, 2000, “Intellectual Capital: Australian Annual Reporting Practices”, Journal of Intellectual Capital, 1, 3.
- [5]. Huselid MA (1995) The impact of human resource management practices on turnover, productivity, and corporate financial performance. Academy of Management Journal 38(3).
- [6]. Khani, Amir Hosain Amir; Ahmadi, Freyedon; Homayouni, Golamhusain (2011) The Impact of Intellectual Capital on performance of Iranian food firms Interdisciplinary Journal of Contemporary Research in Business;, Vol. 2 Issue 10.
- [7]. Mark A. Youndt and Scott A. Snell,(2004), Human Resource Configurations, Intellectual Capital, and Organizational Performance.Journal of managerial Issues .Vol 16 , Number 3.
- [8]. Roos, J., Roos, G., Dragonetti, N.C. and Edvinsson, L.(1997).Intellectual Capital: Navigating in the New Business Landscape London: Macmillan.
- [9]. Sharabati A, Nourband.A & Shamari. N , (2013), The Impact of Intellectual Capital on Jordanian Telecommunication Companies' Business Performance, American Academic & Scholarly Research Journal Vol. 5, No. 3, Special Issue. www.aasrc.org/aasrj
- [10]. Wilson .J ,2005; Human Resource Development:Learning and Training for individual and organizations, Bell &Bain ,Glasgow
- [11]. Yaghoubi, Nour-Mohammad Kazemi, Mehdi, Jamshid Moloudi (2010).Review relationships between organizational intelligence and intellectual capital, Institute of interdisciplinary business research vol 2 No7
- [12]. Youndt, M.A., Snell, S.A., Dean, Jr. J.W. and Lepak, D.P. (1996), ‘Human resource management, manufacturing strategy, and firm performance’, Academy of Management Review , vol. 39, no. 4.