

# REVIEW ON INTELLECTUAL CAPITAL AND ITS COMPONENTS TOWARDS COMPETITIVE ADVANTAGE IN UNIVERSITIES

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*Abstract*—Nowadays, business organizations are undergoing in a complex and volatile environment facing big challenges caused from the rapid changes in the economic and political issues. Further, the traditional tangible capitals like cash, buildings, inventories, and etc. As effective weapons for organizational survival can no longer be counted on alone [1]. Since knowledge becomes vital in leading economy currently, the importance of the intangible assets or the so-called intellectual capital has emerged [2]. Until the period of 1990s, the Intellectual Capital management and reporting were widely practiced within industry as a response to the ever increasing investments in intangible assets or intellectual capital such as employees' training, innovation, research and development, customer relationships or software, etc. [3] as well as a solution to the lack of existing accounting methods to provide sufficient information for managing these investments. Hence, it became necessary for organizations to define intellectual capital and learn how to turn it into a profit, or to strategically develop competitive permanent feature. And it becomes imperative for organizations to look at the intellectual wealth, skills and creative ideas inherent in human resources and non-exploitative and innovative so that they can invest in them to extract the highest value through development to achieve a competitive advantage in light of the difficult economic conditions [4]. Towards this end, the paper reviews the related literatures on intellectual capital, its components, its effects on competitive advantage. Figure 1 depicts the conceptual framework of the components of intellectual capital and its effects on competitive advantage. Finally, it narrowed down to focus on managing intellectual capital in universities. It is hoped that the review paper will raise the awareness of knowledge intensive organizations in better utilizing intellectual capital and ultimately achieving competitive advantage.

*Keywords*— *Intellectual Capital; Competitive Advantage; Higher Institutions.*

## 1. INTRODUCTION

Nowadays, business organizations are undergoing in a complex and volatile environment facing big challenges caused from the rapid changes in the economic and political issues. Further, the traditional tangible capitals like cash, buildings, inventories, and etc. as effective weapons for organizational survival can no longer be counted on alone. Since knowledge becomes vital in leading economy currently, the importance of the intangible assets or the so-called intellectual capital has emerged. For a good example to take, the market value of Microsoft Corporation is estimated at US \$ 115 billion, of which the physical capital is only 10% while the remainder up to 90% is represented by the intellectual capital.

Actually, the origin of Intellectual Capital recognized as a wealth creating function can be traced back to 1836 when the Senior, Nassau William wrote that “The intellectual and moral capital of Great Britain far exceeds all the material capital, in importance, but in productiveness”. However, after that the Intellectual Capital was largely ignored in the decision making process in investments. Later, in second half of the 20<sup>th</sup> century economic theories have appreciated, to greater or lesser degree, the existence of intangible elements that explained part of the economic growth [5], [6], [7], [8], [9].

Until the period of 1990s, the Intellectual Capital management and reporting were widely practiced within industry as a response to the ever increasing investments in intangible assets or intellectual capital such as employees’ training, innovation, research and development, customer relationships or software, etc. as well as a solution to the lack of existing accounting methods to provide sufficient information for managing these investments. And up to date, the Intellectual Capital is considered as one of the vital strategic assets for the success and sustainability of the organization in a competitive business environment, and also recognized as the most crucial asset for the survival of knowledge intensive organizations [2].

Hence, it became necessary for organizations to define intellectual capital and learn how to turn it into a profit, or to strategically develop competitive permanent feature. And it becomes imperative for organizations to look at the intellectual wealth, skills and creative ideas inherent in human resources and non-exploitative and innovative so that they can invest in them to extract the highest value through development to achieve a competitive advantage in light of the difficult economic conditions.

Towards this end, the following sections review the related literatures on intellectual capital, its components, and its effects on competitive advantage. Finally, it narrowed down to focus on managing intellectual capital in universities. It is hoped that the review paper will raise the awareness of knowledge intensive organizations to better utilizing intellectual capital and ultimately achieving competitive advantage.

## 2. HISTORY OF INTELLECTUAL CAPITAL RESEARCH

Researches on Intellectual Capital originated in the 1980s and have passed through three distinct stages over the past two decades [4]. In 1986, Karl Erik Sveiby published his first book in Sweden in which he explored how to manage the rapidly growing “Knowledge Companies”, organizations that have no traditional production but only the knowledge and the creativity of their employees..

According to [10] the first stage was until the 1990s during which the researchers focused on developing a framework of intellectual capital and raised academic concerns on the importance of intellectual capital in creating managing sustainable competitive advantage. [11] Developed his theories about the hidden value of intellectual capital of Skandia the Swedish insurance company and developed a management model for this value. Meanwhile, in US, the journalist Thomas Stewart pioneered the field of intellectual capital, which led to his 1997 book titled “*Intellectual Capital: The New Wealth of Organizations*”. As commented by [10] the aim of stage one was to render the invisible visible by creating a discourse that all could engage in and mission accomplished.

The first decade of the 21<sup>st</sup> Century witnessed the second stage of the research. During the period, researchers devoted on approaches to measure, manage and report the intellectual capital to convince its significance for future development [10]. Various intellectual capital valuations were proposal, to name but a few, [12]; [13]; [14]; [15], [16]; [17], and etc.

From the 2010 and onwards, the third stage of intellectual capital research has been emerging and is characterized by critically examining intellectual capital in practice and the managerial implications of how to use intellectual capital in managing a company [4]. The researches consider value is not only monetary but also needs to be combined with worth and importance of the products and services to customers and other stakeholders [18].

### **3. DEFINITION OF INTELLECTUAL CAPITAL**

The concept of intellectual capital was proposed when [19] proposed the term “human assets accounting” to measure the value of an organization’s employees and to be incorporated into the financial statements with other different categories. Later, [20] named a new term “human resources accounting” for providing management information. Actually, most Intellectual Capital literature has stemmed from the accounting and financial perspective but extended into other fields under different terms. In the accounting literature the term “intangible assets” is used as a synonym although it does not appear on the company’s balance sheet. While for economists, intellectual capital is termed as knowledge assets. And the intellectual capital is more often used in the management and legal literature. In the end, the terms “intangible assets”, “knowledge assets or capital”, and “intellectual assets or capital” are interchangeable used. In this study, researchers opt to the term intellectual capital.

Since the interest of it begun in 1980s, various definitions of Intellectual Capital have been proposed. [21] Defined Intellectual Capital is the term given to combine intangible assets which enable the company to function. According to [22] Intellectual Capital is the sum of knowledge of company’s members and practical translation of this knowledge like trademark, patents and brands. [11] Defined Intellectual Capital as a source of intangible assets that often don’t appear on the balance sheet. Based on [23] Intellectual Capital is a package of useful knowledge that includes an organizations processes technologies, patents, employees, skills and information about customers, supplier and stakeholder. Further, [24] refers Intellectual Capital as the knowledge, experience, brainpower of employee as well as knowledge resource, stored in an organizations databases system processes, culture and philosophy. [25], [26] mentioned the concept of Intellectual Capital is that the difference between book value and market value. [13] Defined Intellectual Capital as the collection of intangible resources and their flows.

Although it is argued that there is no generally accepted definition of Intellectual Capital [1], [27] it is commonly agreed that Intellectual Capital has different intangible resources such as education, knowledge, employees competences, skills, intellectual agility, customer relationship, brand names and organizational structure [28]; [22]; [29]; [30]; [26]; and [31] .

### **4. COMPOSITION MODEL OF INTELLECTUAL CAPITAL**

With a wide range of intangible resources, Intellectual Capital is widely classified into three basic and strongly interrelated components human, structure, and customer capital [31]; [26]; [32]; [33]. [34] Classified components of intellectual capital as market assets, assets cantered on humans, intellectual property, and infrastructure assets as shown in Fig. 1. Market assets include customers’ loyalty, brands, distribution channel, contracts and advertising that give potential to competitive advantage. Assets cantered on humans are the employees’ experience, creativity, solving problem ability and leadership. Intellectual property is know-how, trade secrets, trademarks, patents and design rights. Infrastructure assets are the technology, methodologies, organization culture, and communication system and so on.

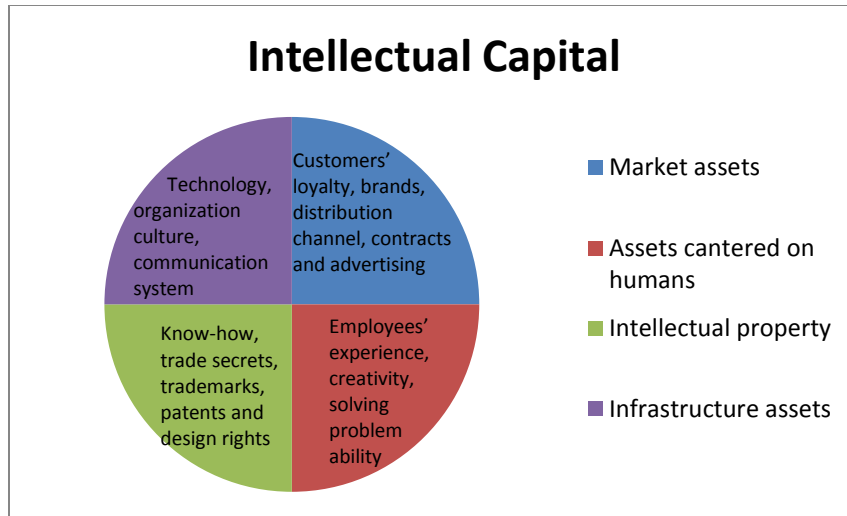


Figure 1: Intellectual Capital Model by [33]

[28] Emphasized another classification of three components, namely, employees' competences, internal structure, and external structure, as shown in Fig. 2. Employees' competences are the experience and education to create tangible and intangible assets. Internal structure represents the IT system, concept, models, and patents. External structure is the relations between organization and the suppliers and customers.

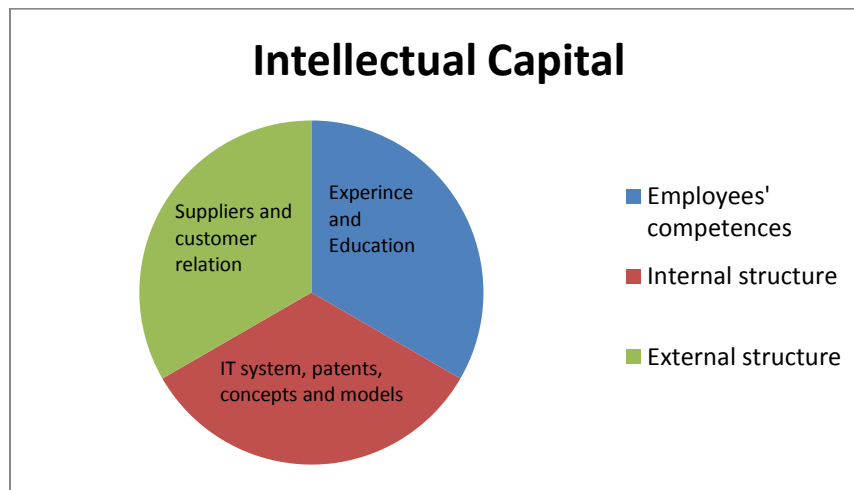


Figure 2: Intellectual Capital Model by [28]

[11] Identified intellectual capital in two components, "human capital" and "structure capital" as shown in figure 3. Human capital is employees' knowledge, skill and innovation that are deal with organization vale and culture. Structure capital is all the hardware, software, database, and organization structure that to improve the productivity of the organization.

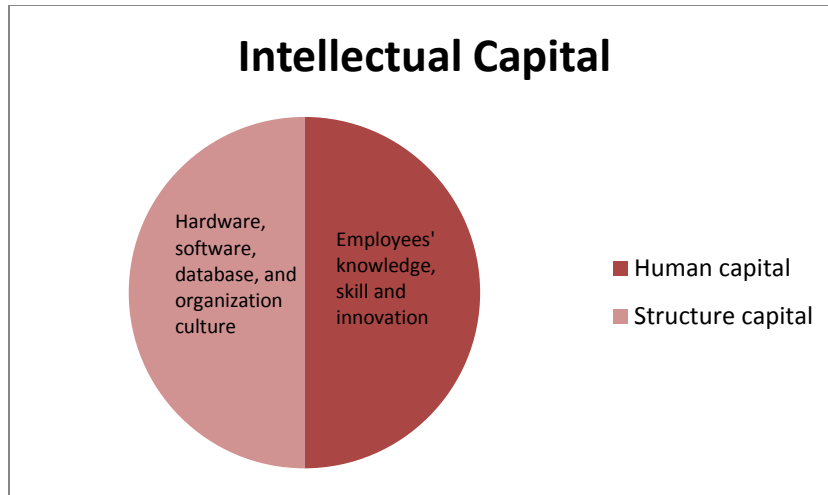


Figure 3: Intellectual Capital Model by [11]

According to [23] Intellectual Capital consists of human capital, structure capital and customer capital as shown in Fig. 4. Human capital is the head of innovation but it is not owned by the organization. Structure capital is own by organization representing its system, data, strategies, publications, culture and procedures. Customer capital is the relation between the customer and organization.

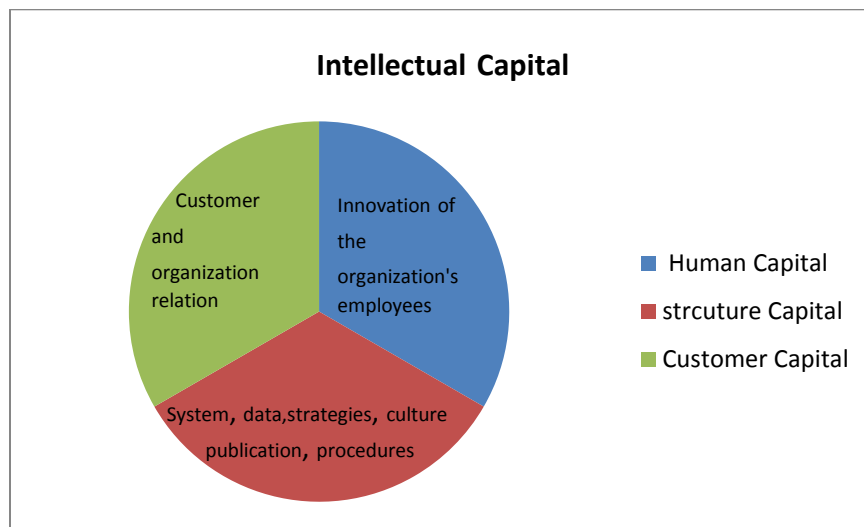


Figure 4: Intellectual Capital Model by [23]

The three Intellectual Capital components classification was later extended. [34] Replaced customer capital by relation capital. [35] Further categorized intellectual capital into six components namely Human, Structure, Customer, Social, Technological, and Spiritual Capital. The following section elaborates the details of the six components.

In addition, Institutes of higher education used the same components for reporting their Intellectual Capital taking the previous guidelines for companies [36]; [17]; [37]; [38]; [39]; [40]; [41].

## 5. COMPONENTS OF INTELLECTUAL CAPITAL

### 5.1 Human Capital

In today an exigency need for high class human capital [42]. According to [43] human capital is the knowledge that individual obtained, and it is increasing his value contribution to the organization and his own performance. Human capital is the intangible asset at an organization in terms of innovation [31]; [23]; [33]. Later, researchers further found that the human capital is the main source of creativity and innovation [44]; [45]; [46]; and [47]. It depends on knowledge, skills, competencies, capabilities, and innovation of employees [48]; [49]; [50]; [26]; [29]; and [11]. In university case, the human capital could be defined as the set of explicit and tacit knowledge of the university individual such as professors, researchers, and assistant through formal and informal education and actualization processes embodied in their activities [41]. In other word, human capital was defined by [51], as knowledge that the human resources (teachers, researchers, PhD students, and administrative staff) would take with them if they leave the university. In addition, human resources have a potential to convert to the human capital by proper management [52].

### 5.2 Relation Capital

According to [53], Relation capital encompasses the external revenue generating aspect of the organization. Relation capital has the most challenge from other intellectual capital components to codify due to its external characteristics [54]. Relation capital is based on the relationships between organization and its customers [11]. It is the knowledge in relation with customers, suppliers, industry associations and stakeholders that has impact the organization. The other important relationships within relation capital are employees, management, shareholders, public, institutions and associations [55]. [22] illustrate that it is significant for the organization to have strong relation with its customer to gain competitive advantage. Relation capital is an important dimension that affects inward relationships of an organization and the customer [56]. This is the worth reflected in customers confidence of the organization's service or product [57]. Moreover, [41] stated that the relation capital gathers the wide set of economic, political and institutional relationships between the university and its non-academic: enterprises, non-profit organizations, local government and society in general.

### 5.3 Structure Capital

[22] Defined structure capital as what remains in the company when employees go home at night. [53] Described structure capital as all the non-human storehouse of knowledge in organizations, which include the databases, organizational charts, process manual, strategies, routines and anything whose value to the company is higher than its material value. The structure capital depends on the innovation and process capital. Innovation capital means how an organization creates new products and services and the process capital refers to the system, tools and techniques of the organization [11]. The investment of an organization in technology, and its internal process will improve the structure capital; structure capital gives the organization potential to gain in long term competitive advantage by creating value added to its products or services [58] and [59]. According to [41], structure capital is the explicit knowledge related to the internal process of dissemination, communication, management scientific and technical knowledge in the organization.

### 5.4 Social Capital

Social capital is one the most important component of intellectual capital and it has significant contribution towards the firms' performances [60], [61] and sustainable competitive advantage [62]; [63]; [64]. Social capital is the combination of relationships inside the firm and with external entities and helps organizations by absorbing knowledge to control and to gain access to resources [64]. [65] Defined social capital as a sum of resources accumulated in the organization by a stable network of intra organizational relationships. According to [64], social capital is a sum of current and potential resources incorporated in, available in, and derived from the network of relations possessed by an individual or social unity. [66] Stated that social capital is the glue that holds societies together. [67] Emphasized that social capital represents the value of human connections based on confidence and on personal networks. They stressed that without social capital innovation, sharing of knowledge and productivity can be dramatically reduced in organizations [68]. [64] Introduced three dimensions of social capital which is widely accepted such as structural, cognitive and relational. These dimensions of social capital create the value of the intellectual capital of an organization. [61] Stressed that it must be noted that it should not be erroneously identified social capital with business capital or customer capital that derived from the relationships with agents such as customers, suppliers and competitors. Social Capital includes the set of relationship with the remaining social

agents. Social capital is playing highly significant role in the development of intellectual capital in an organization [67], [61].

### *5.5 Technological Capital*

Technological capital is the set of intangible assets which is based on innovation that is related to technology staff and technical process. Knowledge related to use of innovation of production techniques, access and product technology is the main base of technological capital [43]. [69] Agreed that technological capital is an intangible asset and it derives from technical knowledge. In the same way, [70] stated that technological capital is a part of intellectual capital and is a combination of knowledge related to the development and technical system of an organization. It is based on the activities and functions related to the development of products and services of the organization. Technological capabilities of organizations, particularly knowledge intensive organizations, are seemed as one of the basic foundations of their competitiveness [71]; [72]; [3]. [61] stated that technological capital is based on the research & development and information technological knowledge. [73] Argued that the higher the technological knowledge of an organization, the greater the protection of intellectual capital against imitation. Therefore, on the basis of above mentioned literature, it can be concluded that technological capital is one the most important component of intellectual capital, and it is based on information technology (IT), knowledge research development (R&D) and protection rights.

### *5.6 Spiritual Capital*

According to [74] Spiritual capital can be defined as the intangible knowledge, faith and emotions embedded in the minds of individuals and in the hearts of organization which includes vision, direction, guidance, principles, values and culture. [74] Introduced spiritual capital as an additional component of intellectual capital as which plays an important role to enhance the organizational performance of Telecom sector in Malaysia. Spiritual capital is a combination of power, influence, spirit and knowledge that can gained through religion [75]. [76] stated that due to spiritual capital a leader can deploy spiritual resources in social context and they follow God's will by following divine laws or values in their daily lives. Spiritual capital has consistence and definite purpose for people such as looking for meanings of life [77]. Spiritual capital consists of happiness, forgiveness, kindness, faith, integrity, empathy and honesty [78] and [79]. Consequently, on the basis of literature reviewed it can be concluded that spiritual capital is also an important component of intellectual capital, and it is playing significant contribution to the performance of organizations. It is mainly based on two dimensions such as religious and ethical values. Spiritual capital is the power and influence that are created by a person or organization with the help of spiritual knowledge and religious beliefs [80]. It has been highlighted, however, that the sustaining of competitive advantage for a longer time entails support provided by spiritual capital [81].

To sum up, human capital generates IC through their competence, their attitude and their intellectual agility. Relation capital covers the important relationships with not only customers, but also employees, management, shareholders, public, institutions and associations. Structure capital gives the organization potential to gain in long term competitive advantage by creating value added to its products or services. Social capital helps organizations by absorbing knowledge to control and to gain access to resources. Technological capital is a part of intellectual capital and is a combination of knowledge related to the development and technical system of an organization Spiritual capital is a combination of power, influence, spirit and knowledge that can gained through religion.

## **6. IMPORTANTLY OF INTELLECTUAL CAPITAL IN ORGANIZATION**

The knowledge of the intellectual capital of the organization position within the different resources it can determine the appropriate method of assessment has continuously improving the performance of current and future of the organization, and the evaluation of Intellectual capital performance allows for create the competitiveness of the organization.

Towards this end, the success of organizations largely depends on the creating, discovering, capturing, disseminating and utilizing such knowledge resources or the called Intellectual capital. According to [1] investing in

knowledge is essential to their ability to create high value products and services which leads to gaining sustainable competitive advantages in organizations.

## **7. MANAGING INTELLECTUAL CAPITAL IN UNIVERSITIES**

In the early time, the experiences and the academic literature referring to Intellectual Capital concentrated on corporations. Since the late 1990s, the interest has extended from the private organizations to the public ones, particularly to universities and research centers. Further, the Intellectual Capital has been becoming a popular subject at universities and institutions of research, especially in the European higher education. And Intellectual Capital reporting instrument have been adapted by public research organizations and universities

The first country that has adopted Intellectual Capital report widely for research organizations and universities are Austria. Not surprisingly, the Austrian Institute of Technology in 1999 was the first European research organization to publish an Intellectual Capital report for the entire organization. And the report of Intellectual Capital in this research organization is to support information for management of intangible investments and to disclose information for the stakeholders [82]. In Poland, Poznan University of Economics was the first university to launch Intellectual Capital project. [83] Presented an Intellectual Capital report in the way of resources, activities, and results following the method that was proposed by the Danish Ministry of Science, Technology and Innovation.

Moreover, Spain is another country in Europe that takes advantage of the Intellectual Capital managing and reporting at the universities based on voluntary approaches. The Observatory of European Universities (OEU) proposed the presentation of an Intellectual Capital report called the Intellectual Capital Universities (ICU) Report, specifically designed for universities and research centers, with the aim of improving transparency and aiding the homogenous dissemination of the indicators of intellectual capital [51].

In summary, the reporting of the Intellectual Capital in some universities and research centers have started for developing and describing their intellectual capital and knowledge flows [84] and [85]. And it is absolutely necessary for universities to disclose information of the intangibles from the filing of an intellectual capital report that will be a good exercise of transparency from these institutions to provide users access to a type of relevant information for decision making [61].

The intellectual capital becomes critical at universities, because of the fact that “knowledge” is the main output as well as input in these institutions [39]. A model for reporting and managing Intellectual Capital resources in universities and research organisations was suggested [37]. Intellectual Capital principles can be broadly applied to Universities and that reporting on their Intellectual Capital would be beneficial for them and the society as whole [17].

Organizations do not differ much from each other in terms of possession of material and human resources, especially education organizations, but differ in terms of owning a sustainable competitive advantages of intellectual capital, and from here we can identify the problem of current research in that many of the institutions of education may be overlooked the importance of knowledge generation and management, and made for well as important and influential supplier in achieving enterprise efficiency and competitive advantage.

To conclude, the intellectual capital concept was first developed as a framework to analyze the contribution of intellectual resources in profit organizations, it was soon taken over by public and nonprofit organizations because of its importance [86]. Nowadays, more interests have been attached in managing intellectual capital in universities, as its main goals are not only the production and dissemination of knowledge and more importantly its investments in research and human resources (Sánchez et al., 2009; [88]; [3]. Hence, it becomes imperative for higher education institutions, being an ideal framework for the application of intellectual capital, to march in the right way of managing intellectual capital towards obtaining competitive advantage.



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