

**BUILDING A MODEL TO MEASURE THE IMPACT OF
MANAGING INTELLECTUAL CAPITAL AND IT'S IMPACT ON
OF THE EDUCATIONAL ORGANIZATIONS PERFORMANCE
DEVELOPMENT
CASE STUDY: LUMINUS TECHNICAL UNIVERSITY COLLEGE
(LUMINUS EDUCATION)**

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Abstract

This study aimed to investigate the impact of managing intellectual capital in development of organizations performance: case study Quds college .To achieve study objectives a questionnaire we designed according to study hypotheses. Study population consisted of all academics, directors, head sections and technical's in Quds college .A random sample totaling 140 respondents were selected. The study used the analytical descriptive approach. Statistical Package for Social Sciences – SPSS was used to analyze the collected data. This study concluded a set of results including:

- There is a statistically significant impact of intellectual capital management with its dimensions (human capital, structural capital, relationship capital, intellectual assets capital, and developing and innovation capital) in development of Quds college performance (Luminous Education).
- There is a statistically significant effect at the abstract level ($p \leq 0.05$) of Quds College (Luminous Education) environment in improving the impact of intellectual capital in the development of Quds College (Luminous Education) performance.

The study recommends the following

Quds College has to pay attention to its intellectual capital management and to maintain its assets due to its important role in raising Quds college performance efficiency

* Luminus Technical University College

- Quds college has to deal with all intellectual capital management dimensions and to consider it as an integrated frame with its five dimensions and not to disregard any one for the purpose of utilizing the intellectual capital to improve performance levels

Key Words: Intellectual capital, human capital, structural capital, relationship capital, intellectual assets capital, developing and innovation capital, Organizational Performance, Organizational Environment.

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Introduction:

In the past decades, the world has witnessed a tremendous revolution in information technology, communications, and many inventions and innovations that have emerged as a natural result of productive knowledge accumulation. As a result, business organizations environment is facing multiple challenges of intense competition and rapid change.

Due to modern business environment dynamism because of information and technology revolution, the demand for skilled workers with advanced expertise, skills and distinguished competencies in tasks performing and excellence has increased significantly. The great challenge for business organizations is their ability to develop their human resources and invest in attracting new distinguished resources to meet challenges imposed by the third millennium and the required for business organizations to generate knowledge, develop and invest in a way that achieves organization's operations efficiency to ensure performance development . Intellectual Capital represents a competitive advantage and added economic value that organizations seek to attract, maintain and develop.

Intellectual capital dimensions which constitute success strategy in the future, and a representative of organization strength and ability to succeed, compete and achieve strategic objectives designed that knowledge management seeks to achieve, and develop their practices to support knowledge acquisition of in the organization and thus the development of organization performance.

:The importance of the study

The importance of this study stems from identifying the importance of intellectual capital management effective role in developing Lumenus Technical University College (Lumenus for Education) through achieving the basic competency inherent in intangible resources. So the importance stems from:

- Explaining the effective role of intellectual capital management in its previously mentioned dimensions in the development of performance at Lumenus University of Technology.
- Trying to conclude a set of results and recommendations that can be taken into account by higher departments of Lumenus University of Technology and other Jordanian colleges to invest in intellectual capital in order to enhance their organizational performance and development.

Objectives of the study:

This study aimed to:

- To measuring the impact of intellectual capital management on the development of Lumenus University Technical College - Lumenus for Education - as one of the Jordanian community colleges operating in the field of education and training.
- Increasing the scope of scientific knowledge in the field of management and investment in intellectual capital.
- Building a proposed model for the management of intellectual capital.

The problem of study:

The study problem is to measure and analyze the impact of intellectual capital management on the development of Lumenus Technical College (Lumens for Education) as one of the Jordanian organizations that operate in higher education field, and to know the impact of intellectual capital management on Lumenus University Technical College performance development in its internal and external environment. And building a proposed model for intellectual capital management, since intellectual capital, investment, management and development needs to be further explored and enriched in the environment of Jordanian higher education institutions in particular and in the environment of Arab higher education institutions in general.

Study Questions:

Based on above, the study problem can be formulated with the following questions:

-Is there an impact of intellectual capital management in Lumenus University Technical College performance development (Lumenus Education)?

-Is there an impact of Lumenus University's technical environment in improving impact of intellectual capital management in Lumenus University Technical College performance development?

Study Hypotheses

The purpose of the study can be achieved by testing the following hypotheses:

The first hypothesis

HO1: There is no statistically significant impact at ($p \leq 0.05$) level of intellectual capital management with its dimensions (human capital, structural capital, relational capital, capital of intellectual assets, capital of innovation and development) on Lumenus Technical College (Lumenus) performance development

The second hypothesis

HO2: There is no statistically significant impact at ($p \leq 0.05$) level of Luminus College of Technology (Lumenus Education) environment in improving the Impact of intellectual capital on Lumenus Technical College performance development (Lumenus for Education.)

Theoretical framework**Preface**

Recognizing the importance of intellectual capital and the value it can generate. we will encourage educational and training organizations to develop a plan to manage their intellectual capital. Many researchers have presented different models for intellectual capital management. The models of intellectual capital management developed by a number of researchers are presented and analyzed, and then the proposed model for the management of intellectual capital .is presented in this study

The intellectual capital models discussed refer to the diverse methods used by researchers to illustrate how intellectual capital is managed in organization, which helps in generating value for intellectual capital in order to enhance competitive advantage and performance development. Through the discussion an attempt will be made to build the proposed model for intellectual capital management of as one of the main objectives of this study.

Quinn et al., (1996: 74) suggested a model for intellectual capital management. They pointed out the requirements for model success as follows:

1. Enhancing capacities to solve problems by acquiring knowledge through computer systems and software.

2. Overcoming professional's resistance to share knowledge.

3. Moving organization towards intellectual assets, as organizations aim to enhance the return on investment through their intellectual assets.

4. Inverted organizations: it refers to a shift from a traditional hierarchical organizational structure to an organizational structure that allows organizations to manage their intellectual capital with flexibility with which professionals can enjoy full freedom and enable them to make decisions themselves as they are true organization. Leaders

- 5 - Formation of intellectual networks: organizations use what is known as spider webs through which teams are formed in which an innovative creative group interact and learn from each other, in order to share knowledge, especially when problems are complicated where this network begins with all its members to address a particular problem and solve these the problem with the end of the task, it is solved in a sequential manner, and is reconfigured to accomplish other tasks and groups, and these intellectual tissues have distinct characteristics:

- Harmonization of team members.

- High negotiating capacity to convince managers and decision-makers of proposed ideas and their importance in reducing organization threats

- Real interaction to produce ideas that match with organizations needs and requirements.

- Ability to transform proposed ideas for practical implementation.

2-2 Determination Roles of Intellectual Capital (Harrison & Sullivan, 2000. 240)shown in Fig. 1-2, where two authors indicate in this model to "defensive" and "offensive" roles played by capital Intellectual. The process of intellectual capital managing in the model begins with organization vision, which expresses the situation in which it operates and determines a strategy

by which the value of intellectual assets is maximized, in addition to the role played by intellectual property, which represents "current value". Later on the management then considers the appropriate means and methods that organization can effectively implement to manage its intellectual assets

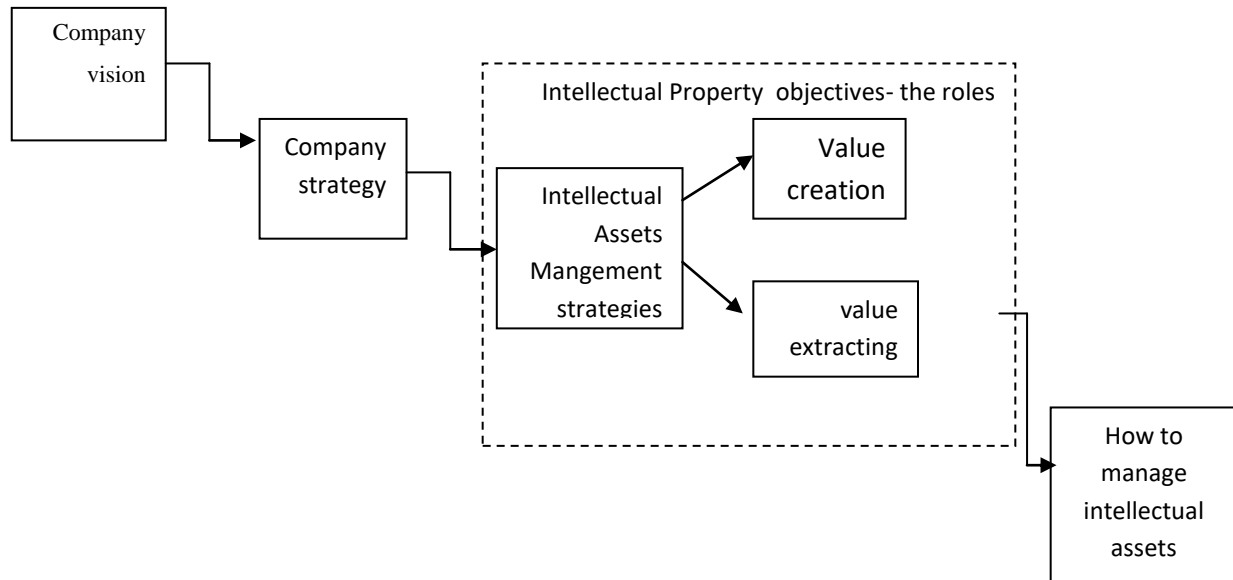
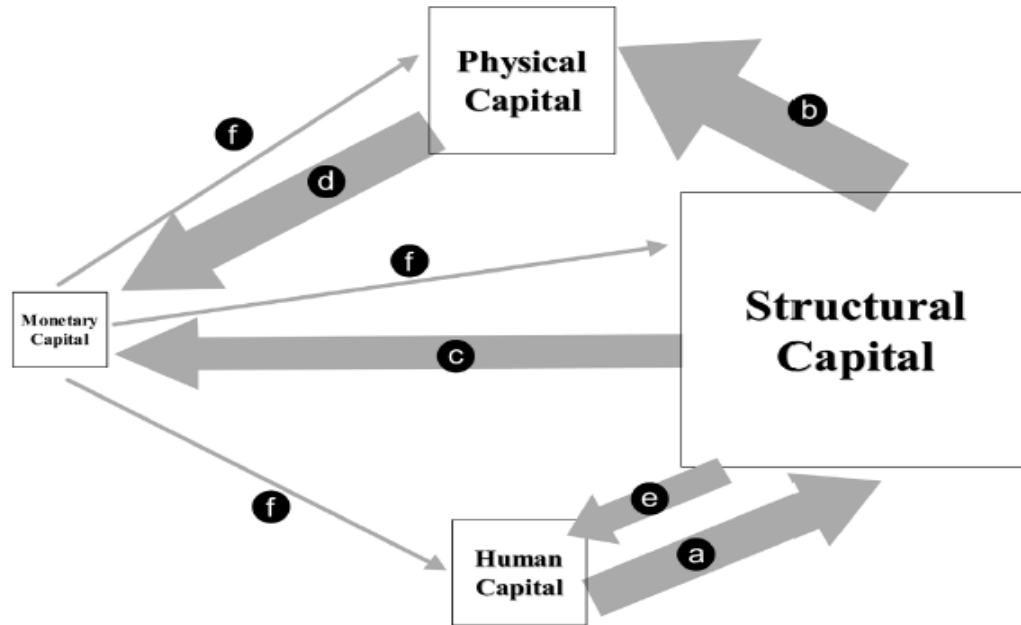


Figure 1-2: Determination of Intellectual Capital roles

Source: Harrison and Sullivan.(2000). Profiting from intellectual capital: learning from leading companies. Journal of intellectual capital, Fig. 2, p.38.

2.3 The APiON Navigator model (Peppard and Rylander, 2001, p: 230), shown in Figure 2.2, in which they focus on value creation, value extraction and growth strategy implementation. The model shows "four forms of intellectual capital, where arrows represent the transformations between these forms, squares and arrows show the relative importance of value creation, and as long as square or arrow is large, the relative importance is large



." Figure 2-2 Vector model APiON Navigator

Source: Peppard and Rylander (2001). Leveraging intellectual capital at APiON. Journal of intellectual capital, Fig. 1, p. 231

The basic aspect of the APiON model is the transformations between structural capital and material capital. Peppard & Rylander (213) mentioned that "the company has no important material assets to find the value to value, so the arrow (between structural and material capital) represents the shift in structural resources."

The extended arrow in the model from physical capital to monetary capital explains the movement in sales, and the arrow from human capital to a structure that indicates that the development of the product will be through structural capital (operations), and the arrow from structural capital to human capital shows that people working in projects increase their knowledge through knowledge creation initiatives

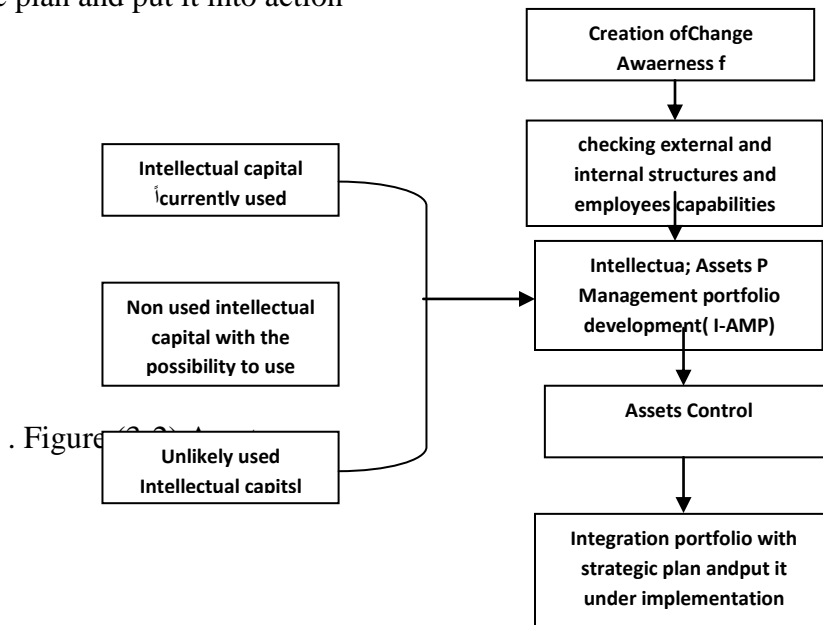
2-4 Klaila & Hall (2000) model for intellectual capital management,

Figure (3-3) In this regard, encourages the establishment of an I-AMP portfolio and provides ." .

five steps to develop it:

Step 1: Awareness and recognizing the need for change, Step 2: Examine the relationships between internal structures and organization's capabilities Step 3: starting by developing

intellectual; asset management portfolio by using the following three matrix to assist in the analysis: (intellectual capital currently applied, determining what intellectual capital is not currently used and can be used, excluding unused intellectual capital and unlikely to be used). Step 4: Establish a monitoring system and step 5: Integrate the portfolio into organization's strategic plan and put it into action



Management Portfolio (I-AMP)

Source: The model prepared by the researcher based on the I-AMP model of Klaila & Hall (2000).

The model focuses on what needs to be done to identify areas where intellectual capital is located in organization scope. With less relatively appearance of intellectual capital models of intellectual capital literature, but research in intellectual capital management intellectual has been extended to knowledge management literature, and knowledge is an integral part of intellectual capital, with the focus of some authors (egg, Carnerio, 2000).); (Firestone, McElroy 2003); (Wenger, 2004) on knowledge management, it was appropriate to discover models they set to know if it is possible to match with intellectual; capital needs.

The Carnerio (2000) model for knowledge management. This model focuses on work towards creativity and competitiveness, highlighting the importance of intellectual capital and the development of knowledge. There is an n abstract for Carnerio (2000) in Figure 2.4, which

refers to the need to coordinate capacities and preparations and to maintain, convey and elevate knowledge in order to generate value.

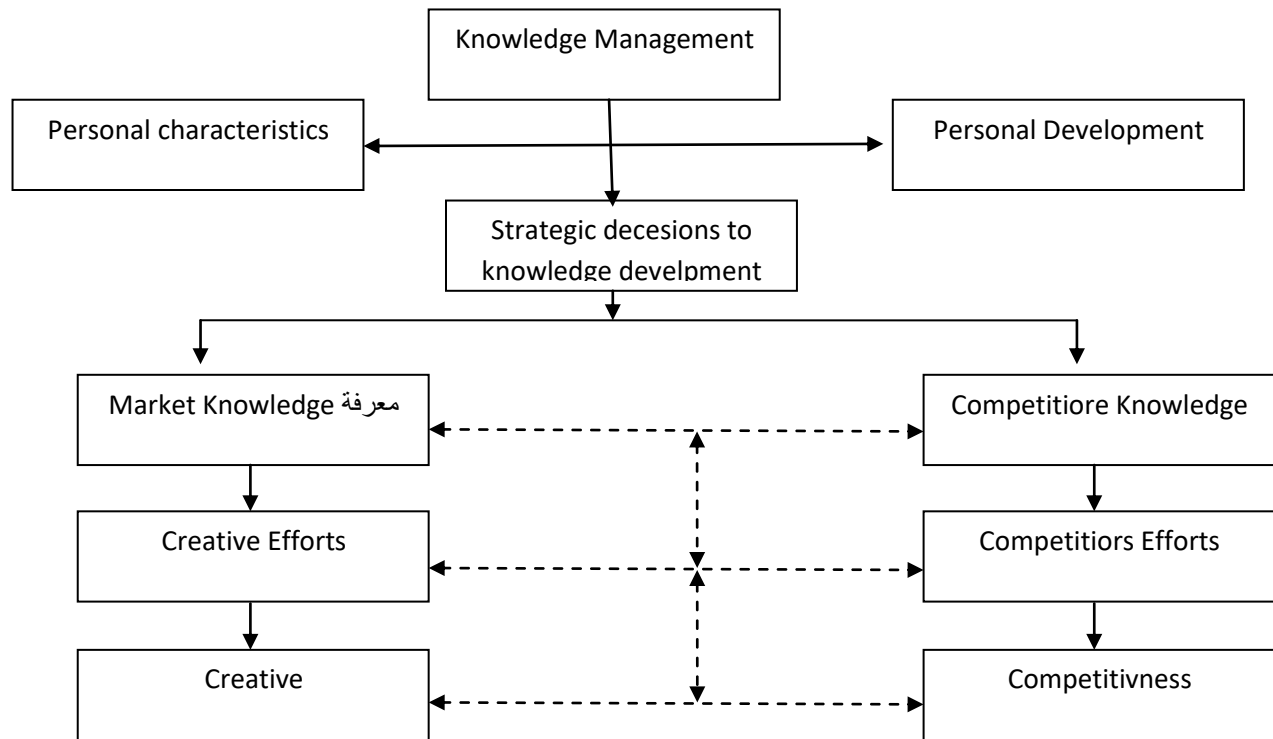


Figure (2-4) impact of "KM Carnerio" on innovation and competitiveness

Source: Alberto Carneiro.(2000).How does knowledge management influence innovation and competitiveness. Journal of knowledge management, Fig.1,p.96.

Firestone and McElroy (2003, p. 49), indicate in the model, knowledge management linkages and knowledge processing of results and provide examples of how they relate to subsequent stages, and show results in the process of processing and recall value as they can be generated through profitability, market participation and sustainability. The following model shows (2-5) results consistent with those expected as a result of the management of intellectual capital.

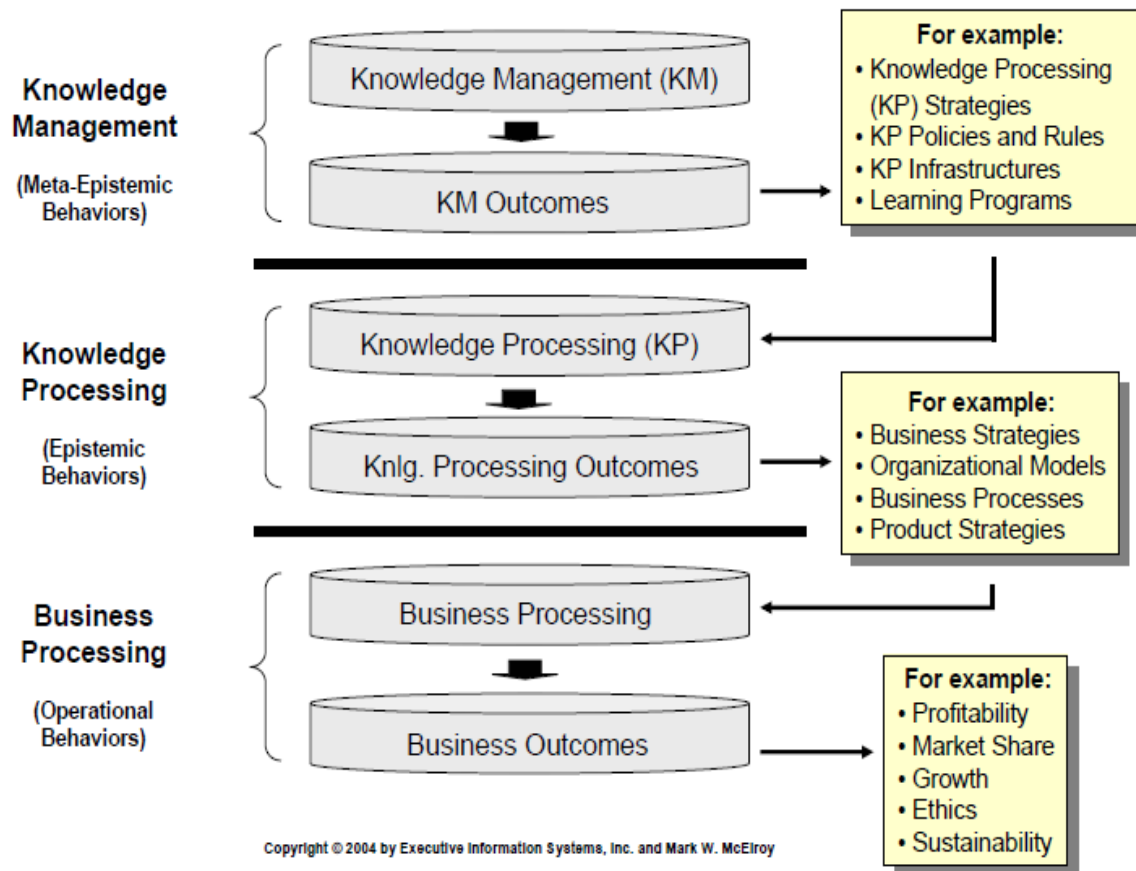


Figure (2-5) New Reference Model for Knowledge Mangement

Source: Firestone & McElroy, (2003). Key issues in the new knowledge management. Boston, Butterworth – Heinemann. Fig.6, p: 210.

Cookbook Model (Knowledge Management as a Donut, Etienne Wenger, 2004) where the model suggests to managers the need to consider knowledge management in an organizational context. Wenger (2004: 1) refers to the importance of integrating knowledge management into business processes, and illustrates the important activities of intellectual capital development such as participation, learning, performance and practice, and links them to the strategy. It also indicates that the process is characterized by reputation

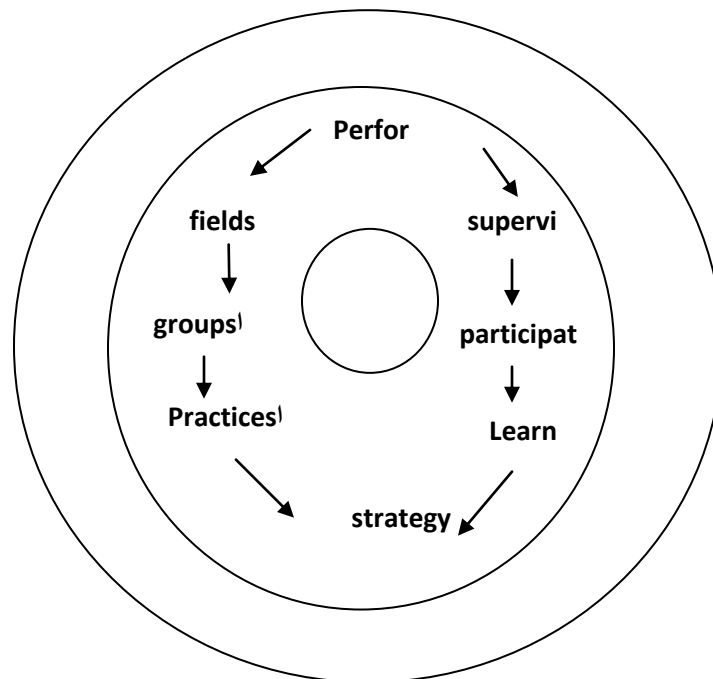


Figure (2-6) Cake Model for Knowledge Management

Source: Etienne Wenger. (2004). Knowledge management as a tough nut: shaping your knowledge strategy through communities of practice. Ivey business journal, Fig. 1, p.2.

What emerges from the examination of intellectual capital models and knowledge management is that they provide very little or even general guidance on what to consider when developing an intellectual capital management process, but there are lessons to be learned from the various methods that have been used.

When comparing between the above mentioned models, it was found that Carnerio model (Figure 2-3) suggests broader perspective, taking into account all aspects related to people, creativity and the need to know the external environment. Cake style used by Wenger's (2004) highlights the strategy but it addresses broader perspective on areas to be addressed. There is no specific reference to supplier's contribution nor does it provide any indication of any external commitments. It is a simple model that provides management with limited guidance. Models suggest researchers (Carmero, 2000, Daniel, 1997, Harrison & Sullivan, 2000, Klaila & Hall, 2000, Wenger, 2004).

The proposed intellectual capital management model

Figure 2-7 presents shows proposed model for this study, which was designed using the intellectual capital management models and knowledge reviewed in the previous paragraph. This model is expected to provide a basis for the management of intellectual capital in general.

Through intellectual capital management of any of its activities, organizations seek to demonstrate the various innovations and creations, in which they can generate value, develop their performance and increase opportunities for excellence in a dynamic environment.

The vision of the organization is the cornerstone, as it is the theoretical view through which the organization can determine its goal and the direction it will pursue to this end, and the vision .includes the need of the organization to generate and generate value

This is true on organizations of all types, both -profit and non-profit, to work more effectively within their social responsibilities, and in the case of non-profit organizations working more effectively within their social responsibility. The ability to generate and maximize value is therefore crucial to each organization, Firestone & McElroy (2003), Marr, et.al. (2004.(

To achieve the Organization's vision and to provide inputs to develop its strategy, the intellectual capital components that require management are human capital, structural capital, development and innovation capital, relational capital and intellectual assets capital. Innovations that generate value and development are the expected and desirable outcomes of intellectual capital management in organizations.

.The first dimension of the model - human capital - It is important that through human capital management to develop an environment to knowledge sharing and create knowledge that promotes ideas flow, learning opportunities through continuing education and training programs to increase staff knowledge and efficiency is an essential part of human capital management (Singe, 1990, Stewart, 1997). In order to compete effectively in work place which become an increasingly competitive, it is necessary to develop a program for continuous improvement and development of employee's capabilities and performance

The second dimension of the model - structural capital - Organization structural capital management must include a number of areas that need to be taken into account. Organizational capacity is crucial, something that cannot be easily replicated because capacity of each

organization is unique (Allee, 1997; Prahalad, & Sullivan Hamel, 1990; Spender, 1999). Organization structure affects how it works effectively. and determines how to manage systems and processes efficiently and effectively. From the perspective of intellectual capital, knowledge detailed drawing process (Davidson, & Voss, 2002; Heng, 2001; Stewart, 1997) is essential to creation of organization potential value. Firestone and McElroy (2003) model includes a structure that is deemed Organizing Model. Although reforms may be different but Firestone and McElroy (2003) models, Klaila and Hall (2000), Wenger (2004) contain an of metrics systems approach which when related to intellectual capital, difficulties that have not been fully resolved are formed.

Determination of organizational performance level of is a key activity for effective resource management. However, a number of authors indicate the importance of applying a system that helps organization to measure its intellectual capital (Boints, 2004; Guthrie, 2001; Hatten & Rosenthal, 2001; Martin, 2004; Sveiby, 1997). The only model that specifically mentions performance and implicitly mentions the need for a measurement method is the one introduced by (Wenger, 2004). Firestone & McElroy (2003) model includes business processes and systems are likely to be part of these processes.

When innovations are made, it is important to be protected by patents, trademarks, trade secrets
(and copyright (Davis & Harrison, 2001; Narayanan, 2000; Rivette & Kline, 2000)

The third dimension of the model - relational capital

This model considers that the contribution to organization intellectual capital derives from its relations with external parties. Good relations with customers are essential and crucial for organization success (Perez Bustamante, 1999; Stewart, 1997). Although networking interacts with other organizations, but t it is limited as it is important by Kanter (1996), OECD (OEDC, 1996), Teece (1998).

It is also important that we take note of other interested people in society. Organizations also look forward to engage in partnerships or joint ventures with other organizations, thereby providing an opportunity for knowledge sharing that is mutually beneficial.

The fourth dimension of the model - innovation and development capital - since it is critical to organizations success and their ability to compete and develop their performance comes through the total elements that allow organization renewal such as patents, trademarks, investment rights and talents related to publishing and conferences.

The fifth dimension of the model - intellectual assets capital (knowledge) – This dimension considers that contribution to organization intellectual capital is manifested through organization's possession of these assets (explicit knowledge independent from working person) and that tools and techniques of the working group are known and used to contribute to information and knowledge sharing in the organization during which organization culture is built.

The organizations are responsible to manage their intellectual capital with its various dimensions to maximize the value that must be gained through the revenues it receives in exchange for intellectual property rights and innovations through which performance will be developed and competitive advantage will be achieved. Although the researchers (Harrison & Sullivan) refer to intellectual assets management strategies in their models, they did not specifically identify innovations and intellectual property.

The proposed intellectual capital management model described in figure 2.7 can develop a holistic perspective. It begins with organization vision, identifies the need for a common strategy and connects strategy to intellectual capital. Management. Within the framework of intellectual capital management, there are areas such as human capital, structural capital, relational capital, intellectual assets and innovation and development capital. These areas require management to provide a holistic view of intellectual capital management that is available to develop common strategy direction that will lead to a vision to generate value for the organization and to improve its performance as well as maximize value rendered to customer and stakeholders.

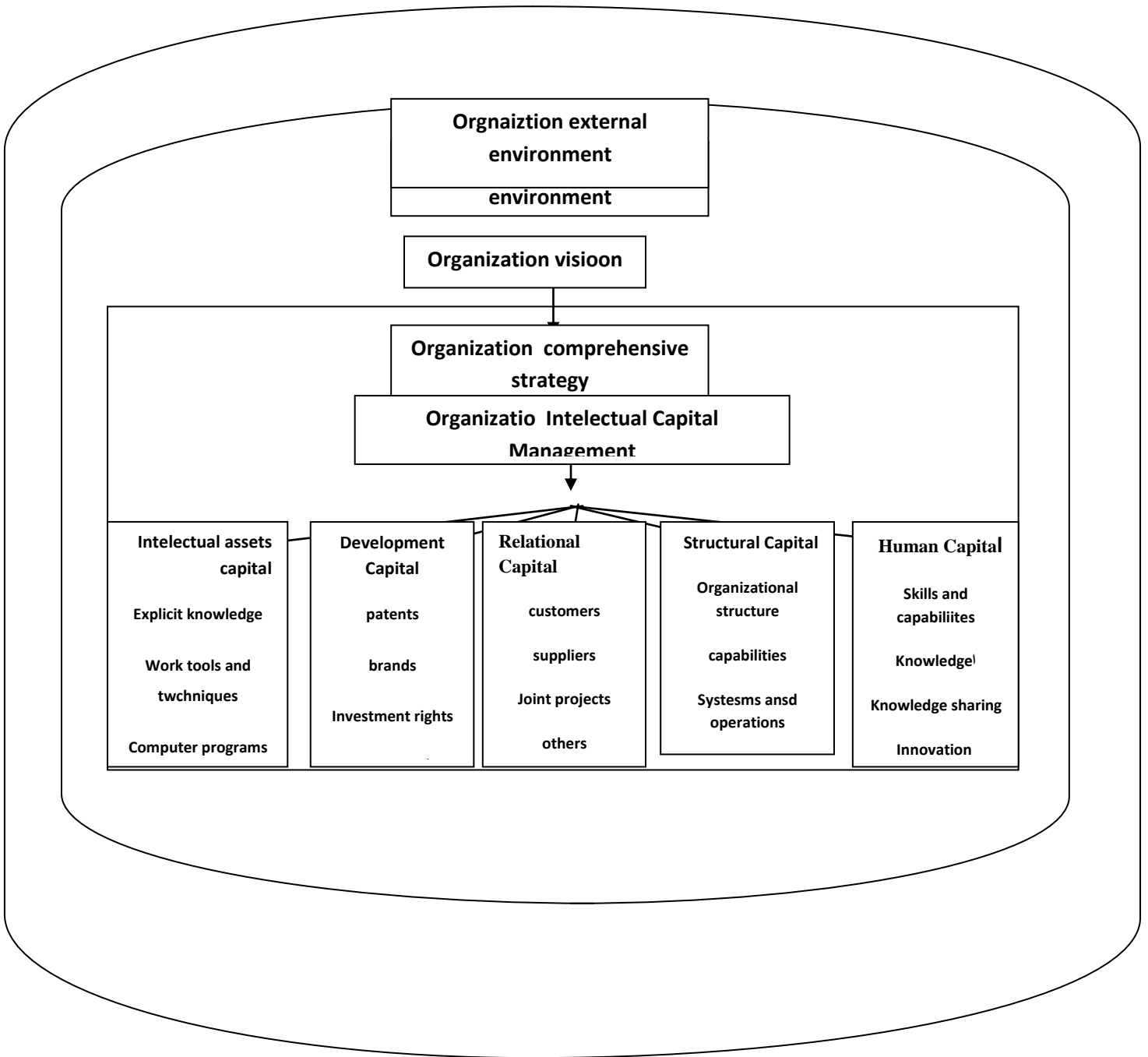


Figure (3-7) Proposed Intellectual Capital management model

Source: Prepared by researcher based on Cake model (Wenger, 2004) and Navigator model APiON (Peppard and Rylander (2001) and new reference model for knowledge management (Firestone & McElroy (2003).

Summery

The strategy provides guidance to organization to achieve its objectives. The difficulties associated with the ability to replicate intellectual capital make it the most important Organization asset. Intellectual capital has a major impact on the development of a strategy for Organization because it reflects Organization's position in a competitive market. Intellectual capital is also specific to value, growth and performance of Organization. The nature of intellectual capital as an intangible asset has led the desire to develop ways to measure it. Although many of methods have been introduced to this practice, but there are still difficulties associated with identification of a measurable method.

Preliminary studies have been conducted to measure intellectual capital. Some issued were discussed such as knowledge contribution, skills and staff experience. The importance of creating and knowledge sharing has been linked to creativity level in the organization. It was emphasized that Organization, through its creativity, could maintain its competitive position and maintain sustainability in a dynamic environment.

نقد

An examination of literature and models developed by various authors has led to development of a model for management of intellectual capital.

The derived model will provide a basis for matching from the cookie model, the APiON vector model taken from the New Zealand organization to manage its intellectual capital, and the new knowledge management reference mode

Hypotheses testing

In order to test study hypotheses multiple regression was used to study the impact of intellectual capital management of (human capital, structural capital, relational capital, intellectual assets capital, innovation and development capital) on each of dependent variables (cost, market share, profitability, performance quality, creativity and development)

HO1: The first hypothesis: There is no significant statistical impact ($p \leq 0.05$) of intellectual capital management by its dimensions (human capital, structural capital, relational capital, capital of intellectual assets, capital of innovation and development.(on Lumenus Technical College (Lemons Education)

Table (1)

Results of IST .hypothesis testing

معامل الانحدار					Sig**	F Calculated	R ²	R	Dep. Variable
Sig**	T Calculated	S. Error	B	Independent Variable					
0.50	-0.69	0.16	-0.11	Constant	0.00	145.13	0.85	0.92	Organization performance development
0.00	4.02	0.08	0.33	Human Capital					
0.03	2.17	0.08	0.18	Structural Capital					
0.00	2.97	0.07	0.19	Relational Capital					
0.00	3.06	0.06	0.18	Intellectual Assets Capital					
0.02	2.42	0.07	0.16	Development and innovation capital					

*The impact is statistical significance at a significant level ($p \leq 0.05$)

The results in table (1) show the impact of intellectual capital on Lumenus University Technical College performance development. The correlation coefficient between intellectual capital and the development of college performance was (92) ($p \leq 0.05$). While R^2 value is (0.85) this means that (84%) of the changes in organization's performance development is due to the change in intellectual capital. The impact value β is (0.33) for human capital, (0.18) for structural capital, (0.19) for relational capital and 0.18 for intellectual assets capital and 0.16 for innovation and development capital. The significance impact is confirmed by F calculated value amounting 145.13, which is significant at ($p \leq 0.05$). In accordance with the decision rule, if F calculated value is greater than F tabulated value of F, then the null hypothesis is rejected and the alternative is accepted therefore the null hypothesis is rejected and the alternative hypothesis is

accepted which states” that there is a significant statistical impact at($p \leq 0.05$) of intellectual capital management with its dimension Human capital, structural capital, venture capital, capital of intellectual assets, capital of innovation and development) on performance development of Lumenus University Technical College (Lumenus Education).

The second hypothesis:

There is no significant statistical impact at ($p \leq 0.05$) level of Luminus College of Technology (Lumenus Education) environment in improving the impact of intellectual capital management of Lumenus College of Education performance development

Table (2)

The Multiple Hierarchy regression Impact of Lumenus College of Technology environment (Lumenus Education) in improving the impact of intellectual capital management on Lumenus College of Technology performance development (Lumenus Education)

Second step			First step			Independent Variables	Dependent Variable
Sig t	Calculated T	β	Sig t	Calculated T	β		
0.00	27.014	0.917	0.00	27.014	0.917	Intellectual Capital	Performance Development
0.01	3.536	0.161				Organization Environment	
		0.854			0.841	R^2	
		0.013			0.840	ΔR^2	
		401.548			729.749	F	
		0.000			0.000	Sig f	

Table (2) shows the results multiple hierarchy regression analysis based on two models. The results of the first model described in the first step reflected a statistically significant impact of

the variable (intellectual capital management) in performance development. F value = 729.749 at level (Sig f = 0.00), which is less than (0.05), and the value of determination coefficient is (R2 = 0.841). This indicates that (intellectual capital management) interpret 84.1% of the variation in performance development,

In the second step, the variable (Organization Environment) was introduced to the regression model, where R2 value was (85.4) This ration is statistically significant since F value = 401.548 at sig f = 0.00, , The value of β is equal to (.917) in organization environment, the T value is = 27.014 and at significant level (sig = 0.00). This confirms significant l impact of organization's environment in influencing the improvement of relationship between intellectual capital management and organization performance development

The ratio of interpretation of variance improved by 13% to increase from 84.1% to 85.4%. This effect is due to organization's environment in improving the impact of intellectual capital management on organization's performance development.

Accordingly, we reject the first null hypothesis which states that there is no statistically significant effect at (0.05) on organization environment in improving the effect of the management of intellectual capital on the development of the organization's performance and accept the alternative hypothesis which states: there is a statistical significant impact at(0.05) level in improving the impact of intellectual capital management on f Lumenus University Technical College performance development (Lumenus Education)

Study Conclusions:

The study concluded the following

-There is a significant statistical positive relationship between intellectual capital elements (human capital, structural capital, relational capital, capital intellectual assets capital and innovation and development capital) collectively in organization internal and external environment with different degrees.

The college has the intellectual capital requirements through having

The five elements of the intellectual capital (Human capital structural capital, relational capital, intellectual assets capital of the and the capital of innovation and development capital,) collectively in Lumenus College Technology performance development

Recommendations

Based on , the researcher recommends the following

- Lumenus University Technical College (Lumenus Education) has to pay attention to intellectual capital and the maintain its assets due to its important role in enhancing the efficiency of Lumenus University's education and through active polarization and performance-related incentive systems.
- Lumenus Technical College should deal with all dimensions of intellectual capital and consider it as an integrated framework with its five dimensions in order to make the most of intellectual capital to improve performance levels,.
- To support activities related to communication channels establishments and support communication policies to maintain bridges between organization and stickholders represented by customers and suppliers

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