

*Janusz Czekał *, Marek Jabłoński **

THE METHODOLOGY OF ANALYZING THE ORGANIZATION'S INTELLECTUAL CAPITAL

The paper presents the methodology of analyzing the organization's intellectual capital. It explains the concept and structure of the intellectual capital, and shows its increasingly important role in creating the organization's value. The authors present research in intellectual capital from the perspective of employee competences, and discuss the principles and guidelines applied in analyzing intellectual capital. The paper also describes and assesses research studies in the analysis of intellectual capital based on the descending structural approach.

Keywords: Intellectual capital analyze, employee's competences, methodology of analyze

1. INTRODUCTION

A review of literature indicates that interest in intellectual capital management has diminished over the last three years. It is difficult to determine whether this phenomenon is due to the fact that some of management concepts and methods are running out of fashion, or it results from the insufficient development of the tools which would facilitate the practical implementation of those concepts.

However, the increasing significance of intellectual capital as the organization's intangible asset and its decisive role in developing corporate competitiveness and expansion potential are unquestionable. It is likely that the lack of the awareness of the need for the significance and benefits of effective intellectual capital management mainly results from the difficulties related to the operativeness of this economic concept and insufficiently developed analytical methods. Intellectual capital may be viewed as a factor stimulating creativity, entrepreneurship, innovativeness, the ability to introduce change, the effectiveness of decision-making processes – a complex concept which is not easy to measure. Consequently, researchers face a number of barriers and methodological challenges.

* Organization and Management Methods Department, Cracow University of Economics

This paper is an attempt to contribute to an analysis of managing the organization's intellectual capital, and it proposes a methodology of analyzing the intellectual capital in which employee competences play a key role.

2. INTELLECTUAL CAPITAL – A COMPONENT OF THE ORGANIZATION'S VALUE

One of the major indicators of the organization's competitive position is its market value. Most researchers agree that the organization's market value is not only conditioned by financial capital (presented in the company's balance sheet), but also intellectual capital (Petty, Guthrie 2000; O'Regan et al, 2000; Kwiatkowski 2000; Kwiatkowski, Edvinsson 2000; Warschat et al, 1999; Sveiby 1997; Steward 1997).

Intellectual capital is the major component of all the assets consciously or less consciously possessed by the company as well as hidden (intangible) assets (Bontis, Girardi 2000). It represents the monetary value of knowledge used in the organization (Wick 2000), also defining its learning potential (Armstrong 2000). For example, Skandia identifies intellectual potential with its knowledge, skills, experience, organizational technologies and relationships with clients, which guarantee the maintaining of the company's competitive edge (Edvinsson 1997).

A review of the commonly used concepts of intellectual capital indicates that it may be considered in a broad or narrow sense. Intellectual capital in a narrow sense is usually identified with human capital viewed as knowledge and skills contributed by individuals to their work place as well as employee skills and abilities which are indispensable to solving the problems which are regarded by clients as significant (Dobija 2002). Intellectual capital in a broad sense includes, as proposed by German researchers, four interlinked elements: human capital, organizational capital, market capital and innovative capital (see: Table 1) (Warschat et al, 1999), and it manifests itself as the difference between the organization's market and book value. This is a different approach than the commonly applied concept developed by L. Edvinsson and M. Malone of the structure of intellectual capital including human and structural capital (Edvinsson, Malone 2001, p. 40). The first, static approach stresses the "location" of knowledge and hidden assets, while the other, dynamic approach focuses on the sources of knowledge and

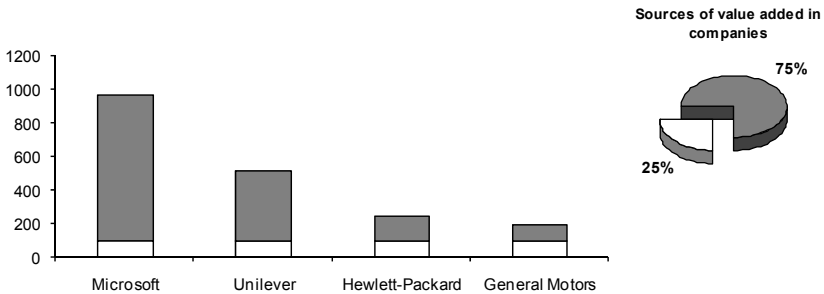
hidden assets which are indispensable to maintaining a competitive advantage.

Table 1
Components of intellectual capital in a broad sense

Human capital	Organizational capital	Market capital	Innovative capital
competences attitudes leadership and development	processes infrastructure culture management	relationships with clients relationships with suppliers market competences other relationships	improvements in processes products and services technologies

Source: Warschat et al, 1999

The results of current research indicate that independently of the adopted approach, intellectual capital should be viewed as a major component of corporate value (see: Fig.1). For example, in 1986, the net assets of Merck accounted for 12.5%, in 1996, they accounted merely for 4% of Coca-Cola, and at Microsoft – 6% of their respective market values (Bontis et al, 1999). In the industries in which the consumer is a source of the company's market success, intellectual capital may determine up to 75% of the organization's added value (Sveiby 1997). The above statement may be confirmed by the results of research conducted as part of the OECD Growth Project, which show a relatively strong correlation between hidden assets, GDP and an increase in productivity in business entities (see: Eustace 2000).



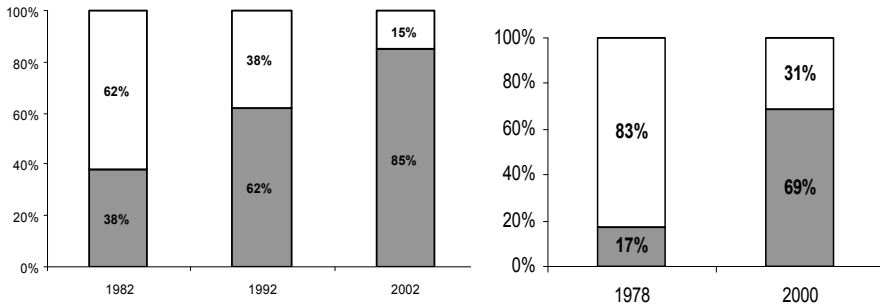
Book value (white area) and remaining market value (shaded area)

Figure 1. Market and book value and sources of value added in selected companies

Source: Sveiby 1997

It should be noted that over the past decades the gap between company assets estimated on the basis of historical costs and a much higher level of market capitalization has been rising steadily. Standard and Poor's 500 (S&P), which defines the relation between the market value and the balance sheet value of the 500 largest companies listed on US exchanges, rose steadily from 1980, reaching the level of 6.0 in March 2001, which implies that an average amount of \$6 of the market value corresponds to \$1 in the company's balance sheet. The remaining part, i.e. \$5, includes the value of company intangible assets per every dollar in the balance sheet (Weatherly 2003).

Research conducted by The Brookings Institution indicate that in 1982, the assets recorded in the balance sheets of the US 500 largest listed companies represented, on average, 62% of the market value, while in 1992 the respective share dropped to 38% (Blair 1995, see: Weatherly 2003), further falling in 2002 to merely 15% (Weatherly 2003). On the other hand, A. Singer and J. Calton state that in the United States in 1978, the book value of measurable assets (included in the balance sheet) in non-financial corporations stood at the level of 83% of market capitalization, accounting for merely 31% of companies' market value in 2000 (see: Fig. 2). Those researchers believe that the gap between the market and book value depends on the extent to which organizations rely on knowledge and information (Singer, Calton 2001).

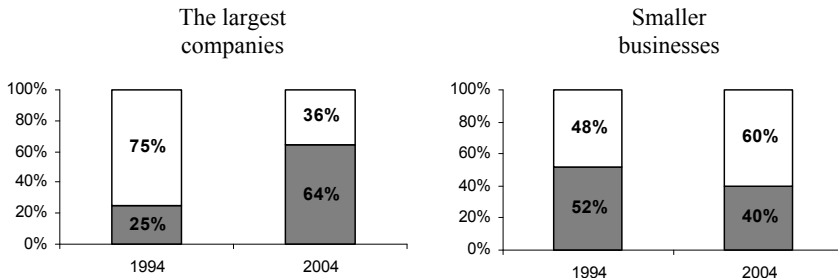


Book value (white area) and remaining market value (shaded area)

Figure 2. Accumulated market and book value of US listed companies

Source: author's own research based on Weatherly 2003; Singer, Calton 2001

It becomes clear that the trends in the relations between the company's book and market value are also related to the company's size. Research conducted by L. Bryan and M. Zanini indicates that in the largest companies (150 of the largest US listed companies) the book to market value proportion fell from 75% to 36% in 1994-2004, while it rose in smaller companies from 48% to 60% (see: Fig. 3) (Bryan, Zanini 2005). This implies that the share of intellectual capital in the largest companies is greater than that in smaller businesses, and it displays a tendency to rise. In view of the above, intellectual capital has become one of the key assets in organizations, especially large global companies, conditioning their competitiveness and expansion; these companies make an effective use of overseas knowledge resources, being much more successful than smaller businesses. For example, according to W. Lewis, US modern supermarkets are 4-5 times as effective as small family businesses (Lewis 2005, p. 264).



Book value (white area), remaining market value (shaded area)

Figure 3. Book to market value in US largest and smaller listed companies

Source: author's own research based on Bryan, Zanini 2005

3. EMPLOYEE COMPETENCES – A BASIS FOR ANALYZING THE ORGANIZATION'S INTELLECTUAL CAPITAL

The organization's intellectual capital reflects its ability to expand and generate appropriate future value (Bontis 2001; Bontis, Girardi 2000, Bontis, Nikitopoulos 2001, Crossan et al, 1999). A risky assumption may be made that it mainly relies on employee competences. Such an assumption may be confirmed by referring to the views held by other researchers.

According to T. A. Steward, intellectual capital includes the sum of all the knowledge possessed by the company's employees, which determines the company's competitive position (Steward 1997). Thus, it is an intellectual asset which encompasses knowledge, information, intellectual property and experience that may be used in creating the company's wealth (Steward 1991). It results from the company's knowledge assets at a given point in time (Bontis et al, 2002). Therefore, it should not be considered independently of employee competences.

The fact that it is justified to consider and analyze intellectual capital from the point of view of employee competences is also referred to by D. Ulrich and M. Dobija. Ulrich views intellectual capital as the product of competence and motivation, while Dobija claims that intellectual capital is mainly related to the human being who is a triad of the body-mind-spirit construct, thus constituting its attribute (Dobija 2002).

Intellectual capital is positioned “at the cross-border” of resources, while the function of the basic integrator of organizational components is performed by the human individual. In taking different decisions, the individual configures the organization's resources and sub-systems in the process of creating the company's value which is also reflected in the potential of its intellectual capital. The value of intellectual capital is not embedded in the resources but in the relations between the resources managed by the organization's members. In justifying the above statement we may refer to Penrose's theory of growth of the firm which claims that the company's material resources are purchased at the price which reflects the scope of functions performed by the company. Consequently, the use of a given asset changes the scope of the performed functions. Therefore, the organization's members, making use of their competences and specific tangible assets, may extend (but also reduce) the potential scope of performed functions, thus increasing the organization's knowledge (Penrose 1959, pp. 78-79). In fact, company hidden assets, especially employee competences, determine the relations between tangible and human resources. For this reason, an analysis of the intellectual capital may not be confined to identifying the share of intangible and fixed assets (for example, the proportion of computers and employees, expenditure for training, etc.) – the frequently applied method in analyzing intellectual capital (sometimes referred to by their authors as measurement methods). Such an analysis should rather concentrate on the degree to which the relations between fixed and intangible assets lead to the decisions which strengthen the company's competitive position the decisions indirectly reflecting employee competences.

Employee competences represent the organization's only resource which is present in all business activities, and its significance increases in the process in which the border-line between the organization and its environment disappears. It may be claimed that the organization's competitive advantage relies not on typical information resources but a specific category of information – information about information – so called metainformation (Preiss 1999). The company's market success is mainly conditioned by the availability of human resources – in its close and remote environments – viewed as the sources of information and potential business partners. As a result of adopting a strategy of openness to information and cooperation with the environment (institutions and people), the set of people involved in creating and disseminating information and innovations expands. This approach to intellectual capital may be referred to Bill Joy, a co-founder

of Sun Microsystems, who claimed that “there are always more smart people outside your company than within it” (Rybiński, 2006).

The strategy of information and intellectual openness corresponds to the current trends in contemporary companies’ environments in which decision-makers establish relations with the world of politics, culture and science, develop Public Relations activities and create lobbying groups, trying to exercise control over the factors which affect companies. Such activities are effectively carried out by large organizations with considerable financial resources and a great number of stakeholders. Small business entities are also involved in such undertakings in order to protect their interests and maintain market positions.

4. PRINCIPLES AND GUIDELINES APPLIED IN ANALYZING INTELLECTUAL CAPITAL

It may be inferred from the above considerations that an analysis of intellectual capital is a significant problem in the contemporary theory of management. A properly conducted analysis is a basis for developing a strategy for creating and expanding the organization’s intellectual capital. It should have the characteristics of an *ex ante* analysis, and provide answers to some fundamental issues:

- Does the organization in question have suitable resources to implement its strategies?
- Does it make effective use of the available resources?
- Does it effectively combine its tangible and intangible assets in order to increase its hidden assets which are converted to market-oriented products and services?
- Does it effectively develop its hidden assets to gain and maintain a competitive edge?

The below proposed methodology of analyzing intellectual capital, focused on achieving specific targets, is based on a systemic approach and the valuation of the intellectual capital developed by J. Strużyna (2002). Reference to an analysis of intellectual capital seems justified, because regardless of the scope and accuracy of research, this methodology is usually related to the function of identification and valuation.

In the systemic approach a starting point for an analysis of intellectual capital is the entity’s internal efficiency, i.e. employee competences, while the target of the analysis is the organization’s image and the way it is viewed

by the environment, which represents the organization's key competences. Therefore, an analysis of intellectual capital should be started with one variable organization (treated as an input variable), and not all of them simultaneously – as in the case of the analyses of intellectual capital based on the Edvinsson/Malone concept. Its basic component is the identification of employee competences for a work station, a group of work stations, an employee and/or a working team from the perspective of a complex strategy and the development of the company's intellectual capital. Consequently, research studies should be based on the principle of taking specific steps applied, among others, in the method of the objectives tree (Trocki 1977) or the value analysis (Lisiński, Martyniak 1981), which consists in decomposing the organization's main goal into sub-goals. The main goal of the proposed analysis of the intellectual capital is to develop a strategy (and the determinants of the organization's key competences), while the sub-goal is to identify appropriate employee competences at the organization's particular levels of management.

The action framework for the proposed method includes 7 phases. Phase 1 *identifies a strategy and the organization's key competences*. The organization's strategy is a basis for analyzing its key competences. It makes it possible to determine whether the competences are suitable in terms of encouraging the achievement of strategic plans.

Phase 2 *identifies the organization's key success factors (KSF) and their indicators*. Key success factors are the major determinants of the company's functioning, impacting on its future success; they may include processes, standards, routine procedures, etc. which are decisive in implementing the adopted strategy (see: Table 2).

Table 2
Examples of success factors

Company	Major success factors
Merck	Length of R&D cycle
Federal Express	Monitoring of delivery routes
Wal-Mart	Distribution system in department stores
3M	Entrepreneurship culture and appreciation of new ideas
Motorola	Six Sigma quality
Honda	Low capacity engine
Pepsico	Penetration of foreign markets
Caterpillar	24-h servicing worldwide
Domino's Pizza	Immediate delivery

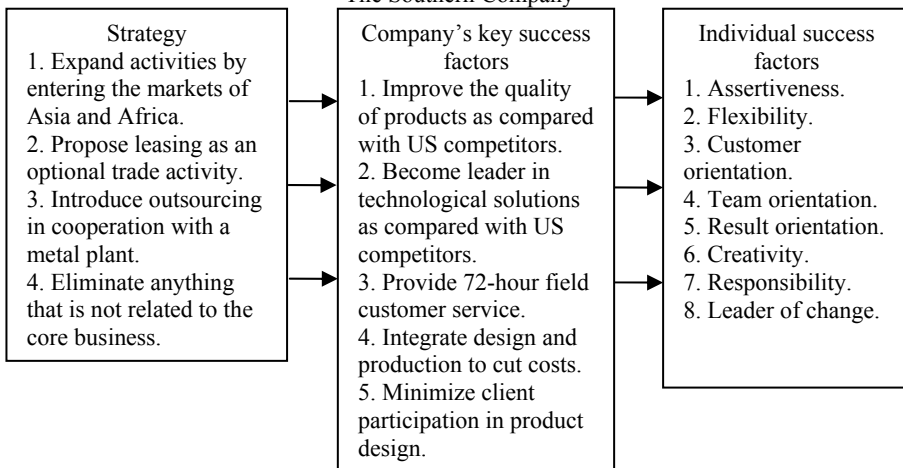
Source: Schneider, Beaty 1994, p. 323, see: Mastyk-Musiał 2003, p. 118.

The indicators are variables which have an impact on maintaining and developing the organization's key success factors. For example, if the process is a key success factor, its determinants may include product design, material, manufacturing methods, or the manufacturer. Key success factors identify business targets and specify the resources which are necessary to achieve a given objective (Steinmann, Schreyögg 2001, p. 141, pp. 149-150). Consequently, the identification of key success factors and their determinants is a basis for identifying the company's core activities which allow it to gain a competitive advantage as well as those areas which require support. Hence, following the identification of determinants along with the previously defined resources, it may be determined which resources contribute to key success factors and which of them have an adverse impact.

Phase 3 *transfers key success factors to the level of competence of individual employees*. On the basis of the results of the implemented phases, the organization's strategy is first formulated and the corresponding key success factors are identified to be followed by the identification of individual success factors. An example of the three discussed levels – the organization's strategy, key success factors and individual success factors for The Southern Company (a production company) is presented in Table 3.

Table 3

Relations between strategy, key success factors and individual success factors – the case of The Southern Company



Source: author's own research on the basis of Schneider, Beaty 1994, p. 334, see: Masłyk-Musiał 2003, p. 235

In the next phase of *defining intellectual capital* appropriate categories and components of the organization's intellectual capital are attributed to key success factors, individual success factors and their determinants. In this context, the use of the static structure of intellectual capital is recommended including human, organizational, market and innovative capital. In implementing this phase it is necessary to consider the unique character of a given business entity because – as claimed by J. Roos, G. Roos, N. C. Dragonetti and L. Edvinsson – an analysis of intellectual capital components, assigning weights to them, and determinants are dependent on the company's strategy, the form and unique character of its current activities (see: Roos et al, 1997).

The next phase *defines key employee competences* required at the particular work stations, determined on the basis of lower rank employee competences (eg employee competences at a lower level of the organizational structure). Key competences for the particular employees should be determined in a way which ensures the maximization of the determinants of the particular components of the company's intellectual capital (see: Fig. 4).

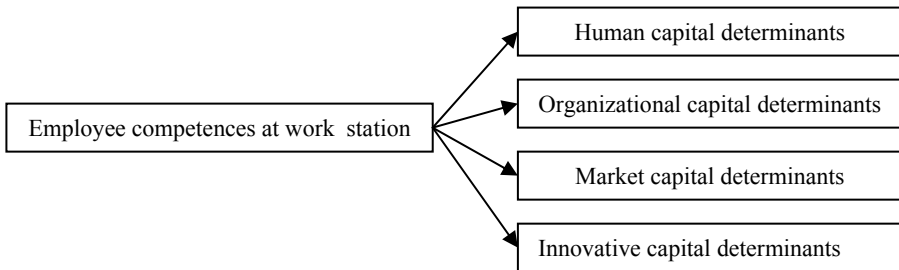


Figure 4. A scheme for defining employee competences which determine the indicators of the company's intellectual capital

Source: author's own research

Therefore, the next phase *defines employee competence profiles*. They should be referred to work station functions and team work effectiveness. The determinants of intellectual capital components are included in the criteria for the particular work stations on the basis of the adopted plan and an outline of classification corresponding to determinant criteria included in the company's intellectual capital model. The classification outline facilitates the development of a data questionnaire in which all determinants

are specifically described in terms of their unique characteristics. The identification of the specific characteristics of the determinant, in turn, facilitates the evaluation of its weighting and quality, ensuring measurability, comparability and interpretability. The operativeness of the above method of determining competence profiles for the particular work stations consists of defining the necessary sets of competences for the organization's specific organizational entities. In the next step the defined competences are assigned to managerial positions, and the necessary competences are defined which are indispensable to the employees of a given organizational unit (see: Fig. 5).

The final phase focuses on the *hierarchy of employee competences* from the point of view of creating value added. First, it is determined which work stations or organizational units create or increase the added value – raising the level of the organization's intellectual capital – and which of them lower that level, or do not have any impact. The confrontation of this classification against the attributes of employee competences facilitates the identification of leading and auxiliary competences, and leads to defining the organization's hierarchy of needs with respect to the development of its intellectual capital. It confirms the significance of employee competences as the carriers of the added value. The attributes of employee competences are described by means of the appropriate determinants of intellectual capital components. Such a classification of employee competences for the particular posts or units facilitates the development of an employee competence map for a given organization. As a result, individual leading and auxiliary competences may be indicated which influence the intellectual capital related to the company's work stations and organizational units. Also, the developed map identifies trends in developing the company's intellectual capital and the necessary changes in employee competences in specific sub-systems which lead to the strengthening and developing of the organization's key competences. Also, it indicates the function and significance of auxiliary employee competences for the leading work stations and the entire organization. Finally, it reveals the competence gap, defining those employee competences which are not available within the organization and which should be acquired from external sources.

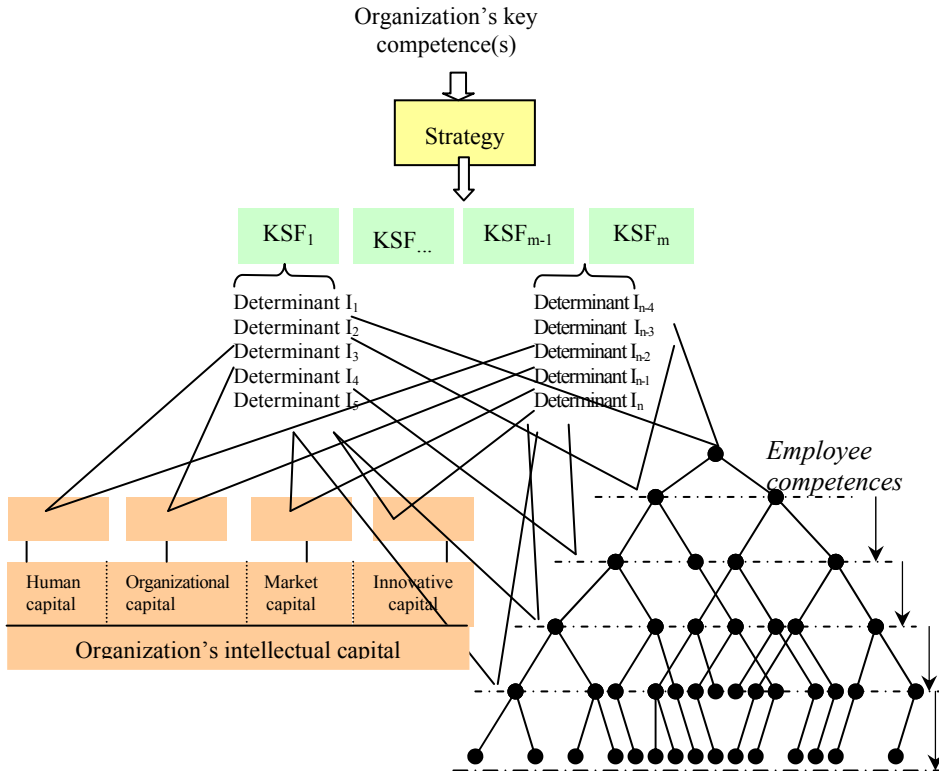


Figure 5. Framework guidelines for analyzing intellectual capital

Source: author's own research

5. CONCLUSIONS

The presented methods facilitate a structured analysis of the company's human resources, and the obtained results constitute a basis for developing a strategy for intellectual capital development and decision-making in the area of employee competence expansion and its positioning in the organizational structure. The obtained results may also be used in a comparative analysis of the available or desirable intellectual resources in the company's organizational units as well as the processes related to intellectual capital

structure such as the speed of competence development, changes to employee attitudes, etc. The presented methods of analyzing intellectual capital are suitable for those areas and aspects of the organization's functioning which strengthen the company's competitive position: its quality, flexibility, innovativeness, etc. Therefore, the research study focuses on defining those components of employee competences which strengthen, weaken or do not affect a given category of intellectual capital determinants.

The structural approach on which the presented methodology is based, facilitates a review of the organization's resources including the adopted strategy, key success factors, their determinants as well as different categories and components of intellectual capital. It specifies the organization's strategy and identifies its key resources, especially intellectual resources. It sets the necessary criteria to be met by the organization's sub-systems (divisions, units and organizational posts) as well as decisions and activities which contribute to a competitive strategy.

The proposed approach, however, does not include, to a sufficient extent, the analysis of intellectual capital as discussed in Porter's value chain. The underlying concept of creating the added value consists in the appropriate combining of one process with another – a primary one with a secondary one (e.g. selection of information with decision taking, mentoring with developing employee competences, etc.). Therefore, in an overall analysis of the organization's intellectual capital the ascending approach should be added to the descending approach, making it possible to quantify the added value at the organization's decision-making centres which ultimately lead to products and services and the company's adopted strategy. The descending approach in an analysis of the intellectual capital is a basis for building *common understanding* with regard to key resources used in implementing the strategy, and it provides *know-what* in the area of factors which stimulate the growth of the company's hidden assets. The ascending approach, on the other hand, identifies an increase in the added value at the subsequent links of the organization's value chain, giving insights into the factors which develop the organization's resources, and it identifies their impact (significance) on the process of corporate value creation. Thus, it specifies the quality of factors which increase the value of the company's intellectual capital. Because of the specific character of the company's hidden assets an analysis of the intellectual capital, apart from the integration of the above discussed approaches, should also include a quantitative and qualitative approach, considering the organic possibilities in the approach to the organization's resources (see: Czekaj, Jabłoński 2004).

REFERENCES

- Armstrong, M., *Zarządzanie zasobami ludzkimi [Human capital management]*. Dom Wydawniczy ABC, Kraków, 2000.
- Blair, M., *Ownership and control: rethinking corporate governance for the twenty-first century*, The Brookings Institution, Washington DC, 1995, chapter 6.
- Bontis, N., *Assessing Knowledge Assets: A review of the models used to measure intellectual capital*, "International Journal of Management Reviews", Vol. 3, No. 1, 2001.
- Bontis, N., Crossan M., Hulland J., *Managing an organizational learning system by aligning stocks and flows*, "Journal of Management Studies", Vol. 39 No. 4, 2002.
- Bontis, N., Dragonetti, N. C., Jacobsen, K., Roos, G., *The knowledge toolbox: A review of the tools available to measure and manage intangible resources*, "European Management Journal", Vol.17, No. 4, 1999.
- Bontis, N., Girardi, J., *Teaching knowledge management and intellectual capital: An empirical examination of the Tango Simulation*, "International Journal of Technology Management", 20(5/6/7/8), 2000.
- Bontis, N., Nikitopoulos, D., *Thought leadership on intellectual capital*, "Journal of Intellectual Capital", Vol. 2 No. 3, 2001.
- Bryan, L. L., Zanini, M., *Strategy in an era of global giants*, McKinsey Quarterly, No. 4, 2005.
- Crossan, M., Lane, H., White, R., *An organizational learning framework: From intuition to institution*, "Academy of Management Review", Vol. 24, No 3, 1999.
- Czekaj, J., Jabłoński, M., *Wybrane wytyczne metodyczne analizy kapitału intelektualnego organizacji [Chosen directives for methodological analysis of human capital of an organization]*, „Przegląd Organizacji”, Nr 10, 2004.
- Dobija, M., *Kapitał ludzki i intelektualny w aspekcie teorii rachunkowości [Human and intellectual capital in the light of accounting theory]*, „Przegląd Organizacji”, Nr 1, 2002.
- Edvinsson, L., *Developing intellectual capital at Skandia*, "Long Range Planning", Vol. 30, Nr 3, 1997.
- Edvinsson, L., Malone, M. S., *Kapitał intelektualny [Intellectual capital]*. Wydawnictwo Naukowe PWN, Warszawa, 2001.
- Eustace, C., *The Intangible Economy – Impact and Policy Issues, Report of the European High Expert Group on the Intangible Economy*. European Commission, Enterprise Directorate-General, Brussels, 2000.
- Kwiatkowski, S., Edvinsson, L., *Knowledge cafe for intellectual entrepreneurship*, Academy of Entrepreneurship and Management, Warszawa, 2000.
- Kwiatkowski, S., (2000), *Przedsiębiorczość intelektualna [Intellectual entrepreneurship]*. Wydawnictwo Naukowe PWN, Warszawa, 2000.
- Lewis, W. L., *Potęga wydajności [The power of efficiency]*. Wydawnictwo CeDeWu, Warszawa, 2005.
- Lisiński, M., Martyniak, Z., *Analiza wartości organizacji [Analysis of an organization's value]*. Książka i Wiedza, Warszawa, 1981.

- Maslyk-Musiał, E., *Organizacje w ruchu [Organizations in movement]*. Oficyna Ekonomiczna, Kraków, 2003.
- O'Regan, P., O'Donnell, D., Kennedy, T., Bontis, N., Cleary, P., *Perceptions of intellectual capital: Irish evidence*, "Journal of Human Resources Costing and Accounting", Vol. 6, No 2, 2001.
- Penrose, E. T., *The theory of the growth of the firm*. Basil Blackwell, Oxford, 1959.
- Petty, R., Guthrie, J., *Intellectual Capital review – measurement, reporting and management*, "Journal of Intellectual Capital", Vol. 1, No. 2, 2000.
- Preiss, K., *Modelling of knowledge flows and their impact*, "Journal of Knowledge Management", Vol. 3, 1999.
- Roos, J., Roos, G., Dragonetti, N. C., Edvinsson, L., *Intellectual Capital: Navigating in the New Business Landscape*. Macmillan, London, 1997.
- Rybiński, K., Globalizacja w trzech osłonach, część 1 pt. Outsourcing, offshoring i networking jako przyczyny pojawienia się homo sapiens globalis w XXI wieku [Globalization In Tyree scenes. Part one: Outsourcing, offshoring and networking as reason of emergence of "homo sapiens globalis" in the 21st century]. http://rybinski.eu/wp-content/uploads/offshoring_061027.pdf, Accessem 14.12.2006.
- Schneider, C. E., Beaty, R. W., *Making cultural change happen*, in: (eds.) Berger, L. A., Sikora, J. M., Berger, D. R., *The change management handbook. A Road map to corporate transformation*. McGraw Hill, New York, 1994.
- Singer, A. E., Calton, J., *Dissolving the digital dilemma: meta-theory and intellectual property*, "Human System Management", Vol. 20, No. 1, 2001.
- Steinmann, H., Schreyögg, G., *Zarządzanie, podstawy kierowania przedsiębiorstwem, koncepcje, funkcje, przykłady [Management and Basic business administration: Concepts, functions, cases]*. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław, 2001.
- Steward, T. A., *Brainpower: how intellectual capital is becoming America's most valuable asset*, Fortune, 3 June, 1991.
- Steward, T. A., *Intellectual Capital. The New Wealth of Nations*. Nicholas Brealey, London, 1997.
- Strużyna, J., *Obrazy kapitału całkowitego firmy*, „Organizacja i Kierowanie”, Nr 1, 2002.
- Sveiby, K., *The New Organizational Wealth*. Berrett-Koehler, San Francisco, 1997.
- Trocki, M., *Metody drzewa celów [Methods of goal trees]*, in: M. Stępowski, *Nowe techniki organizatorskie [New organizational techniques]*. PWN, Warszawa, 1977.
- Warschat, J., Wagner, K., Hauss, I., *Measurement System for the Evaluation of R&D Knowledge in the Engineering Sector, Report on Workshop Intellectual Capital/Intangible Investments 22nd November*, European Commission, 1999.
- Weatherly, L. A., *The value of people: the challenges and opportunities of human capital measurement and reporting*, "Human Resources Magazine", Vol. 48, No. 9, special edition, 2003.
- Wick, C., *Knowledge management; Communication of technical information*, "Technical Communication", Vol. 47, No. 4, 2000.

Received: January 2009