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Intellectual Capital: Genealogy and Models

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Abstract

Undoubtedly, 21st century is the time of accelerating changes and broad threats in national and international. To guarantee and keep on their life, organizations and communities need to distinguish them from others, to achieve a competitive advantage and, ultimately, to stabilize that advantage. The key tool to achieve a sustainable competitive advantage is knowledge. Stresses by organizations, entities and public institutes on knowledge as an intangible asset indicate the importance of such phenomenon. Intellectual capital is an intangible asset that its value is not mitigated by higher uses. Organizations attempt to acquire profit by relying upon such critical and strategic instrument. The aim of present paper is genealogy of intellectual capital and studying different aspects of such important phenomenon and reviewing models/approaches assigned to it.

Keywords

Intellectual Capital, Relational Capital, Human Capital, Structural Capital

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1. Introduction

By the occurrence of IT and transition from industrial society to information/network society as well as rapid technological advancements, economic progress model is radically changes in countries. In today global economy, financial/physical capitals are replaced by knowledge as an intangible asset and as the most important capital (Bontis, 1996). Attention to this intangible asset is remarkably increased so that Kendrick in 1929 said that intangible to tangible asset ratio is 30 to 70 while in 1990, it arrived at 63 to 37. Likewise, Leo believes that intangible asset constitutes 85% of total organizational market share (Seetharaman et al., 2002).

Knowledge based business environment needs an approach which involves new intangible assets like HR knowledge and competencies, innovation, organizational culture, organizational structure, etc. However, intellectual capital theory is increasingly paid attention by academic researchers and organizational connoisseurs (Bontis, 1999).

2. Reviewing the Literature

2.1. Types of Resources

By entering knowledge economy, we need new models of organizational assets. Overall, organizational assets and resources are divided into two groups: tangible and intangible resources.

Tangible resources: they include financial and physical assets (Grant, 2010). These assets include physical properties, machineries, equipment and technologies and they are mainly visible and imitable (Setayesh & Kazemnejad, 2009).

Intangible resources: they are divided into two parts: assets protected by law such as copyright, marks and brands (Grant, 2010). However, some intangible assets cannot be considered

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as strategic assets (Riahi-Belkaoui, 2003). Other invisible assets include intellectual capital that their higher consumption would not mitigate their values and they are not reflected in balance sheets (Tayles et al., 2002). Intellectual capital is seen as a vital strategic asset. It impacts on organizational performance, thinking way and employees' behavior/morality.

Barney introduces four determinants in creating a competitive advantage as below:

1. Value generation for customers
2. Resource scarcity
3. Imitability
4. Succession capability

Intangible resources are the only ones that enjoy such traits (Kristandl & Bontis, 2007). They are called with different names such as intangible assets, invisible assets, knowledge assets, knowledge capital, information assets, human capital and hidden value (Chan, 2009).

Intellectual capital is raised as a new issue in recent years theoretically. Since it is seen as a valuable source for countries and organizations, its growth is rapidly changing to an indicator of development of the countries. On the other hand, this intangible resource is considered as one the highest value generating resources of organizations and a key capital in entrepreneurship growth. Hence, the necessity of intellectual capital development and management is changed to a serious necessity in national level and in business arena and it would lead into changes in industrial economy dominated paradigm by moving toward basic knowledge economy (Motalebi, 2001).

Knowledge – based communities are shaping and revolving and their harmonies are undeniable. Peter Drucker predicted that future organizations are knowledge based more than before and they will compete against each other based on knowledge resources and networks they create. In fact, knowledge is the main economic source and is considered as a component of intangible assets (Sullivan, 2000).

Hence, transformation toward knowledge – based economy would have widespread impacts. Therefore, market value of any company is related to intellectual capital. As entrepreneurs and CEOs pay attention to physical assets, they also should respect the management of intangible assets and intellectual capital as a necessity (Kong, 2007).

2.2. Intellectual Capital Genealogy

One can say that studies by Machlop on knowledge in early 1960s are, inter alia, the first theoretical respects to intellectual capital concepts (Kong, 2007). Intellectual capital is the offspring of knowledge and science. Both terms are passing their revolving period. This concept was initially coined in 1991 when Swedish Scandia Company started a set of scientific innovative methods for paying attention to its own intangible assets. If we consider the growth of hardware power as an important index, then we should say that when we celebrated the 20th year of intellectual capital concept in 2011, the computers will achieve a capacity identical to human brain (Motalebi, 2001).

Table 1. Intellectual capital definitions.

No.	Author	Year	Definition
1	Bontis	1996	Intellectual capital is the capturing, coding and disseminating information to acquire new competencies through training and development to reengineering of commercial processes.
2	Brooking	1996	Intellectual capital is a term referred to a set of market intangible assets, intellectual property, human – oriented assets and infrastructural assets which enable the company to do its functions.
3	Edvinsson & Malone	1997	Intellectual capital means to have knowledge, applied experience, organizational technology, customer relations and professional skills in a competitive advantage market.
4	Bontis	1998	Intellectual capital, seeking and pursuing effective usage of knowledge (manufactured product) compared to information (raw material).
5	Stewart	1998	Intellectual capital is an intellectual material – knowledge, information, intellectual property and experience – which can be used to generate wealth. Intellectual capital is a collective intellectual power or fruitful knowledge.
6	Brennan	2001	Intellectual capital is an invisible asset like copyright, intellectual property right and franchise.
7	Cho & Bontis	2002	Intellectual capital consists of different capitals rooted in employees, routine organizational affairs, intellectual property and relations to customers, suppliers, distributors and partners.
8	Reinhardt	2005	Intellectual capital is the knowledge of organizational members and its practical conversion into organizational practice.
9	Mavridis	2005	Intellectual capital is an invisible asset with its potentiality in generating value for the company and society.
10	Marr	2008	Nonfinancial fixed assets which lack observable and physical nature but are maintained by the economic firm and are identifiable and controllable via legal rights.
11	Vasile	2008	Intellectual capital is used knowledge and information to generate value.

Bontis believes that intellectual capital is an attempt to use knowledge (end product) effectively against information (raw material). Intellectual capital is a term to mix market intangible asset, intellectual asset, human asset and infrastructural asset which make the organization capable to perform its operations. Stewart believes that intellectual capital includes knowledge, information, intellectual asset and experience that can be used for wealth generation. Intellectual capital is collective mental capability or key knowledge (Ghelichli, & Moshabaki, 2006).

In another definition, intellectual capital includes intellectual components (knowledge, information, intellectual asset and experience) which generate wealth (Holmen, 2005). Table 1 depicts some definitions on intellectual capital.

2.3. Intellectual Capital Components

Intellectual capital connoisseurs concur that it consists of three components: human capital, structural capital and relational capital. Here, these components are further explained:

2.3.1. Human Capital

Roos et al (1997) say that employees create intellectual capital through their competency, vision and intellectual nimbleness (Ghelichli & Moshabaki, 2006). The most important components of organizational human capital are manpower's skills as well as the depth and broadness of their experience. Human resources can act as the spirit and thinking of intellectual capital resources. At the end of a business day, this capital is left through leaving the company by employees while structural and relational capitals remain unchanged even when people leave the organization. Human capital includes: manpower skills and competencies, its knowledge on fields that are important and necessary for organizational success and employees' talents, ethics and behavior (Kong, 2007).

2.3.2. Structural Capital

Roos et al (1997) believe that structural capital includes all nonhuman reservoirs of the knowledge in an organization which involve databases, organizational charts, executive mandates of processes and, overall, everything that its value for organization is higher than knowledge material values (Kong, 2007). It refers to current processes and structures inside an organization that employees use them and by which they utilize their knowledge and skills (Vergauwen, 2007).

According to Bontis, if an organization has weak working regimes and procedures, intellectual capital will not be able to achieve its maximum potential capability while organizations with strong structural capital are equipped with a supportive culture which enables people to do new things. Likewise, Chen et al believe that structural capital can help employees to achieve an optimized intellectual performance and to improve organizational business performance (Ghelichli & Moshabaki, 2006). Structural capital covers a broad domain of necessary factors including:

1. Important organizational administrative processes and how to structure them
2. Policies, information flows and the elements of databases
3. Leadership and management styles
4. Organizational culture
5. Employees' incentive schemes (Motalebi, 2001).

2.3.3. Relational Capital

Stewart states that the main issue in customer capital is existing knowledge in marketing channels and customer relations. Customer capital shows the potential capability of an organization due to external invisible factors. Nornel found that customer satisfaction can keep business relationship, mitigate product price flexibility and increase the reputation of the company (Chen & Xie, 2004). Principally, relational capital includes all relations between an organization with another person or organization. Such people and organizations can include all relations, employees, investors and so on.

Customer capital is considered as a bridge and organizer of intellectual capital operation and as a determinant in changing intellectual capital to market value (Beigi, 2002). Relational capital includes:

1. Identifying and defining organizational intellectual capital
2. Planning key value stimulants
3. Measuring intellectual capital
4. Intellectual capital reporting
5. Intellectual capital management and running (Motalebi, 2001).

Vasile believes that knowledge is an economic value which is enhancing increasingly and it is more observable in companies that have lower visible values (Rose & Barrons, 2005).

2.4. Intellectual Capital Models

2.4.1. Bontis' Model (1998 & 2000)

Bontis defined three types of human, structural and customer capitals and then (in 2000) these aspects changes to human, structural and relational capitals and intellectual property. Figure 1 depicts the concept of intellectual capital in terms of Bontis.

2.4.2. Roos et al Model (1997)

Roos et al divided intellectual capital into human capital and structural capital. They considered relational capital as a part of structural capital (Chang, 2007). Table 2 depicts constituents and sub-constituents of this model along with some examples.

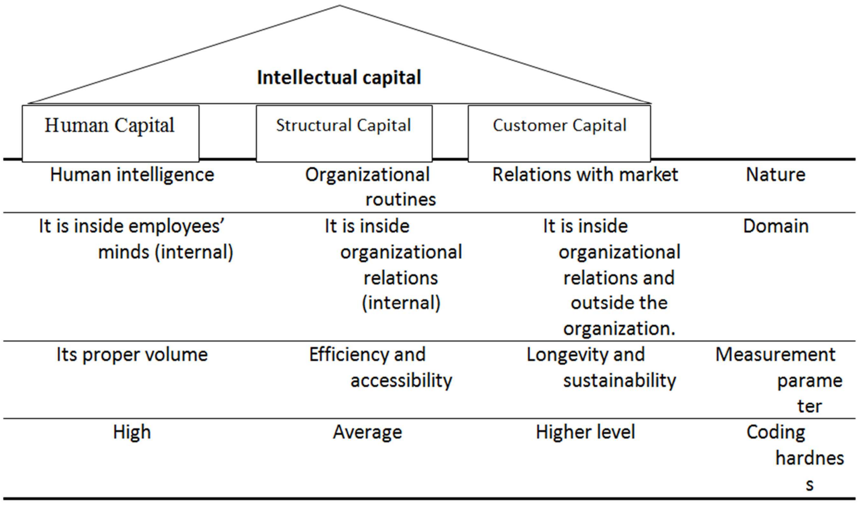

Figure 1. Bontis' model (1998 & 2000).

Table 2. Constituents and sub-constituents in Ross et al model.

Example	Constituents	Capital
Employees' personal knowledge, talents and ingeniousness	Competency	
Generated value from employees' behavior	Thinking way	Human
Personal creativity	Intellectual nimbleness	
Relations to customers, suppliers and partners	Relations	
Pointing to process and culture	Organization	Structural
What generates value in future	Recovery and improvement	

2.4.3. Chen et al Model (2004)

They believe that intellectual capital consists of four components: human capital, customer capital, innovation capital and structural capital. Figure 2 depicts this model.

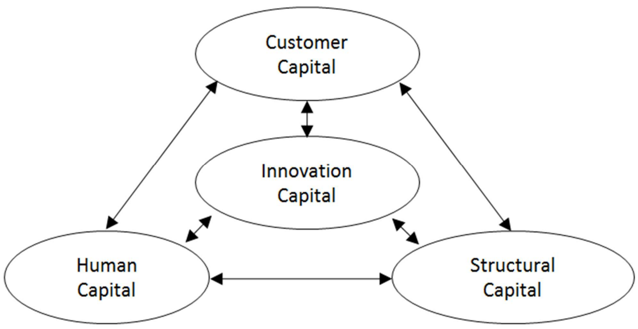

Figure 2. intellectual capital model (Chen et al., 2004).

2.4.4. Marr and Schiuma Model (2001)

They defined intellectual capital as a group of knowledge assets assigned to an organization and promote organizational competitive situation remarkably by adding to the value of beneficiaries. They divided intellectual capital into six categories as shown in table 3.

Table 3. The elements of Mer and Schooma model (2001) along with categories and definitions.

Definition	Category	
All relations between a company and its stakeholders	Relation to beneficiaries	beneficierie 's resources
It renders by employees in the format of skills, competencies, commitment, motivation and loyalty or guidance and advice.	HR	
ITC like databases, servers and networks	Physical infrastructures	
Organizational values and norms	Culture	
Internal official/unofficial operation like process guidance, coded procedures and laws, virtual networks and implicit laws and regulations on unofficial procedures as well as implicit laws on behavior and style of management	Organizational operations and routines	Virtual infrastructure
Copyrights, trademarks, brands, plans, patents	Intellectual property	

3. Discussion and Conclusion

Intellectual capital is an asset which measures the capability of an economic firm to generate wealth. Intellectual capital is an intangible asset never registered in financial balance sheets and its market value is never recognized but the organizations own it and can guarantee their survival by utilizing it correctly and achieving sustainable competitive advantage.

Today, it is observed that knowledge – oriented communities are shaping and revolving and their hegemony is undeniable and certain. One may say that Drucker's prediction is getting close to reality. He predicted that future organizations will be knowledge – based more than before and they will compete against each other based on the knowledge resources and networks they create. Hence, transformation toward knowledge – based economy would have widespread impacts. To the same reason, the market value of the company is depended to intellectual capital more than before and as entrepreneurs and CEOs pay attention to physical assets, they should also respect invisible assets and intellectual capital as a necessity.

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