

## INTELLECTUAL CAPITAL AS ONE OF THE FACTORS DETERMINING THE COMPETITIVE POSITION OF DAIRY ENTERPRISES IN LUBLIN VOIVODESHIP (POLAND)

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### **Abstract:**

Competitiveness of enterprise is one of the key issues concerning enterprises nowadays and it is in the area of interest for both theorists and practitioners in economy and management. At present, tangible assets are a secondary factor of growth and the success of the firm is determined by such factors as e.g. ability to gather and exploit information about consumers and competitors and other elements of environment, ability to search opportunities and external threats and their exploitation or avoiding, ability of building permanent relations with environment, ability of creating new products and demand for them, ability to use technologies creatively as well as the ability to shape the organization's structure and culture in the way that allows for maximal use of staff knowledge and competence. These intangible assets play a key role in both selection and allocation of tangible assets and form intellectual capital of enterprise. The aim of the paper is to examine the role of intellectual capital of Lublin region's dairy enterprises in shaping their competitive advantage. The research is based on the 14 dairy enterprises in Lublin Voivodeship divided into four strategic groups. The research is based on the data from financial reports and management reports presented every year in National Court Register. The use of financial reports as empiric material makes carried analysis more objective. The study showed that dairy enterprises strategic groups with the best results in the field of intellectual capital have the best competitive position.

*Keywords: competitive position, intellectual capital, dairy sector*

## 1. INTRODUCTION

The enterprise competitiveness is in current circumstances one of the key issues concerning the enterprises and constitutes a subject of an interest both of theoreticians and practitioners in the range of economy and management. Currently, the competition is performed via creation and/or achieving of a competitive advantage, which is the basic source of better results obtaining on the competitive entities background (Godziszewski, 2001). Obtaining of enterprise advantage in respect to the rivals functioning on the same geographical market is considered as an essential condition of a stable development of part of them in a situation of purchasers' market predominance (Nieżgoda, 2008). The advantage is reflected in obtained by the enterprise competitive positions, while its sources should be sought in owned competitive potential.

High market dynamics, multi-aspect and more rapid surrounding changes and significant differentiation in consumers buying behavior enforce the need of constant search for new activity dimensions and adequate solutions of competitive ability creation and maintenance by the enterprises as their growth basis. Mentioned above conditions cause that material potential of the enterprises becomes distinctly of a secondary significance in development, and market success is determined by the factors like e.g. an ability of gathering and utilization of information about the consumers and competition, as well as other surrounding factors, an ability of searching for the chances and external threats and their utilization or avoiding, an ability of new products formation and creation of the demand for them, an ability of creative utilization of owned technologies, or an ability of formation of organization structure and culture in a way which would allow maximum utilization of the employees knowledge and competences. These intangible elements also play a crucial role in selection and allocation of tangible resources and form so called intellectual capital of the enterprise.

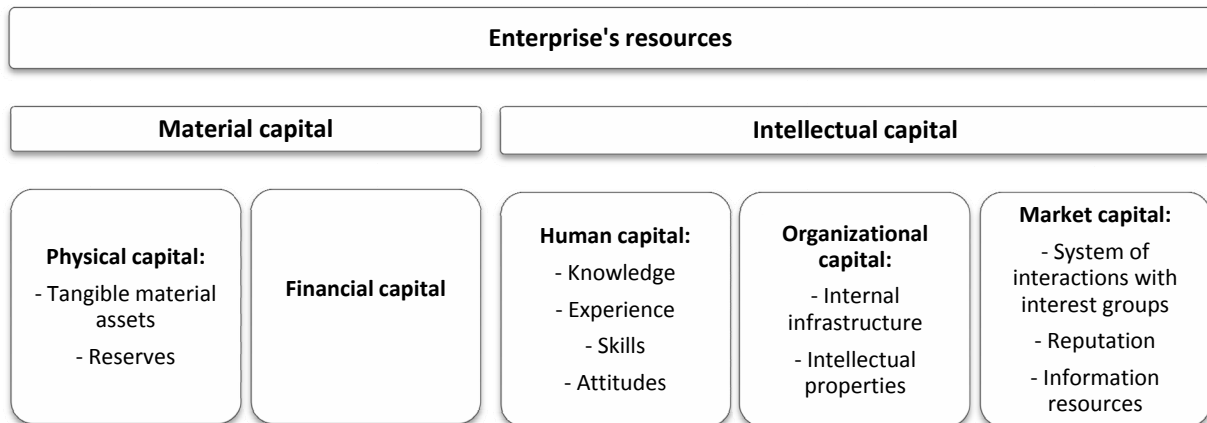
## 2. INTELLECTUAL CAPITAL AS A SOURCE OF COMPETITIVE ADVANTAGE OF THE ENTERPRISE

There are numerous definitions of intellectual capital. This term was used for the first time by Galbraith in 1969, and he defined it as not only pure intellect, but rather a reflection of intellectual activities degree (Dudycz, 2005). In turn Stewart (1997) used this term for determination of "intellectual material: knowledge, information, intellectual property and experience, which may be used for wealth creation", i.e. something "that you cannot touch, but which may make you rich". Edvinsson in turn defined intellectual capital as the knowledge, experience, technology, relations with clients, professional skills, which provide the organization with competitive advantage on the market (Edvinsson, 1997). He also emphasizes the significance of intellectual capital in future value creation saying that this is "the knowledge which may be exchanged on the value" (Edvinsson & Sullivan, 1996).

In the context of managing, an intellectual capital may be determined as "hidden" enterprise's assets which are not fully included in balance reporting of the enterprise. These are the resources of fundamental knowledge and skills of the enterprise. It should be however emphasized that not each kind of knowledge is an intellectual capital. It becomes an intellectual capital when its activity results in a formation the new value, providing an enterprise with measurable market benefits, new product creation, new economic-financial solution, new quality or innovative organizational solution. The value is formed from a range of interactions occurring between all elements of intellectual capital. The process of value creation is a manner in which the knowledge is formed, integrated, transformed and utilized (Stańczyk-Hugiet, 2004).

The importance of intellectual capital in the creation of the enterprise's competitiveness can be explained on the basis on the resource based theory. According to the resource approach, competitive advantage may have its source in better material resources or in distinctive competencies (skills) (Haffer, 2002). Modern recognition of the enterprise's resources is presented on Picture 1.

**Picture 1:** Enterprise's resources – modern approach



Source: own elaboration based on Bratnicki, 2000, p. 50-52, Rowińska-Fronczek, 2001, p. 110-113, Jarugowa & Fijałkowska, 2002, p. 83-87.

It should be emphasized that intellectual capital is of a complementary character relative to material capital. In the present circumstances, the mere fact of material resources possession does not guarantee the entities the competitive advantage achievement. Such warranty is only given by a higher degree of their utilization rationality, and this in turn depends on the intellectual capital owing by the enterprise. Therefore, the participation of any of these areas in competitive advantage achieving by the enterprise cannot be questioned, although a strong tendency to move the center of gravity from the material factors towards intangible ones is distinct, since they prejudice the utilization of material resources of the enterprise and stimuli coming from its surrounding, and determine the sustainability of the enterprise (Kaleta, 2000, Bratnicki, 2000). The intellectual capital of an organization represents the wealth of ideas and ability to innovate which will determine the future of the organization (Sharabati & Jawad, 2010).

Due to the significant impact of intellectual capital on the market and financial results achieved by the enterprise, this element plays an extremely important role in current businesses, including those operating in the dairy sector. Although intellectual capital may be a source of competitive advantage, generally speaking, most organizations do not understand its nature and value (Collis, 1996). Therefore, they should be more aware of the existence of intellectual capital and its vital role in competitiveness creation, and to try to effectively manage its resources in this area.

The key issue is to have reliable information and analyzes of the whole and the individual components of intellectual capital of the enterprise on a background of competitors, which form the basis for making optimal decisions under given circumstances, and in the later stage allow for the verification of their results. Today, measurement, visualization and presentation of this capital is also necessary due to its increasing role in value creation (Adamowicz, 2005).

In practice, the role and value of the intellectual capital are the most often evaluated intuitively, without accurate measurement (Adamowicz, 2005). The difficulty of this type of capital measuring is results from its immateriality, multi-dimensionality and the lack of market valuation of the individual elements.

### 3. MATERIAL AND METHODS

The aim of this study is to evaluate the role of intellectual capital in the Lublin dairy enterprises in formation of the competitive advantage of strategic groups. The study included 14 entities involved in milk processing in the Lublin region. In order to increase the transparency of the assessment, the strategic segmentation of the examined sample enterprises was performed (Domańska, 2009), and two following key strategic dimensions were adopted: the scale of activity (expressed as the value of sales) and the product mix width (as a parameter characterizing the enterprise's commercial offer). Due to the small sample size from a statistical point of view, the simplest method of grouping, i.e. the area method, was used (Halkidi et al., 2001). As a result, four strategic groups of enterprises were distinguished:

1. "specialized producers": SM "Ryki" in Ryki (hard cheese and whey powder), ZM Łaszczów (durable dairy products) and ZM in Łukow (butter) – they are focused on the production of a specific type of product mix;
2. "local dairy plants": OSM in Bychawa, OSM in Janów Lubelski OSM "Piaski" in Piaski, SM in Biała Podlaska and TSM in Tomaszów Lubelski – they offer traditional dairy products aimed mainly on the local market;
3. "diversified enterprises": OSM in Opole Lubelskie, SM "Bieluch" in Chełm and SM "Michowianka" in Michów – they are suppliers of traditional and modern dairy products, which are sold mainly on the regional market;
4. "diversified leaders": OSM in Krasnystaw and SM "Spomlek" in Radzyń Podlaski - modern enterprises, having a very wide product mix for the domestic and foreign market.

The research period were the years 2003-2010, and it was split into two sub-periods: the years 2003-2007 as a period of economic prosperity, and the years 2008-2010 as a time of economic crisis. The empirical material accounted for the information contained in the financial statements and management reports submitted annually by the enterprises in the National Court Register (KRS). The aim of financial statements using as empirical material was to give the objective nature of the analysis performed.

The VAIC™ method, which allows to determine intellectual capital effectiveness, was selected for intellectual capital evaluation. It was elaborated by Pulic (1998) and is determined as VAIC™ (Value Added Intellectual Coefficient™). This is an analytical procedure designed in order to allow the managers, owners and other interest groups associated with the enterprise, an effective control and evaluation of the effectiveness of the added value earned due to the total resources of the enterprise and each of its main components (Firer, 2005). VAIC™ index is a sum of three other factors, i.e. Capital Employed Efficiency (CEE), Human Capital Efficiency (HCE) and Structural Capital Efficiency (SCE) calculated based on the added value. It should be highlighted that three problems arise with most IC measures: firstly the required information is unavailable to those outside the firm; secondly the information is often qualitative and based on judgements and finally the information cannot be translated into quantitative dollar values. VAIC™ does not suffer from these issues as it uses only publicly available, quantitative, and audited information (Clarke et al., 2010).

An evaluation of the competitive position of the enterprises and their competitive advantage in this range was based on the index of possible to maintain the achievable growth rate index of the enterprise (MTW), proposed by Porter (1994). It is a synthetic measure, which is a reflection of the economic situation in the enterprise. This measure is calculated using the following formula (Porter, 1994):

$$MTW = \left(\frac{Psn}{A}\right) \cdot \left(\frac{Wfn}{Psn}\right) \cdot \left(\frac{A}{Z}\right) \cdot \left(\frac{Z}{Kwł}\right) \cdot Zz,$$

where: Psn – sales revenues; A – mean assets state; Wfn – net financial result; Z – debt; Kwł – own capital; Zz – part of profit aimed at development.

However, due to the nature of the analyzed enterprises, the author of this paper introduced a modification to the above formula, involving the conversion of part of the profit allocated for development in the absolute value of the financial result. According to the author, this substitution is justified by two reasons. Firstly, the dairy industry in Poland is characterized by relatively low profitability, and many enterprises operating in this industry has a negative financial result. The occurrence of losses the enterprise has a negative impact on its growth opportunities and it is reasonable that also this negative impact was reflected by the proposed index (Domańska, 2008). Secondly, an analysis of the examined entities documents indicated that in their case, in 2003-2007, the entire value of financial surplus remained in the enterprise, and therefore it can be assumed that it was intended for development.

In order to determine the relationship between intellectual capital (expressed by VAIC™) and competitive position (determined using the MTW), the Pearson's correlation index was used.

#### 4. INTELLECTUAL CAPITAL AND ITS EFFECT ON COMPETITIVE POSITION OF STRATEGIC GROUPS OF DAIRY ENTERPRISES LOCALIZED IN LUBLIN VOIVODESHIP – RESULTS OF THE STUDY

The level of calculated indices characterizing the intellectual capital and competitive position (and advantage calculated on this basis) of the examined strategic groups of dairy enterprises in the Lublin region in 2003-2007 is presented in Table 1.

**Table 1:** Intellectual capital and competitive position of particular strategic groups of dairy sector in Lublin Voivodeship in the years 2003-2007

Specification	Intellectual capital - mean VAIC™ value	Competitive position – mean MTW value [PLN]
GA: "specialized producers"	3,20	1 288 369
GB: "local dairy plants"	2,45	23 767
GC: "diversified enterprises"	2,35	-6 143
GD: "diversified leaders"	2,66	674 602

Source: own elaboration.

An analysis of intellectual capital effectiveness on the basis of the VAIC™ index demonstrated the superiority of GA and GD groups. The highest level was achieved by the GA group enterprises, for which VAIC™ averaged 3.20 in the period 2003-2007 and was about 36% higher compared to the weakest group GC. The second position was occupied by the enterprises from group GD (advantage in relation to the group GC - 13%), closely followed by the group GB (5% advantage). The weakest was group GC with VAIC™ index at an average of 2.35 during the examined period.

The best competitive position of strategic groups in dairy sector in the Lublin region defined using the achievable growth rate index (MTW) was characteristic for group GA. An average level of the analyzed index in the above mentioned group was up by 1.3 million PLN higher (approximately 210-fold greater) compared to group GC, where the level of achievable growth rate was the lowest. In relation to group GD, occupying the second position, the value of the examined index in group GA was higher by 613.8 thousand PLN (nearly 2-fold). Compared to the weakest group, group GD revealed 110-fold advantage (reaching 680.7 thousand PLN) in terms of the analyzed index. The third position in terms of the examined index level was occupied by group GBR, in which the average achievable relative growth rate was higher compared to group GC only of 29.9 thousand PLN (i.e. nearly 5-fold).

As may be concluded from the analysis conducted, the ranking of strategic groups of dairy enterprises located in the Lublin Voivodeship based on VAIC™ index in 2003-2007 was the same as their order in terms of the MTW index, which allows to suppose that intellectual capital affects the competitiveness of enterprises.

The situation in the range of the analyzed indices in the examined strategic groups was subject to strong changes during the economic crisis, which effects in the Polish dairy industry began to be noticeable starting from 2008. The level of indices determining intellectual capital and competitive position in the years 2008-2010 is presented in Table 2.

**Table 2:** Intellectual capital and competitive position of particular strategic groups of dairy sector in Lublin Voivodeship in the years 2008-2010

Specification	Intellectual capital - mean VAIC™ value	Competitive position – mean MTW value [PLN]
GA: "specialized producers"	3,56	-25 406
GB: "local dairy plants"	2,37	-12 268
GC: "diversified enterprises"	2,33	-95 932
GD: "diversified leaders"	1,76	-2 725 286

Source: own elaboration.

During the years of the economic crisis, an effectiveness of intellectual capital determined based on the VAIC™ index was the highest for the group GA, for which VAIC™ averaged 3.56 in the period 2008-2010, and was 2-fold higher in relation to the weakest group GD. The second position was occupied by the enterprises from group GB, which advantage compared to the next group GC was

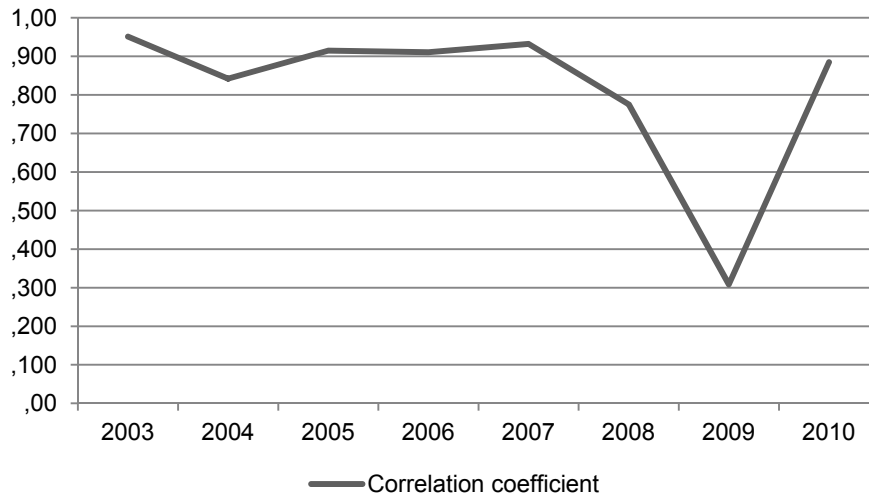
only 2%. Group GC demonstrated 32% advantage over group GD, which in the analyzed period was characterized by the lowest level of intellectual capital effectiveness (1.76).

The best competitive position measured using MTW index was obtained by group GA. An average level of the analyzed index in the above mentioned group was up by 2.7 million PLN higher compared to group GD, where the level of achievable growth rate was the lowest. In relation to the group GA, occupying the second position in terms of competitive position, the value of the examined index in group GB was respectively only 13.1 thousand PLN higher. Compared to the weakest group, group GA demonstrated an advantage in the range of the examined index on a level of less than 2.7 million PLN, and in relation to third in the order group GC - only 70.5 thousand PLN. In the group GC in turn, the achievable growth rate index relative to group GD was higher by as much as 2.6 million PLN.

In the years 2008-2010, the sequence of strategic groups of dairy enterprises located in the Lublin Voivodeship based on the VAIC™ index differed slightly from their rankings in terms of MTW index. While the case of groups GC and GD, the examined groups positions in terms of both examined criteria were the same, in case of groups GA and GB of the order was reversed.

Pearson's correlation index was used in order to more precisely determine the relationships between intellectual capital and competitive position of the examined enterprises (Picture 2).

**Picture 2:** Correlation\* between intellectual capital (measured using VAIC™) and competitive position (expressed using MTW) in dairy sector enterprises in Lublin Voivodeship in the years 2003-2010



\* All correlation coefficients significant at the 5% level or better.  
 Source: own elaboration.

As may be concluded from the data presented in Table 3, in the analyzed period there was a significant relationship between the efficiency of intellectual capital and competitive position of the examined enterprises, while its strength was dependent on external conditions. In times of economic prosperity, the relationship between the two mentioned above categories was high (average correlation coefficient at 0.91), while in the years of the economic crisis it was lower (average correlation coefficient at 0.66). The existence of the relationship between intellectual capital and competitive position measured by various performance indicators<sup>1</sup> confirmed the results of other authors, for example: Clarke et al. (2010), Chan (2009), Ting & Lean (2009), Shiu (2006).

## 5. CONCLUSIONS

During the period of economic prosperity on the market (2003-2007), the best competitive position among strategic groups in the dairy sector in the Lublin region determined using the achievable growth rate index (MTW) was achieved by the group defined as "specialized companies." Also in the years 2008-2010, they maintained competitive position at a relatively high level, ranking in the second position.

<sup>1</sup> MTW is one of measure of performance.

In the years 2003-2007, the second place in terms of competitive position was occupied by the group of "diversified leaders." However, the enterprises of this group were to the highest degree affected by the negative impact of the economic crisis, during which their competitive position deteriorated significantly (from second to the last position).

The third position in terms of MTW index in the time of prosperity was obtained by the group of "local dairies", i.e. the enterprises serving mainly the local market, where the effects of the crisis were the least visible. Among the Lublin dairy plants, just this group coped best in difficult market conditions and despite unfavorable external conditions, achieved the best competitive position in the years 2008-2010.

The worst competitive position both in the years 2003-2007 and in the period 2008-2010 was obtained by the group of "diversified enterprises".

The results obtained by Lublin dairies in terms of competitive position could be linked to the effectiveness of intellectual capital held. The analysis conducted demonstrated that an improvement in the management of intellectual capital in the analyzed entities of the dairy industry was strongly positively related to the improvement of the competitive position measured using the achievable growth rate index. It should be emphasized that the level of this relationship was weaker during the economic crisis. This may be due to the fact that in the difficult market conditions, in addition to the intellectual capital, the competitiveness of the enterprises is also strongly influenced by other factors, such as degree of risk of adopted marketing and financial strategy.

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