

# The MICO Model of Intellectual Capital

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To date intellectual capital definitions have not dealt systematically with intellectual capital challenges. The paper takes a step further in the evolution of intellectual capital and defines intellectual capital according to its challenges. Market-to-book value, increasing returns and competitive advantage enable an asset to be defined as intellectual capital. Further, the ownership transformation of volatile intellectual capital is essential to the definition of owned intellectual capital. The paper divides intellectual capital challenges into two categories: (a) basic challenges that refer to the definition of intellectual capital and (b) ownership transformation challenge. Such an approach enables us to present the MICO model of intellectual capital.

**Keywords:** Intellectual capital; Competitive advantage; Increasing returns; Market value; Ownership transformation.

## MICO model intelektualnega kapitala

Opredelitve intelektualnega kapitala v preteklosti niso sistematično posegale na področje izzivov intelektualnega kapitala. Članek skuša opredeliti intelektualni kapital v povezanosti z njegovimi izzivi. Razmerje med tržno in knjigovodsko vrednostjo, naraščajoči donosi in konkurenčna prednost omogočajo, da se neko sredstvo opredeli kot intelektualni kapital. Nadalje pa preoblikovanje lastništva nestanovitnega intelektualnega kapitala omogoča opredeliti lastniški intelektualni kapital. V ta namen so izzivi intelektualnega kapitala razčlenjeni v dve skupini: (a) osnovne izzive, ki se nanašajo na opredelitev intelektualnega kapitala in (b) izziv preoblikovanja lastništva. Ta pristop nam omogoča predstaviti MICO model intelektualnega kapitala.

**Ključne besede:** Intelektualni kapital, konkurenčna prednost; naraščajoči donosi, tržna vrednost, preoblikovanje lastništva

## 1 Introduction

Although Brooking says that intellectual capital has been around since the first vendor established a good relationship with a customer (Brooking, 1998: 12), rapid changes, communications, globalization and new technology set intellectual capital as the main value driver. Intellectual capital forms a greater part of the value that customers are willing to pay than in the past. Therefore, intellectual capital is becoming the main resource and the main tool to achieve competitiveness. Lev (2001: 9) states that intensified business competition, brought about by the globalization of trade and deregulation in key economic sectors (such as telecommunications, financial services, transportation), and the advent of information technologies with internet have dramatically changed the structure of corporations and have catapulted intangibles into the role of the major value driver of businesses in developed economies. Intellectual capital is the most valuable resource, so firms have to concentrate on its development and management. Thus, intellectual capital radically changes the ways of creating value.

Although a lot has been written about intellectual capital in the last decade, a generally accepted model for defining it has not been set. The purpose of this paper is to discuss the challenges or conditions of intellectual capital and propose a model for its definition.

## 2 Literature review

Intellectual capital is the possession of the knowledge, applied experience, organizational technology, customer relationships and professional skills that provide a company with a competitive edge in the market (Edvinsson and Malone, 1997: 44). Further, Brooking (1998: 12) argues that intellectual capital are combined intangible assets which enable the company to function. Similarly, Stewart (1999: xx) defines intellectual capital as intellectual material (knowledge, information, intellectual property, experience) that can create wealth. We can say that intellectual capital, also called intangible assets or intangible resources, are assets found in all kinds of knowledge: tacit (that is knowledge in the heads of people) and explicit (knowledge formally expressed). However, intellectual capital is not just the stock of knowledge; it is composed by flows among different components of intellectual capital stock, as well. As Fritz Machlup put it, "At any moment of time, there is a stock of knowledge; during any period of time, there is a flow of knowledge" (Stewart, 1999: 111). Intellectual capital is quite simply the collection of intangible resources and their flows (Bontis, 1999). The flows among different kinds of knowledge permit the development of intellectual capital. We can see that there is a need for clarification of what exactly intellectual capital means or represents for a firm and what the effects of intellectual capital are.

Andriessen (2001: 212-213) drew up a list of criteria on which the strength of intellectual capital depends: it should add value to the customer, it should give you a competitive edge, it should offer potential for the future, it should be sustainable for several years and it should be firmly anchored in the organization. Specifically, the importance of intellectual capital is emphasised in Guthrie (2001: 28): the revolution in information technology and the information society; the rising importance of knowledge and the knowledge-based economy; the changes in patterns of interpersonal activities and the network society; and the emergence of innovation and creativity as the principal determinant of competitiveness.

Intellectual capital is divided into human, structural and relationship capital (Roos et al., 2000; Edvinsson and Malone, 1997; Saint-Onge, 1996; Sveiby, 1997; Bontis, 1998; Stewart, 1999). Human capital is composed of human knowledge, attitude to work and intellectual agility (Roos et al., 2000). Structural capital is often said to be the part of intellectual capital that is left at the office when employees go home. The important parts of structural capital are culture, processes, management and information technology, which represent the infrastructure for human and relationship capital; meanwhile relationship capital lies in the relationships with customers, partners and other stakeholders, the endurance and the strength of these relationships (Nemec Rudež, 2004).

### 3 Intellectual capital challenges

#### 3.1 Basic challenges of intellectual capital

Knowledge is the most important strategic resource and the ability to acquire and develop, share and apply it can lead to sustainable competitive advantage (Grant, 1996). Intellectual capital is based on knowledge and provides the opportunity to reach sustainable competitive advantage (Nemec, 2002). Prusak (Marti, 2001: 150) says that "researchers in the areas of sustainable competitive advantage have come to the conclusion that the only thing that gives an organization a competitive edge, the only thing that is sustainable, is what it knows, how it uses what it knows, and how fast it can know something new". In a rapidly changing competitive environment, intellectual capital is becoming the most important tool for attaining competitive advantage (Klein, 1997: 1; Sullivan, 2000, 14; Edvinsson, 2001: 21). Competitive advantage depends on the speed at which intellectual capital is generated, captured, used, and disseminated.

The base of competitive advantage has moved from tangible to intellectual capital. Present and future success in increasingly competitive and volatile marketplaces will be based less on the strategic allocation and management of physical and financial assets and more on the strategic management and leverage of intellectual capital (Galbreath, 2002: 125). Competitive advantage as the challenge of intellectual capital opens a question about the relationship between competition and intellectual capital. This can be put into two questions:

- Is increasing competition the result of increased intellectual capital?
- On the other hand, is the increasing importance of intellectual capital in fact the answer to increased competition?

Increased rivalry among firms has arisen from generating, capturing, disseminating and using all forms of knowledge in leading firms. Consequently, others have to adapt to the current situation by creating and managing intellectual capital. This is the most important requirement in the new economy in which firms are faced with increased competition since the only asset that can bring competitive advantage in today's turbulent economy is intellectual capital.

There is double-arrow causation. Intellectual capital increases competition and the result of increased competition is the necessity to develop and manage intellectual capital in order to prevent financial loss and failure. Firms have to adapt themselves to the competition that arises from the rising usage of knowledge. The answer to the increased competition is intellectual capital development. Therefore, the cycle is closing (see Figure 1).

Intellectual capital is characterized by increasing returns to scale, too. Unlike iron, oil or land, intellectual capital is not intrinsically scarce; it can be conjured up by human minds from nothing (Sveiby: 1997, 22). It is not exclusionary and can be used by many people at the same time. Firms that are based on intellectual capital have unlimited resources. Knowledge is not exhaustible (Pretnar: 2002, 37-38).

Marginal costs of intellectual capital are negligible (Lev, 2001: 22-23). The increase in intellectual capital decreases marginal costs of production, which in turn enhances the tendency towards increasing returns. Therefore, intellectual capital is not subject to diminishing returns like physical assets. Arthur (1996: 104) argues that there are still two kinds of industries:

- industries where products are produced mainly by traditional resources and less by knowledge or intellectual capital; these industries are still supported by the Marshall law of diminishing returns
- industries based on knowledge and intellectual capital and less on traditional resources; these industries are characterized by increasing returns.

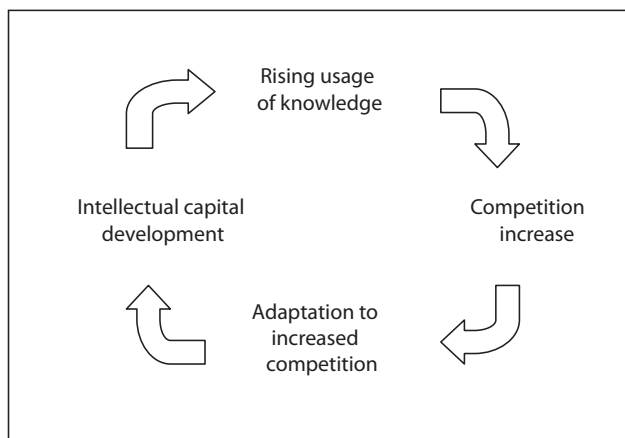


Figure 1: The causation between intellectual capital and competition

According to Arthur, investments in intellectual capital are more profitable than investments in traditional resources.

When investors make decisions, they always look at the market value, which is affected by intellectual capital. The fact is that intellectual capital generates business performance and, consequently, influences market value. Bontis (1998) and Bontis et al. (2000) have already empirically proved the impact of intellectual capital on business performance. Market value is not only affected by financial value, but by intellectual capital, as well (Edvinsson and Malone 1997; Hope and Fraser, 1997; Stewart, 1999; Sveiby, 1997; Brooking, 1998; Roos et al., 2000). The difference between market and book value, called market to book ratio, is rising over time; already in 2000 (Fortune, 2000) intellectual capital was presenting over 90% of market value in some firms (like Cisco, Dell, Microsoft, Intel, Coca-Cola).

### 3.2 Challenge of intellectual capital ownership transformation

Employees create a firm's value that is not under its direct control (Roos et al., 2000: 25). Human capital is much more volatile than structural capital because it is not owned by a firm and can only be rented (Edvinsson, 1997: 369). Structural capital is owned by a firm (Roos et al., 2000: 30), so the firm uses it limitlessly and can trade it. Roos et al. (2000: 30) state that the ownership relationship is more complicated; there are relationships with the firm and not with individual employees. On the other hand, we can see that customers often leave the company with employees. Saint-Onge (1998) says that "owning" the customer is largely a fallacy because customers will go where they perceive there is greater value. Unclear intellectual capital ownership rights often make intellectual capital takeovers possible. Therefore, their prevention is an important challenge regarding intellectual capital.

Un-owned intellectual capital can quickly leave a firm. Turnover of employees represents a barrier to generating and sharing knowledge. Valuable, difficult to replace employee knowledge should be codified and protected. A key role of leadership is the transformation of human capital into structural capital (Edvinsson, 1997: 369). It is necessary to develop mechanisms that provide development and protection of un-owned intellectual capital. Documentation, database creation and knowledge expansion among employees can partly protect human capital and soften the consequences of brain drain. For this purpose, different strategies such as codification and personalization can be used.

Codification strategy (Hansen et al., 1999) enables a transfer of un-owned to owned intellectual capital. Knowledge is codified and stored in databases where it can be used by anyone. Firms that follow a codification strategy rely on "economics of reuse", so knowledge can be used efficiently with products that do not vary a lot. This strategy can be used efficiently with standardized products. Personalization strategy enables knowledge expansion between individuals. Consequently, intellectual capital is

more protected. It is reasonable to use this strategy in cases where products are more individualized and unique.

## 4 The MICO model

An review of literature regarding intellectual capital that considers the challenges of intellectual capital shows that an aggregate view of intellectual capital challenges does not exist. Only singular challenges of intellectual capital in the literature are found. Thus, the purpose of this paper, as already mentioned above, is to consolidate different intellectual capital challenges that authors are attributing to intellectual capital. We can derive three basic intellectual capital challenges (the challenge to reach competitive advantage, the challenge to attain increasing returns and the challenge to maximize market value), the accounting of which enables an asset to be defined as intellectual capital. They can be considered also as conditions to be fulfilled if an asset is forming intellectual capital. Therefore, it is not just knowledge *per se* that defines intellectual capital. Knowledge should be useful in generating competitive advantage, increasing returns and affecting the market value. In this way it creates value and it is not redundant.

There is also the ownership challenge (or the challenge to convert as much as possible un-owned intellectual capital into owned) that encourages the creation of owned intellectual capital with its advantages. It extends the proposed model to define owned intellectual capital.

In order to understand better whether an asset is intellectual capital or not, a MICO model (depicted in Figure 2) to guide in the examination of intellectual capital is proposed. The model is extended to include the creation of owned intellectual capital.

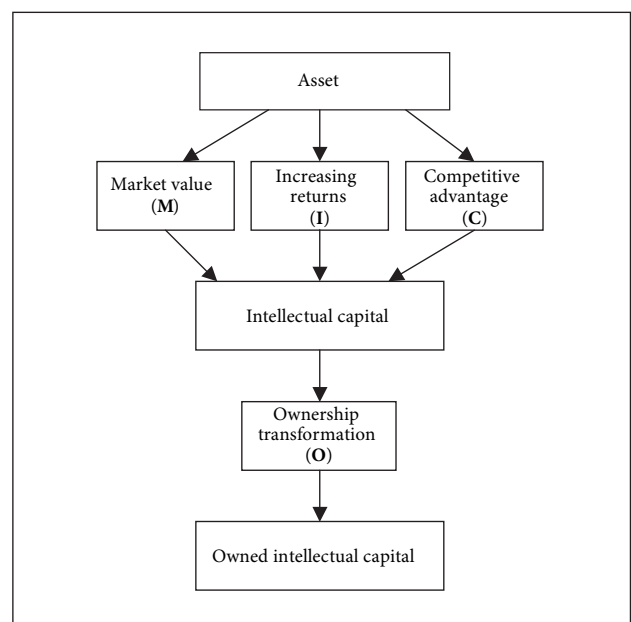


Figure 2: The MICO model of intellectual capital

Accordingly, we can define an asset as intellectual capital if it (a) creates market to book ratio higher than 1 and maximizes it, (b) induces increasing returns, and (c) attains competitive advantage for the firm.

## 5 Conclusion

The theory of intellectual capital is still young and in need of contribution to its ideas and research. In this article, we have examined the challenges of intellectual capital that condition intellectual capital definition and the existence of owned intellectual capital. In this way, the present paper sheds some new light on the process of understanding the characteristics of intellectual capital. The MICO model introduces new criteria in evaluation of intellectual capital. Managers have to evaluate what can be done by the overview of characteristics of assets when they really form intellectual capital. Market to book ratio higher than 1, induced increasing returns and attained competitive advantage are the signs that a firm has intellectual capital. The model extends to define owned intellectual capital. The contribution of the MICO model is in encouraging managers to ask which assets are those on which to concentrate and build the firm.

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