Intellectual capital and Business Performance in Algerian Companies

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Abstract: *Purpose* – The purpose of this study is to empirically test the relationship between intellectual capital (i.e. human capital, structural capital, relational capital) and business performance within different economic sectors in Algeria. *Design/methodology/approach* – A valid research instrument was utilized to conduct a survey of 120 employees in different manager levels of Algerian companies. *Findings* – A correlation is conducted to ascertain the validity of the measures and models. Statistical support was found for the hypothesized relationships. *Research limitations/implications* – The findings offer valuable insights on the generalizability of intellectual capital in a novel research setting. *Practical implications* – Intellectual capital measurement is of primary interest for senior executives of pharmaceutical firms in Jordan. *Originality/value* – The research reported is among only a few to investigate the issue of intellectual capital in Jordan and the first to study Algerian firms.

Introduction:

Awareness of knowledge as a distinct factor of production within an organisation is gaining momentum. After maximazing production factors such as land,building, equipment, inventory and financial resources(tangible assets),companies have companies have discovered that the so-colled intangible (hidden) asset of knowledge can play a vital role in helping them obtain a sustainable competitive advantage. Thus with the arrival of the knowledge era,the central role of physical capital in organisations has gone forever.

The sum of everything everybody knows in a company that gives it a competitive edge is known as intellectual capital (IC).

Intellectual capital has become a critical issue within organisations for a number of reasons:

- Employees with the most intellectual capital are likely to find work opportunities in a wide variety of companies and will become volunteers;

- Most assets depericiate when obtained,while intellectual capital appreciates;

- As the service economy grows, the importance of intellectual capital increases; and

- The globalization of the economy is putting pressure on companies to increase adaptability and innovation.

Further reasons,for the importance of intellectual capital include the numerous that a company can derive from its presence,namely:

o Improved efficiency of people and operations;

o Increased responsiveness to customers

o Improved decision making
o Enhanced employee satisfaction;
o Savings in research and development costs;
o Reduced duplication of efforts;and
o Faster innovation of new products.

In view of the important role that intellectual capital can play within an organisation, we try to investigate the relationship between intellectual capital and business performance in Algerian companies.

1.   Literature Review:
1.1.   Intellectual capital:

The term "Intellectual Capital" (IC) was first published by John Kenneth Galbraith in 1969 (Hudson, 1993), but Stewart (2001a) claimed the first use back to 1958 when he started intellectual capital study with Itami who later published *Mobilizing Invisible Assets* in Japanese in 1980. In general, IC means more than just "intellect as pure intellect" but also a degree of "intellectual action" (Bontis, 1998; Feiwal, 1975). In that sense, intellectual capital is not only a static intangible asset per se, but an ideological process. It is the kind of movement from "having" knowledge and skills to "using" knowledge and skills.

Although historically the intellectual capital concept has been discussed for some decades, there is no consensus to its definition yet. One definition that has arisen from the Skandia team was that the intellectual capital represents the domain of knowledge, of practical experience, of organizational technology, of customer relation, of professional

skills, that provides the company with relevant advantage in its market.

Intellectual capital management (ICM) is defined as the direction of the value-driven transformation of human and relational capital into the structural capital of the organization (Lynn, 1998). Corporate processes (e.g., recruitment, training and compensation) help foster creativity and innovation. Together with appropriate technology and structural capital they create and share organizational knowledge which, when exploited and applied to external knowledge and relational capital, produces corporate competitive advantage.[1]

Gratton and Ghoshal (2003) argue that intellectual capital is part of human capital, that is, human capital subsumes intellectual capital, and also includes within it social capital and emotional capital. Roos et. al. (1997) Intellectual capital includes all the processes and the assets which are not normally shown on the balance sheet and all the intangible assets (trademarks, patents and brands) which modern accounting methods consider... it includes the sum of the knowledge of its members and the practical translation of his/her knowledge. Bontis) 1998(defines IC as the pursuit of effective use of knowledge (the finished product) as opposed to information (the raw material). Olve et al.(1999) regarded IC as an element of the company's market value as well as a market premium. Brooking(1996) defines IC as the term given to the combined intangible assets of – market, intellectual property, human-centred and infrastructure – which enable the company to function [2].

Union Fenosa(1999), 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.[3]

1.2 Component of intellectual capital:

There are different views about determining the component of intellectual capital in the article concerned. According to Edvinsson and Malone (1997), Intellectual Capital takes three basic forms: human capital, structural capital, and customer

capital. Human capital includes knowledge, skills, and abilities of employees. In Figure (1)

Brooking (1996) suggests that Intellectual Capital is comprised of four types of assets: (i) market assets, (ii) intellectual property assets, (iii) human-centered assets and (iv) infrastructure assets.

Market assets consist of such things as brands, customers, distribution channels, and business collaborations. Intellectual property assets include patents, copyrights, and trade secrets. Human centered assets include education and work-related knowledge and competencies. Infrastructure assets include management processes, information technology systems, networking, and financial systems.

Generally intellectual capital consists of three types of capital; human capital, structural capital and relational capital. Intellectual capital can be located in its people, its structures and its relation with its stakeholders.

- ### *Human capital*:

Human capital refers to the value of knowledge, skills and experience held by individual employees in a firm. (Edvinsson & Malone, 1997). [4] It is the intangibles that rest within the minds of individuals, such as knowledge, competencies, know how, ect. Bontis (1999) argues that human capital is important because it is a source of innovation and strategic renewal, whether it is from brainstorming in a research lab, daydreaming at the office, throwing out old files, reengineering new processes, improving personal skills or developing new leads in a sales rep's little black book.

The essence of human capital is the sheer intelligence of the organisational member.

- ### *Structural Capital:*

Structural capital includes all the non-human storehouses of knowledge in organisations which include the databases, organisational charts, process manuals, strategies, routines and anything whose value to the company is higher than its material value. Roos et al. (1998) describe structural capital as "what remains in the company when employees go home for the night".

Structural capital arises from processes and organizational value, reflecting the external and internal foci of the company, plus renewal and development value for the future. According to Bontis (1998), if an organisation has poor systems and procedures by which to track its actions, the

[1] S. Saudah, M. Tayles & R.Pike, **Working paper: The implications of intellectual capital on performance measurement and corporate performance,** p 15

[2] Bontis. N, William Chua Chong & Stanley Richardson, **Intellectual Capital and Business Performance In Malaysian Industries**, Bontis. N, William Chua Chong & Stanley Richardson, Journal of Intellectual Capital, 2000.

[3] Patricia Ordonez de pablos, **Evidence of intellectual capital measurement from Asia**, **Europe and middle East**, journal of intellectual capital, Vol 3,N 3,2002.p 288

[4] Ngah. R & Abdul Razak. I, **The relationship of Intellectual Capital**, **Innovation and Organizational Performance**: **a Preliminary Study in Malaysian SMEs**; International Journal of Management Innovation Systems. Vol 1,N 1, 2009, p 3

overall intellectual capital will not reach its fullest potential. Organisations with strong structural capital will have a supportive culture that allows individual to try new things, to learn, and to fail. Structural capital is the critical link that allows IC to be measured at the organisational level of analysis.

This component of intellectual capital is the infrastructure firms develop to commercialize their intellectual capital (Edvinsson and Sullivan, 1996). It provides a platform for people to be creative (Stewart, 2000).

While firms do not own human capital that which remains in the organization after employees go home at the end of the working such as the organization's process, information systems, databases ect (Cohen and Kaimenakis 2007), structural capital belongs to the organization as a whole. It can be reproduced and shared. A good structural capital will provide a good environment for rapid knowledge sharing, collective knowledge growth, shortened lead times and more productive people (Stewart, 2000).

▪ *Relational capital:*

The relationships the organization has established with resource providers,customers and other key stakeholders, relational capital represents the potential an organization has due to ex-firm intangibles. These intangibles include the knowledge embedded in customers, suppliers, the government or related industry associations (Bontis,1998).[5]

It is the ensemble of intangible values matured in the relations of the firm with its external environment (clients, distributors, suppliers, investors).

▪ It also can be contain **Social capital** that defines as the network of relationships that individuals have throughout the organization; such relationships are critical in sharing and leveraging knowledge and in acquiring resources. Social capital also can extend beyond the organizational boundaries to include relationships between the firm and its suppliers, customers, and alliance partners[6].

1.3 The measurement of intellectual capital:

The famous saying " what you manage must be able to measure.and what you measure you must be able to manage " also applies to intellectau capital. Reaserchers, consultants accountants and mangers

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[5] Bonitis.N, **Intellectual capital: an exploratory study that develops measures and models**,Management decision, 1998 vol 2 n 36.p67

[6] Lumpkin Eisner.D, **Strategic Management:Text and Cases**,McGRAW-Hill International Edition,2008,p 118

soon discovered,however,that the traditional financial accounting measures such as return on investment and earnings per share, could not be adequately utilized for intellectual capital, as they were out of step with the skills and competencies companies were trying to master.

Numerous suggestions were made to solve this problem, that we can summarized as fallows by the different ways to measure IC:

1.3.1 Kaplan and Norton model: the balanced Scorecard

This model was developed between the years 1992 and 1996.It as not a model specifically created for measuring the intellectual capital of an organization; rather,it tries to be a corporate management system and measure the results obtained at the heart of the organization,integrating for the first time the concept of intangible assets.

In their balanced scorecard approach, Kaplan and Norton allow managers to look at the business from four important perspectives, namely (figure:2):

-a customer perspective-how do customers see us?

-an internal perspective – what must we excel us ?

-an innovation and learning perspective – can we continue to improve and create value?

-a financial perspective –how do we look to shareholders?

To activate the scorecard, managers must translate the company goals relating to the four perspectives into specific measures that reflect the factors that really matter.
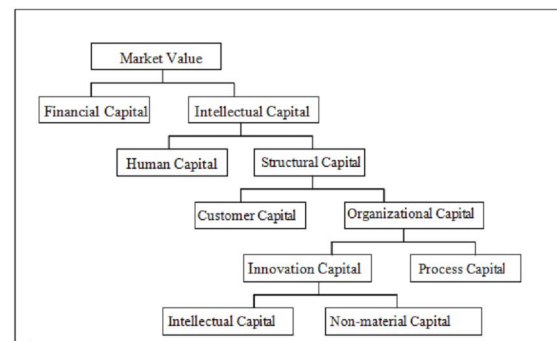

Figure 1. Edvinsson's Categorization of Capital[7]

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[7] L. Edvinsson and M. S. Malone, "**Intellectual Capital: Realizing Your Company's True Value** by Finding Its Hidden Brainpower", Hzarper Business, New York, 1997.
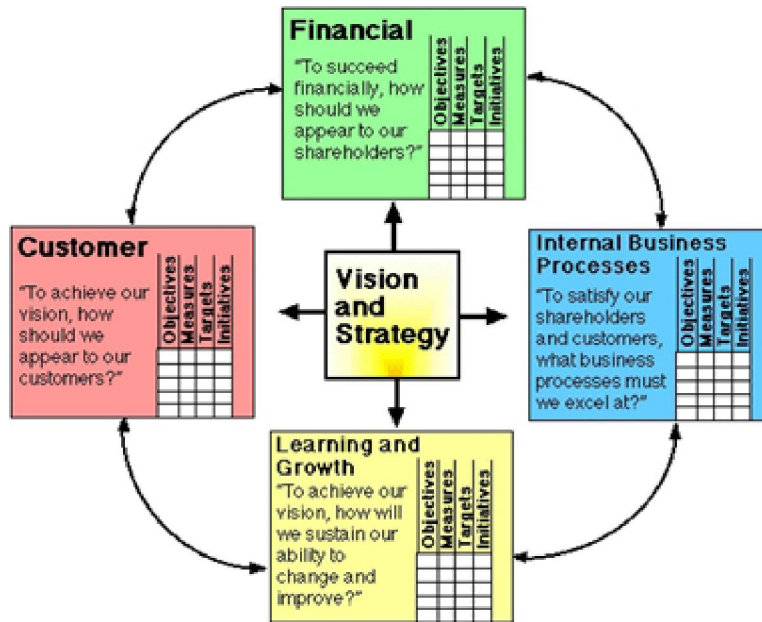
Figure 2: Balanced Scorecard
Source: Kaplan and Norton (1996)

1-3-2 Skandia Navigator:

According to Skandia's model, IC reporting was categorized into human capital and structural capital (Edvinsson and Malone, 1997).

Skandia navigator is an important tool, it divides the market value into financial capital and intellectual capital,on focusing on the breakdown of the latter.

As can be seen in Figure 2, five areas or focuses exist where the company centres its attention, and among those areas,the value of intellectual capital of the organization within its environment is included.

There are more than 100 indices recommended in the Skandia model.

Figure (3):Skandia Navigator

1.3.3 Human resource accounting:

From Hermanson's classic study in 1964, how to evaluate assets has caused number debates among accounting and human resource theorists.the objective of HRA is to quantify the economic value of people to the organization.(Sackmann et al.,1989)

to provide input to managerial and financial decisions. Reasearchers have proposed three types of HRA measurment models: HR value models,cost models and monetary emphasis models.

Empirical study:

1.2.   Objective and methodology:

The model of this study is translate from the study of A.Sharbati; S. Djawd & N. Bontis (2010) that examine the interrelation between the intellectual capital and business performance in the pharmaceutical sector of Jordan.

Intellectual capital in this study was defined as the total stocks of all kinds of intangible assets, knowledge, capabilities, and relationships, etc, at employee level and organization level, within a company.

The aim of this study is to investigate the relationship between intellectual capital and business performance in the age of globalization.

We referred to literatures of the past and classified intellectual capital into human capital, structural capital and relational capital. "Human capital" in this study was defined as the summation of employees' knowledge, skills, capabilities, experience, attitude, wisdom, creativities, and commitment, etc and was embedded in employees, not organizations. A company can increase its innovation performance through its human capital, "structural capital" was defined as the stocks of organizational capabilities, organizational commitment, knowledge management systems, reward systems, information technology systems, databases, managerial institution, operation processes, managerial philosophies, organizational culture, company images, patents, copyrights, and

trademarks, etc, within a company; it is embedded in organizations, and thereby cannot be taken away by employees. Relational capital represents all the knowledge embedded in relationships with external parties such as customers, suppliers, partners and other external stakeholders.

The purpose of this study was to investigate the relationship of intellectual capital in the Algerian companies upon their innovation performance. The hypotheses are described as follows:

H_1: Intellectual capital is positively associated with business performance in Algerian companies.

H_2.Human capital is positively associated with business performance in Algerian companies.

H_3: Structural capital is positively associated with business performance in Algerian companies.

H_4: Relational capital is positively associated with business performance in Algerian companies.

1.3.   Data Collection and Samples:

This study tested hypotheses with a questionnaire survey that was conducted in Algerian companies. The data for this study was collected throughout a field survey. There were 17 organizations in different sectors in Algeria.

The entire population was chosen to explore the topic of intellectual capital, thus negating any need for sampling. The survey unit of analysis was composed of top and middle managers and the exucters drawn from the Algerian companies population. Financial information was also collected from annual reports, journals, books, and trade magazines. Primary information was also collected from expert interviews, and a pilot study conducted by the research team.
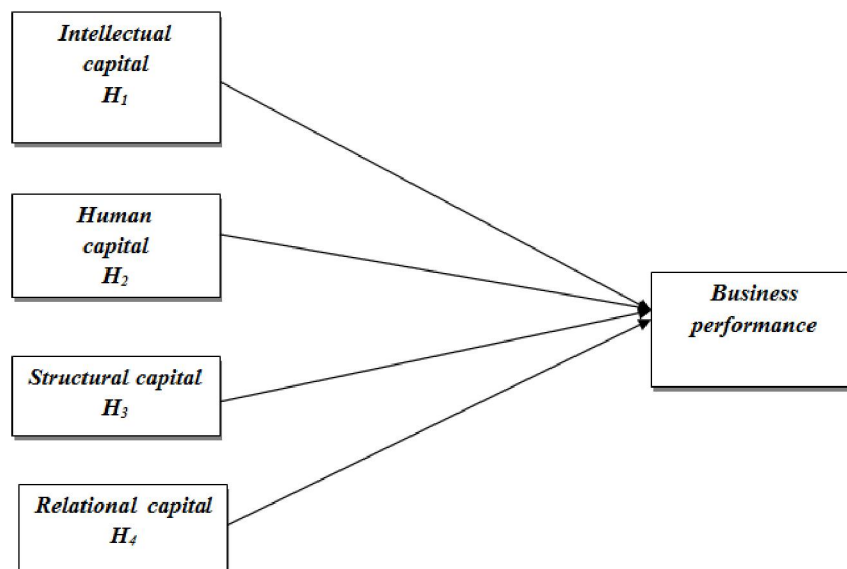

Figure. 2: Conceptual model

2.3 Results:

In order to test for the normal distribution of response data, 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), Bollen et al.(2005) and Bin Ismail (2005).; as shown in the table: 1

Table -1: The test of the reliability

Items	Cronbach's alpha
Human capital	0.8202
Structural capital	0.8886
Relational capital	0.8167
Business performance	0.7846

Pearson's bi-variate correlation coefficient was used to test the relationship between independent and dependent variables. The result showed that the intellectual capital variables and sub-variables had a weak and significant relationship with innovation performance. An ANOVA test was then used to analyze respondents' characteristics related to gender, age, education, role and experience.

The data for the study were collected from 120 respondents from various different services companies. As per the table-2 demographic profiles of the respondents where male participants in the study was 24 where female participants consisted 13 of the total population. The almost of the respendent have the licence diploma, it consists73%. Age wise distribution depicts 31-40 age group dominates in the

study consisting of more than 40% of the total sample. The respondents having more than 5 years of experience at current organization is very well present in the study consisting of 53.8% of the total sample.

Table2:Respondents profile

Parameter	Group	#	%
Sex	Male	82	68.3
	Female	38	31.7
Age	20-30	32	26.7
	31-40	48	40
	41-50	33	27.5
	> 50	7	5.8
Study level	Secondary	26	21.7
	License	91	75.8
	Post graduate	3	2.5
Role	General manager	6	5
	Trade commercial	17	14.2
	Account	16	13.3
	Branch manager	18	15
	Others	63	52.5
Experience	> 5years	46	38.3
	<5 years	47	61.7
Total		120	100

Table 3 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. The only item below the mid-point was the use of intellectual property at 2.80.

Table- 3: Statistical results of summary variables

	Mean	Std.dev	t-value
Intellectual capital	**3.53**	**0.77**	**29.287**
Human capital	**3.80**	**0.972**	**46.632**
- Learning and education	4.06	0.751	62.109
-Employees satisfaction	3.68	1.088	37.096
- Innovation and creation	3.67	1.078	40691
Structural capital	**3.52**	**1.053**	**34.823**
-Systems and programs	3.56	1.070	30.955
- Research & development	3.58	1.097	35.794
-Intellectual property rights	3.42	0.994	37.721
Relational capital	**3.86**	**0.924**	**46.067**
-Customers satisfaction	3.94	0.887	48.821
- Knowledge about partners, suppliers and customers	3.87	0.894	47.724
- Alliances, licensing and agreements	3.78	0.992	41.658
Business performance	**4.14**	**0.690**	**64.263**
-Productivity	3.99	0.693	57.739
- Profit	4.19	0.699	65.933
- Market value	4.26	0.678	69.117

As defined in table-4,the regression equation of the innovation performance with human capital, social capital and structural capital.

The regression equation of innovative performance component with human capital, social capital and structural capital clearly depict the model is poorly fit with R less than 0.5. Social capital is weak in explaining the relationship with R value 0.114.

The effect of human capital, social capital and structural capital on innovative performance are not significant with R value 0.150, 0.114 and 0.123 in this arrangement and intellectual capital as a whole has a little influence on innovative performance with R value 0.086.

Table 4: Business performance Vs intellectual capital

	Intellectual capital	*Multiple R*	*R^2*	*Std.Error*
Business Performance	*Human capital*	0.383	0.147	0.055
	Structural capital	0.391	0.153	0.048
	Relational capital	0.550	0.302	0.057
	Intellectual capital	0.495	0.245	0.020

The results related to path analysis showed that the three sub-constructs of intellectual capital together have a positive and weak relationship with business performance.

Table 5 represents a correlation matrix across all variables with only the component of intellectual capital and intellectual capital values being statistically significant ($p < 0.01$)

Table 5:Correlation matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Learning and education													
2.Employees satisfaction	0.746												
3.Innovation and creation	0.583	0.712											
4.Human capital	0.830	0.911	0.900										
5.Systems and programs	0.546	0.538	0.507	0.587									
6.Researchand development and	0.543	0.645	0.563	0.651	0.686								
7.Intellectual property rights	0.529	0.624	0.616	0.663	0.639	0.694							
8.Structural capital	0.610	0.670	0.629	0.710	0.907	0.865	0.873						
9.Customers satisfaction	0.435	0.473	0.456	0.506	0.531	0.487	0.472	0.565					
10.Knowledge about partners, suppliers and customers	0.289	0.410	0.480	0.461	0.469	0.272	0.500	0.487	0.606				
11.Alliances, licensing and agreements	0.385	0.399	0.477	0.472	0.550	0.48	0.523	0.592	0.497	0.480			
12.Relational capital	0.722	0.804	0.799	0.875	0.817	0.778	0.826	0.915	0.714	0.676	0.681		
13.Business performance	0.350	0.285	0.360	0.383	0.369	0.291	0.358	0.391	0.445	0.516	0.384	0.495	

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

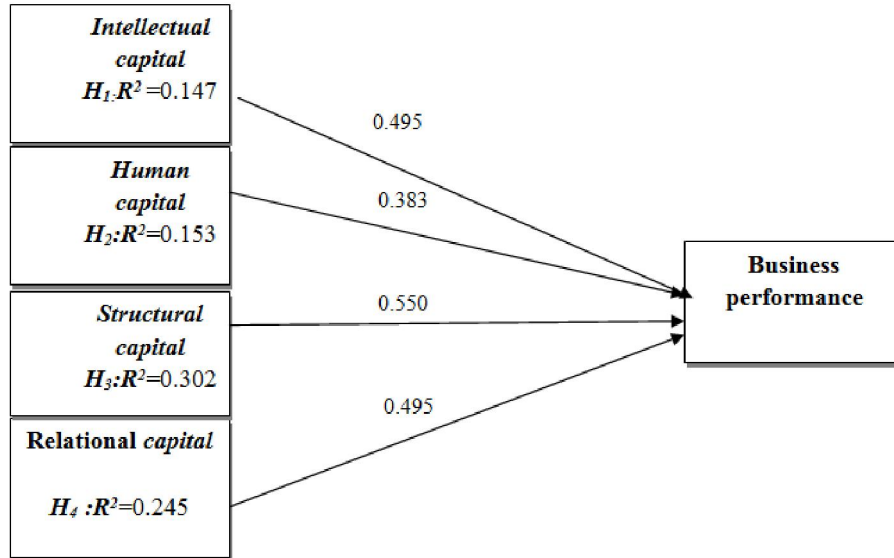All the results are summarized as follow:

Figure. 3: The summarized of the results

1.4.   Discussion

The present study found that each of the three types of intellectual capital to be associated with increased business performance. Human capital, structural capital and relational capital exhibited weak relationship with business performance. The results of this study have shown that there is in fact strong and positive evidence that Algerian firms are managing intellectual capital effectively and that in turn is influencing business performance positively.

Human capital exhibited strong relationship with performance lending 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. Hence the elements of human capital management are central to the successful implementation of most other management initiatives and achieving the firm's strategic goal. Social capital is regarded as the strongest predicator of performance.

The relationship between structural capital and performance become statistically significant in the study with weakness relationship.Since individuals form the basis of organisational level of learning and knowledge accumulation (Structural Capital) and institutionalisation of knowledge and knowledge sharing is lowly encouraged in Algerian industries, there is weak co-relation between structural capitals with its bottom line.

This 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 and this is important to meet the challenge of the globalization.

4.Conclusion:

The management of intellect lies at the heart of value in the current "knowledge era" of business. Unfortunately, methods of measuring and evaluating intellectual capital have been slow to develop. There is an extremely limited literature on the study and management of intellectual capital.

Under the competitive circumstances with knowledge as the vital capital, an enterprise must strive for a dominant position for survival and development in the learning competition among entreprises. IC management has already become the core of enterprise management in the knowledge economy era.

In the arabe world we must have a consideration and awareness of the IC in the companies to confront the different challenges in the environment because only with a thorough understanding of the IC, an effective IC management can become possible.

Finally, we suggest to have a measurement system that can apply the knowledge management of each department and to the assessment of their employees achievements by setting the aims in enhancing the IC for each department and each employees in Arabe companies.

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