



Human Capital as a Challenge for Economics Theory

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The issue of human capital is increasingly attracting the attention of both theorists and practitioners, because at present human resources play a decisive role in the creation of competitive economies and business entities. Human capital and knowledge are becoming key factors in the area of entity competitiveness. Consequently, human capital is currently being analysed in a multi-faceted way in the context of numerous economic theories. The aim of this study is to summarize, analyse, and synthesise the information published on the subject of the theory of human capital and to present new theories and scientific paradigms. The theories presented in this study show that employees constitute the basic capital of modern organizations. One of the contemporary paradigms of modern management is the concept of knowledge-based economy and the paradigm of information technology. This article is based on literature studies and theoretical reflections of the author.

Keywords: human capital, the theory of human capital, intellectual capital, knowledge, information, knowledge management, knowledge-based economy

Introduction

The approach to the issue of skills, education, experience, and human attitude as a form of capital has been evolving over the years, together with the development of economic theories. When analysing the literature on the subject, one can notice two main trends. To summarise the first approach, W. Petty claimed that a human being should be treated as capital, which provides the basis for the estimation of his or her value. The second approach, the pioneers of which were A. Smith, J. S. Mill and J. B. Say, discusses the separation of a human being from his or her capital in the form acquired skills, knowledge and abilities.

Nowadays, the perception of the essence of human capital at a macro level, in relation to an organizational or an individual basis, is complex and diverse, which gives rise to many different concepts. Currently, the rules of human capital development in a modern enterprise are determined by the concept of knowledge management.

The aim of this study is to summarize, analyse, and synthesise the information published on the subject of the theory of human capital and to present new theories and scientific paradigms. Human capital is a constituent of the intellectual capital, thus this study refers to the theory of

intellectual capital and knowledge management. Furthermore, the study emphasizes the increasing role of information in human activities, and the prevalence of new technologies in today's world. In order to portray the complexity of this subject, the study also presents concepts and theories concerning human capital that have been developed so far, as well as the analysis of human capital. The study shows the leading role of the paradigm of knowledge-based management and information technology. Consequently, the author attempts to justify the hypothesis that human capital constitutes the basic source of economic growth in contemporary knowledge-based economies. This article is based on literature studies and theoretical reflections of the author.

Human Capital in Economic Thought

Reference literature on the subject, as well as business practices show a constantly growing interest in the role of knowledge, skills, and qualifications of people in the economic growth and hence the competitiveness of the whole economy and of individual enterprises. The evidence of the evolution of human capital development can be found in many economic trends that have existed over the centuries: at the beginning, in the form of various expressions and unclear views concerning mainly the role of a human being in the economic system of countries, and then in the processes of work. The first mention of this subject dates back to the antiquity – this subject is featured in the views of many thinkers, e.g. Xenophon (430–355 BC), the pioneer in the field of economics, Cato (234–149 BC) and Varro (116–27 BC). They presented a positive attitude to the division of labour and specializations, which are reflected in the quality of products. Apart from the division of labour among masters and slaves, Xenophon considered the division of labour according to professional qualifications, pointing out the correlation between efficiency growth and skills (Stankiewicz, 2007).

The first concepts attributing work with the creation of wealth surfaced in Western Europe at the turn of the 16th and 17th centuries, during the period of growth of economic thought prior to the development of science. One of the first economists in the world who perceived the role of a human being in economic processes was T. Mun (1571–1641), a leading theorist of mercantilism (Spychalski, 1999).

Views of Classical Economists

In the 18th century, as a result of the industrial development, the economic growth of a country was believed to be closely related to the development of production, and consequently, more attention was paid to one of the factors of production, namely labour, which was recognized as the main source of wealth of a country. This, in turn, contributed to a greater interest in the quality of work, and more precisely – qualifications.

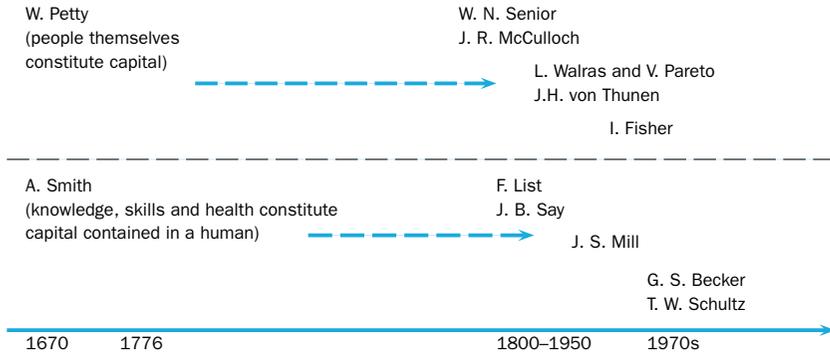


Figure 1 The Views of Classical Economists on a Human Being in Terms of the Capital (adapted from Łukasiewicz, 2009)

When analysing the works of economic theorists on the subject of the theory of human capital, one may distinguish two approaches to the analysis of human existence in terms of capital (Figure 1). According to the first approach, an individual is equal to capital, which is reflected in the views of William Petty. Other economists followed him, among others: William Nassau Senior, John Ramsey McCulloch, J. H von Thunen, and mathematicians Leon Walras and Vilfredo Pareto. This view was also shared by many other scholars, who at the turn of the 19th and 20th centuries adopted the assumption that people constitute a special form of capital – they also attempted to prove its value.

The second approach was associated with A. Smith, according to whom the knowledge, skills and health of a human being constitute capital, but people themselves should not be considered as capital. This view was shared by economists such as: F. List, J. S. Mill, and J. B. Say, who were later joined by T. W. Schulz and G. S. Becker. The second approach was strengthened by the development of the concept of human capital in the second half of the 20th century.

Quantitative Approach

W. Petty was one of the first to include a human being in the general category of capital. He is thought to have created one of the main research trends according to which people themselves constitute capital and wealth. Petty attempted to prove that it is not money or things that constitute wealth, but human beings themselves. Capital contained in a human being – including skills and professional qualifications – was, according to Petty, one of the four factors, apart from land, labour, fixed assets, and materials – that create national wealth. Although he still considered land and work as the most essential factors, he stressed that qualifications make work more efficient (Domański, 1993). Petty was involved in population invento-

ries and he perceived human resources as the aspect of work that creates national wealth. He expressed his views in his estimation of the national wealth of England, when he considered 'the value of people' as exceeding the total value of the country's material wealth by 70% (Stankiewicz, 2007). Petty's estimation of the 'value of people' was a convincing evidence that he considered labour and human beings as the main source of national wealth.

Qualitative Approach

A. Smith (1723–1790) had much more developed views on the subject and he presented them in his fundamental work entitled: 'An Inquiry into the Nature and Causes of the Wealth of Nations' published in 1776. He included human skills in the categories of capital. He stressed the similarity between the qualifications of workers and properties of tangible assets.

A. Smith should be considered a pioneer of economic views concerning education. He emphasized the need to spend money on education. Money spent on education should be treated in the same way as, for instance, investment in the purchase of machinery. Smith, contrary to Petty, claimed that a human being and capital contained in a human being in the form of acquired skills should be treated separately. Although skills constitute a part of an individual's wealth, they are, at the same time, an element of the wealth of a given society to which this human being belongs. He assumed that skilled work – the complex one – is more efficient than simple, unskilled work, and costs incurred for education should be reflected in the form of higher remuneration. Therefore, qualifications and the level of difficulty related to the performance of a given task should determine differences in payment. Such differences in remuneration constitute profit on investment (Jarecki, 2007). Furthermore, A. Smith paid attention to the aspect of non-material benefits an individual derived from education. According to A. Smith, one of the ways of improving the skills was the division of labour, namely technical and organizational division. Moreover, he emphasized the risk of dehumanization that may result from monotonous work and performing simple and repeated actions (Czermachowicz & Marek, 2004). In his works, Smith presented issues related to the need for nourishment, periods of rest, occupational diseases, migration etc. in a way similar to contemporary views on these issues in the light of the theory of human capital.

Another great classical economist, D. Ricardo (1772–1823), presented one of the first models of economic growth. This model showed the influence of qualifications on the outcome of work, and presented the differences in the quality of work depending on the educational level of a worker. D. Ricardo, similar to A. Smith, perceived differences in the quality

of work assuming that skilled labour is a multiple of unskilled labour. He stressed the importance and role of knowledge and he saw it as a remedy for the faulty processes of the economic growth of that time. He claimed that countries where ignorance, idleness and barbarism cause deprivation and famine should be given a better government and more education and that would undoubtedly lead to an increase in capital higher than population growth (Ricardo, 1957). Contrary to A. Smith, D. Ricardo perceived education as an individual matter of each human being. He stressed the importance and role of knowledge and he considered it a panacea for faulty processes of economic growth of that time.

The issue of the importance of skills of workers and their influence on manufacturing processes was dealt with by numerous economists, such as: J. B. Say, J. S. Mill, H. Muller, and F. List. In their works, one can see the evolution of views on the economic role of the education of workers and skills acquired by them. When analysing the essence of production work, these economists considered the processes of education and scientific activity as direct factors contributing to an increase in the efficiency and output of human work.

J. B. Say (1767–1832) continued to develop the economic views of A. Smith. They both claimed that only some people have a well-developed talent for performing certain jobs, while they did not notice that each person has certain predispositions that should be identified and then developed through education. However, an important achievement of Say was the concept of separate roles of entrepreneurs, who organize production, and capitalists, who own capital. In this way, he emphasized the special role of the initiative, organizational abilities and other personality traits that are indispensable in business management. He was the first to evaluate human capital on the basis of the value of future income. He wrote that ‘a talent of an artist or a lawyer constitutes a part of their assets, but because it cannot be exchanged, it can be evaluated only on the basis of lifetime income derived from this talent’ (Say, 1960). He paid attention to the benefits of the division of labour and benefits derived from education. According to J. B. Say, human capital is created by means of different forms of education related to upbringing in a family, school education, work-based learning, and acquisition of skills. He considered education in terms of productivity and stressed that the acquired knowledge is the capital of a given person. Therefore, Say emphasized the impossibility of exchanging human capital contained in a human being.

Similar views on the role of education in production processes and economic growth were presented by J. S. Mill (1806–1873). He distinguished two constituents of human capital: human resources and skills, and classified them as national wealth and individual resources of a human being.

Therefore, although he separated human personality from his or her economic value, he believed that the value of a worker should be determined in terms of his or her knowledge and skills. J. S. Mill paid special attention to strong competition on the labour market. People with low qualifications have to settle for less stable and lower paid jobs in worse conditions, because workers with higher qualifications are more desired on the labour market. J. S. Mill differentiated the qualifications of workers and claimed that they depend on the duration and costs of education. He stressed that the remuneration of workers with higher qualifications should be higher. Similarly to D. Ricardo, J. S. Mill understood the social and economic benefits resulting from education, for example: a decrease in poverty, an increase in the level of intelligence, more opportunities to learn new types of work, better understanding of employers, a higher level of morality, honesty, culture, general knowledge, etc. Education, according to Mill, contributes to lower crime rate and, consequently, lower expenses incurred by the state on the judiciary and the police (Mill, 1965).

A. Muller (1779–1829), who criticised the classical economists, was strongly against describing national wealth only in terms of material objects. He believed that the idea of distinguishing only three factors contributing to economic growth, i.e. land, capital and labour, is incomplete and he added the fourth factor of ‘spiritual capital,’ which included, among others, knowledge, education, talents, culture, etc. This capital was supposed to include only exemplary goods of society and determine all economic growth, to become the most important factor in production. Therefore, work aimed at increasing the spiritual values has productive character and a person who works in the field of music, science or education is a production worker in the same way as a worker producing material goods in a factory (Spychalski, 1999). In conclusion, Muller believed that spiritual capital should be treated, on one hand, as the basic constituent of national wealth, and on the other hand, as a factor that influences the growth of national wealth.

Another pioneer who shaped the theory of human capital was F. List (1789–1846), a founder of the German school, who criticized the theory presented by A. Smith. In his works, he was against treating white-collar workers as non-production workers. Therefore, he emphasized the role of human knowledge and skills in the processes of economic growth and he regarded human knowledge and skills as the most important constituents of national productive forces. Such approach makes F. List one of the main pioneers of the theory of human capital (Miś, 2007).

Extensive studies on the role of the qualifications of labour force and knowledge in economic processes were also written by K. Marx (1818–1883). He stressed that the outcome of work depends on the qualifications and skills of workers. According to Marx, skilled labour is a multiple of

unskilled labour, because the acquisition of skills itself requires additional outlays. He believed that the material wealth of a society is determined by the productive forces that are developed by qualifications. The productive force is a combination of a human being and his or her productive capacity with means of labour. The main productive force is, therefore, a human being who possesses objectified knowledge. The basis for such reasoning was the determination of the concept of labour force by Marx, which was identified as the ability to work, which was viewed as the entirety of physical and spiritual abilities of a human body and personality, which are used by people in the process of production of any use-values (Marx, 1970). Furthermore, he recognized the need to incur expenses on the appropriate development of such skills. He created the concept of a constant, dynamic development of productive forces and suggested the need for changes in production methods in the conditions of the ever-changing, artificial natural environment.

K. Marx divided labour into two categories: productive and unproductive labour, and introduced the concept of a productive worker. According to Marx, productive labour aims at adapting the natural resources to human needs; it is performed within the material production and is equal to the labour of a worker. However, any work performed within the non-material production (education, culture, health care, science) constitutes unproductive labour. The concept of a productive worker was used for a worker who creates surplus value for a capitalist and thus increases the value of capital. The terms used by Marx for the elements of productive forces, the categories of the labour force and the general approval of human labour are connected to some extent with the contemporary understanding of human capital categories. Nevertheless, due to the discrepancies in the understanding of the basis of their value, they cannot be viewed as equal. Human capital performs work, whereas labour force, according to Marx, constitutes the source of work.

Views of Neoclassical Economists

Also other economists, such as A. Marshall, T. Veblen, and J. Keynes raised in their works the issue of the treatment of people in the context of capital; they pronounced their opinions on the subject of education and its role in the creation of national wealth. They claimed that the education of a society should be the highest priority of the state and not an individual matter of a human being. The cost of education should be incurred by the state and regarded as an investment in the economic growth (Wronowska, 2005).

A. Marshall (1842–1924) was a neoclassical economist who dealt with the issue of human capital to the greatest extent, including its development through investments in, among others, education. This author was

the first economist who differentiated between general education and specialised education. He defined general education as the knowledge and common sense required to perform in all professions, while he defined specialised skills as the ability to deal with materials and processes in a given profession. He supported the idea that education is an investment that will bring benefits in the future in the form of higher remuneration. He compared investments in human capital to investments in material capital, paying special attention to investments in the education and teaching of children. The issues related to the origins of the 'human capital' concept were further developed in his dissertations by increasing the number of production factors. He added the factor of entrepreneurship and organization to the traditional division of labour, capital, and land. He stressed that profits of an enterprise are determined by the division of production tasks, technological progress, and the skills of managerial staff, whereas production costs also include payments related to traditional factors. He believed that an entrepreneur, who organizes production in a certain way, is the basic element of business practices and economic theory. He believed that the elimination of poverty is the main task of the economy. Marshall's considerations included numerous ideas that inspired future scholars dealing with human capital. Although he did not attempt to determine the capital value of a human being, he tried to prove that capital invested in people is the most effective of all (Miś, 2007).

In America, the problem of the role of knowledge in socio-economic life was raised by T. Veblen (1857–1929), who is considered a pioneer of institutionalism. Veblen referred to permanent behavioural traits as instincts. He claimed that human actions are driven by three main instincts: parental bent with regard to the closest family and members of the family community, workmanship, and idle curiosity pushing a man to learn about the surrounding world (Stankiewicz, 2007). Parental bent implies taking care of one's family, class and nation. Economy is influenced mainly by the instinct of workmanship, which makes people produce goods of high quality and strive for high efficiency and effective organization of work, which is reflected in the production output. Disinterested, idle curiosity makes people ask questions and search for the explanation of phenomena of the surrounding world, which constitutes the basis for the development of scientific knowledge and technology.

The views presented above were shared by the originator of the theoretical basis of state interventionism – J. M. Keynes (1883–1946). His views were presented in two ways: the first one – in the form of quantitative economy that was reflected in the models of economic growth, and the second one – as the theory of state interventionism in the economy. In terms of economic models, he frequently took resources of the labour force as vari-

ables, that is its: quantity, skills, the current level of technology, knowledge, and science (Wojtyna, 2000).

The issue of the labour force, its education and qualifications, did not receive its due share of attention until the Second World War. It was not until the middle of the 20th century that a sharp technological growth forced an increase in the level of qualifications of the labour force, while education and acquisition of knowledge became one of the basic factors contributing to the economic growth of countries. The issue of qualifications and knowledge affiliated with a broadly understood labour market was so popular among the economists at that time that a new scientific discipline was created – ‘the economics of education.’ It dealt with regularities and relations between outlays and effects of teaching, which made it possible to determine the influence of qualifications on the economic growth.

During the transition of modern economic thought into contemporary economic thought, the group of economists that dealt with the issue in question included three important authors: I. Fisher, J. A. Schumpeter, and S. G. Strumilin.

I. Fisher (1867–1947), the co-originator of the quantity theory of money, claimed that investments in professional education of a worker increase his or her future income. In the light of the foregoing, a production factor called labour can be regarded as capital generating a certain percentage of profits. This percentage rate should constitute the basis for discounting the income stream in order to make it equal with the costs of education. Fisher came to the conclusion that by means of the percentage understood in this way, one can measure the price that individuals are willing to pay in order to acquire income on an on-going basis, not in the future. The view presented above does not clearly indicate, however, whether Fisher considers as capital only the acquired skills, knowledge, and abilities added to people or people themselves with their qualifications, knowledge, and innovativeness, as well as the ability to use them. He presented these issues in a way, which invites different interpretations (Domański, 1993).

The issue of the role of knowledge in the processes of economic growth was also raised by J. A. Schumpeter (1883–1950), who is regarded as one of the most prominent intellectuals of the 20th century. He emphasized the influence of human enterprise on economic growth; furthermore, he paid attention to the creation of such work conditions for the workers that would be conducive to the development and manifestation of their enterprising qualities and this, in turn, would provide the company with committed, efficient, and innovative human capital (Czermachowicz & Marek, 2004, p. 23). Schumpeter did not define the concept of capital, but he thought that entrepreneurs play a key role in making economic growth highly dynamic. In his dissertations, he presented his vision of a society where inventions and

innovations, and technological progress, constitute a driving force for any progress.

The first attempts to perform an economic evaluation of the effectiveness of education were made by S. G. Strumilin (1877–1974), a Soviet economist of Polish descent. The starting point for this analysis of the effectiveness of expenses incurred on education was the comparison of remuneration and work efficiency of selected workers and clerks with the level of their education. The results of this research proved that obtaining the primary education by illiterate workers increased their work efficiency on average by 30 percent, whereas training unskilled workers in preparation for a profession increased their production capacity on average by 12–16 percent annually. Strumilin claimed that one year of learning increased qualifications 2.5 times more than one year of professional practice. On this basis, he proposed an increase in state funding to develop the primary education system, which would lead to an over-proportional increase in national income (Miś, 2007). The basic mistake of his analyses was the assumption that only qualifications have an influence on the level of work efficiency. He failed to take into consideration the impact of technological progress on work efficiency. The second flaw in his reasoning was not taking into account the source of financing for the education system and the development of professional qualifications, which are expenses incurred on educating individual persons. Nevertheless, this does not belittle the importance of his research, which constituted the basis for numerous future works devoted to the economic effectiveness of education.

Creation and Development of the Theory of Human Capital

The foundations of the theory of human capital were being created for many centuries by representatives of various economic theories in many countries. It was not until the 1960s that the theory of human capital was created. The foundations of this theory were built by: Theodore William Schultz, Gary Becker, and Jacob Mincer. The originators of the theory of human capital referred to the theory of capital created by I. Fisher, who claimed that all resources can be regarded as capital if they are used by a company. According to this view, the category of capital can also include human beings, and their skills, knowledge, and vital forces can be regarded as resources that constitute the source of services in the form of future satisfaction or salaries (Kunasz, 2010).

T. W. Schultz believed that human capital consists of human knowledge and skills, and he stressed that individuals make conscious investments in themselves in order to increase the acquired income and own welfare. In this way, he focused his attention on the socio-economic results of such investments and proposed a theory that faster growth of national income

in comparison with the expenditure of work, land and tangible assets has its source in the increased educational level of workers. T. W. Schultz believed that each individual is equipped with specific knowledge, abilities, and qualifications that may be regarded as factors of production. Certain aspects of motivation, behaviour, physical qualities, and mental health of individuals may also be perceived as human capital. Furthermore, apart from the broadly understood education, he identified other activities that may improve the quality of human capital, among others, health care and migration of workers within the labour market. According to the author, the value of human capital is decreased if it is not used in a proper way – such situation can be caused by unemployment or low wages (Schultz, 1963).

Another economist, G. S. Becker, analysed the issue of investment in education and related costs and effects with reference to unemployment. He understood investment in human capital as the allocation of resources that influences real future income. In the basic types of investments he included the expenses on health care that increase longevity and improve health, education within the education system, training for a profession and traineeship in companies, expenses related to human migration in order to adapt to new employment conditions, expenses on obtaining career information, expenses on scientific research (Becker, 1975).

Roughly at the same time, an American economist of Polish descent, Jacob Mincer (1922–2006), started working on a similar subject. Mincer introduced the concept of investment in human capital understood as the process of learning, first at school and later through work experience. He understood human capital as the sum of knowledge acquired at school and then at work. That is why the value of human capital can be determined by the duration of formal education and age, which reflects the experience of individuals (Mincer, 1974).

The influence of education and learning on the value of human capital and the amount of remuneration was one of the basic issues raised during the creation of human capital models. Education was regarded as investment by J. R. Walsh. He examined school education of a certain type, namely that preparing for a professional career, and he paid attention to the correlation between the duration of learning, the level of exclusivity of a given profession, and the probability that the decision to continue education will be based on the possibility that it will bring profits that will exceed costs incurred on education (Spsychalski, 1999).

It is also worth paying attention to the works of other economists, which were written in the 1960s. For instance, an American economist B. A. Weisbrod claimed that investment in people makes it possible to take advantage of the technological progress and enables further progress. Investing in both physical capital and human capital, which includes, according to

Weisbrod, Schults and Becker, health and education, contributes to the economic growth (Weisbrod, 1962).

The theory of human capital is one of the basic theories explaining the phenomena and processes related to the use of labour resources in the economy. It is based on a neoclassical paradigm, but, at the same time, it changes its premises. The foundations of this theory were created in the 1960s, and then the theory was developed and prepared in its entirety by G. Becker in 1990. He understood human capital as 'knowledge' contained in people, and a higher level of human capital accelerates its further accumulation. He placed the investment in human capital in the middle of his model of economic growth (Becker, 1992).

The theory of human capital was criticized, in particular the views of T. W. Schultz, who proposed education only to be treated in the context of investments. This author omitted many other important reasons that motivate individuals to professional self-development related to: the feeling of pleasure and satisfaction connected with the acquisition of knowledge, accomplishment of goals and development of personality. Furthermore, one should remember that at the time of making a decision to study, employees never have full information concerning the situation of the labour market, so they may not have any material benefits from their education in the future and this is contrary to the assumptions of the concept of human capital. Nowadays, also the view of G. B. Becker is deemed to be contrary to the human nature, as according to his concept, human behaviour is always aimed at the maximization of effects and human beings can always define their preferences, which do not change with time.

Despite the criticism, the theory of human capital is thought to be important, especially due to its new approach to employees and their work, as well as rules of the operation of the labour market. It is worth noting that the concept of human capital is used at least on three levels: at a macro, micro (organization) and personal level.

While examining human capital at a macro level, one may assume that it is the stock of knowledge, skills, health, and vital energy in a given society/nation. Human capital constitutes a resource, which is a source of future satisfaction and income, or, on the whole, services of certain value (Domański, 1998). This approach emphasizes that human capital exerts great influence on the innovation of economy and society, and hence the ability to adopt and implement global accomplishments related to science and world-view. Furthermore, it influences institutional transformations, is conducive to the propagation and dissemination of modern patterns of consumption, and shapes modern technological, organizational, information, social and other types of infrastructure (Makowski, 2002). Therefore, investments in human capital have positive effects on both individuals and

society as a whole. Benefits can be seen as an increased output and economic growth, but they may also be connected to non-economic benefits, such as higher social cohesion, lower crime rate, better condition of health of society, etc.

On an organizational level, human capital is closely associated with the category of intellectual capital, although different authors interpret it in many ways. Intellectual capital denotes non-material resources and a transfer of knowledge available within an organization (Armstrong & Baron, 2008). The category of intellectual capital includes human capital, social capital, and organizational capital. Human capital includes knowledge, skills, opportunities, and the potential for development and innovations represented by the employees of a given company. By investing in themselves, people can increase the number of choices available to them. Social capital concerns the structures, networks of interpersonal contacts, and procedures that allow the employees to acquire and develop intellectual capital in the form of knowledge gained by interpersonal relations. The concept of organizational capital includes institutional knowledge that constitutes the property of particular organizations and is contained in databases, procedures, regulations, etc. (Edvison & Malone, 1997).

When analysing the human capital of an organization one should also pay attention to its two aspects: its quality and quantity. From a qualitative, structural point of view, human capital denotes the system of mutually related elements that determine the uniqueness and exceptional character of human resources in a given organization. This approach emphasizes that the condition of the human capital of a company is determined not only by adequate qualifications, but also by personality traits, openness to change, creativity and enterprise of employees. Because the concept of human capital is based on the assumption that a human being learns throughout his or her entire life, members of an organization should be regarded as resources in which one can and should invest. A quantitative, financial perspective reflects the aspect of costs related to the development of human capital and hence the capitalization of expenditures and efficiency (Tyrąńska & Walas-Trębacz, 2005). In this sense, human capital is closely related to the accumulated value of investments in employee training, competencies and their future; it is focused on the value of what a given person can produce (the value of a person in the economic sense). Therefore, efficient management of human resources in an organization requires the determination of measures of human capital. The most frequent measures include the record of absences from work, the record of accidents at work, the cost of training and educational projects, the staff turnover rate, personnel costs and results of customer satisfaction surveys (Czerna-Grygiel, 2008, p. 246).

The third level, at which one can examine human capital, relates to indi-

vidual human beings. At an individual level, the constituents of human capital are defined in different ways, because the literature does not reflect a single, common stance on the subject. M. Blaug mentions six components, which form human capital of an individual: formal education, experience in a given profession, job seeking, reconstruction of information, migration, and health condition (Blaug, 1976). H. Król offers another idea and claims that individual human capital is the sum of specific qualities and traits embodied in a human being (knowledge, skills, abilities, health, motivation), which have a certain value and constitute the source of future income (Król, 2006).

Despite the fact there are no clear-cut and precise definitions, the author assumes that human capital comprises competencies of workers (including skills and know-how), attitudes of employees (motivation, leadership skills of managers) and the intellectual abilities of people (innovation, enterprise, capability of adaptation and learning).

When analysing the concept of human capital at all three levels, the importance of an effective education system and the acquisition of skills by means of formal education and experience is emphasized. Therefore, the development of human capital is regarded as an important investment in the development of society that contributes to an increase in the competitiveness of the economy. Nowadays, the rules of human capital development in a modern enterprise are determined by the concept of knowledge management. It was A. Marshall, one of the originators of the neoclassical theory of economy, who observed that: 'capital consists in knowledge and organization to a large extent' (Stankiewicz, 2007). Within the management science, knowledge management is a new trend that is connected with the theory of human capital.

Human Capital as a Strategic Resource in the Knowledge-Based Economy

From the perspective of the theory of economic growth, the concept of knowledge is extremely extensive. It comprises a continuous set of different types of knowledge, from highly abstract knowledge in the form of theorems, theories, etc., to directly useful knowledge in the form, for instance, skills related to the operation of a telephone. Between these two extremes, there is knowledge somewhere in-between, for instance the production technology of telephones, ideas for a new film screenplay, new formula of a medication, etc.

J. Liebowitz and T. Beckman propose another type of knowledge – constructive knowledge. Their classification of knowledge is based on two criteria related to the possibility of accessing and storing knowledge. Available knowledge is stored in computer systems. Tacit knowledge is in a human

brain and access to it is particularly difficult. Constructive knowledge is also located in a human brain and documents, and it is possible to access to it by means of questions and discussions. In this case, an important role is played by an informal communication system, because it gives an opportunity to share this knowledge (Liebowitz & Beckman, 1998).

The importance of this knowledge results from the contemporary paradigm of economic development based on the following three elements: globalization, competitiveness, innovation. Knowledge constitutes a source of innovations and determines the intensity of their use in practice by means of appropriate information technologies. Furthermore, it has a significant impact on the competitive advantage. Consequently, the concept of knowledge-based economy has been created with reference to modern economy, which is sometimes referred to as the knowledge-driven economy in order to stress the role of knowledge (Grzelak & Olechnicka, 2003).

The creation of KBE requires the recognition of knowledge as a separate factor of production. Both the creation of knowledge itself (within the R&D sector) and its diffusion by means of technologically advanced added value within GDP requires the redefinition of the conventional human labour. It means the creation of a new category of human capital; this capital is indispensable for the creation of a new quality in the R&D sector and in other branches of modern economies.

Human capital is a specific category and has special attributes. Firstly, ownership rights with regard to human capital are different than ownership rights with regard to physical capital. It results from the essence of human capital that is embodied in a particular human being, who has the right to liberty. Consequently, the so-called knowledge workers have the right to make decisions about their career and choose types of investments to match their individual talents, energy and time. Because human capital constitutes an integral part of a human being – a worker, it does not belong to a company, but it is only lent by a worker. It is the only factor of production that can increase its value and contribute to a decrease or an increase in the value of other types of capital of an enterprise. According to this view, it is the most important and, at the same time, the least durable category of intellectual capital (Table 1).

Another characteristic of human capital is connected to the idea of treating it as an asset and not only a cost. It results from the efficiency potential of human capital, which implies profitability of an investment in this kind of capital. An investment in human capital also incurs some costs, such as: financial expenses (direct and indirect expenses in the form of costs of alternative financial capital used for investments in human capital), psychological costs (related to difficulties in the assimilation of knowledge), social costs (related to costs of alternative time invested in human capital).

Table 1 Constituents of Intellectual Capital

Human capital	Organizational capital	Market capital	Innovation capital
Competencies	Processes	Relationship	Process
Attitudes	Infrastructure	with clients	improvement
Leadership and development	Culture	Relationship	Products and services
	Management	with suppliers	Technologies
		Market skills	
		Other relationships	

Notes Adapted from Kasiewicz, Rogowski, and Kicińska (2006).

The results of investment in human capital are qualifications – a new quality of a given person, which allows him or her to create an added value of a new quality. An employer investing in human capital obtains an increase in the level of innovation and efficiency. Furthermore, human capital is the source of competitive advantage, if the competition is not able to substitute or imitate human resources representing human capital of a certain quality. The competencies of human capital have to be efficient from the point of view of GDP, which determines the economic profitability of investment in human capital. Nevertheless, it is difficult to predict which areas of human capital will be profitable, for example, in 20 years' time. However, one may generally assume that an increase in the quality of human capital leads to an increase in intelligence, which is viewed as the ability to communicate with the surroundings and adapt to problems that arise. Therefore, investments in human capital decrease the scope and level of risk and may improve the perception of safety the individuals possess.

One should stress that human capital is a dynamic asset that is subject to different conditions related to, among others, the loss of value due to accidents (death, qualification for disability pension at a young age) and depreciation (influence of health on the quality of human capital).

Furthermore, the implementation and activity of human capital occur in the complex network of social relations. It could be said that economic growth based on human capital depends on the level of social capital (Dokurno, 2009).

It is worth mentioning that human capital is subject to the process of depreciation, because some skills deteriorate with age and disappear completely when not used. Therefore, the category of human capital cannot be regarded as a homogeneous and constant set of skills and competencies (Giegiel & Wildowicz, 2007).

Research concerning the creation of value added to an organization by human capital showed that companies, which manage human capital in an effective way, can overtake their competition by up to 43 percent (assuming the market value as the reference point rather than the book value). Nowadays, the value of an enterprise is determined mainly by the human factor, so the planning of personnel professional development and investing in the

development of certain skills of employees should be of overriding importance (Jurczak, 2006). According to this view, human capital management in organizations takes advantage of many innovative concepts of management, such as knowledge management, skills management or intellectual capital management.

Knowledge Management

Works of futurists and authorities in the field of management have become the source of inspiration and interest in the issue of knowledge. Peter Drucker, in his works written in the 1980s and 1990s (Drucker, 1993), popularized such concepts as the knowledge-based economy, knowledge-based leadership, and knowledge as the most important and unique resource. A similar role can be ascribed to works of Alvin Toffler (1985) and John Naisbitt (1997).

The concept of knowledge management is thought to have begun in 1987, whereas its development falls to the second half of the 1990s when the concept was popularized by Ikujiro Nonaka from Japan, who in 1995 published a book together with Hirotaka Takeuchi entitled *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Views on the subject of the meaning and importance of human capital as the capital of tacit knowledge, and on the ways of solving problems related to its effective use in a company have been evolving. There have been many models and approaches to knowledge management, but three of them can be recognized as the leading trends in this field: Japanese model, resource model and process model.

The Japanese model of knowledge management is the result of the research conducted by two Japanese men mentioned above, Nonaka and Takeuchi, who created the model of 'the spiral of knowledge' at the beginning of the 1990s, which was later developed into the systemic approach to knowledge management (Nonaka & Takeuchi, 1995). The starting point for the creation of the Japanese model of knowledge management was the distinction between two types of knowledge – tacit (implicit) knowledge and explicit knowledge, assuming that tacit knowledge is more important and hence it should be used by an entire organization. In order to do that, it is necessary to use suitable information technologies. According to the Japanese model, the transformation of tacit knowledge, which is unattainable, into knowledge that can be perceived and acquired by other members of an organization constitutes the process of knowledge creation – in this way knowledge in organizations is created. Their approach is of systemic nature, but in the subject literature it is often simplified and reduced to the process of knowledge creation.

The resource model of management was developed in the first half of the 1990s as a result of research on the innovation of industrial companies.

It was based mainly on the concepts of D. Leonard-Barton from Harvard Business School and her model of the 'wellsprings of knowledge' based on the concept of key competencies and skills (Leonard-Barton, 1995). The resource model of knowledge management is based on the resource approach that has been developed for a long time within strategic management. According to this approach, knowledge is the most important resource of companies. A company itself or its surroundings can constitute a source of knowledge. The resource model of knowledge management concerns the present and future time, as well as internal affairs of the company and its surroundings. This model is not very innovative, but it refers to the traditional way of thinking developed on the basis of strategic management.

The process model, contrary to the two models presented above, is based on solutions and practical experience of large consulting companies. Davenport and Prusak (2000, pp. 36–45), Probst, Raub, and Romhardt (2002), as well as Bukowitz and Wilson (2000) have contributed greatly to the development of the concept of the process model, because they made a synthesis of the existing practical experience. According to the process model, knowledge management consists of all processes that enable creation, dissemination, and exploitation of knowledge for the purposes of an organization.

The concept of knowledge management is related to the concept of intellectual capital. Intellectual capital is defined in many ways. It can be understood as all assets derived from the knowledge of a company, as the result of the process of knowledge transformation, or as knowledge itself.

Edvinson defines intellectual capital in a similar way – it consists of knowledge, practical experience, technologies, and good relationships with clients of a company (Edvinson and Malone, 1997). Karl-Erik Sveiby (1997) thinks that the main difference between intellectual capital and knowledge management is the fact that intellectual capital is a static concept, whereas knowledge management is dynamic and constitutes the art of creation of wealth out of intangible assets of an organization.

Nowadays, both concepts knowledge management and intellectual capital have many advocates and popularisers. While knowledge management is focused on the management of activities related to the creation, transfer and exploitation of knowledge, the management of intellectual capital is focused on the registration, visualization, measurement and development of intellectual resources from the point of view of a company's strategy.

Paradigm of Information Technology

Knowledge management is not possible without certain changes introduced to information and communication systems. The development of computer networks that enable their users to access data, have a conversation or

discussion, as well as special databases and expert systems constitute an integral part of knowledge management in a company. For many years it has been considered to be closely connected with the development of modern computer tools and their common application.

Modern society is described as the information society. It is thought that information, which constitutes the basis of an activity, plays a key role in this society. This society is characterized by socio-economic relations in which particular entities and individuals have free access to a lot of information and tools used for its analysis. Organizations are able and, at the same time, possess opportunities enabling them to share knowledge, which, consequently, should lead to the creation of values that are conducive to development (Hales, 2008).

New paradigms of management pronounced by Drucker in 1999 highlight a very important role professional computer tools have in management (Drucker, 1999). The paradigm of information technology constitutes the basis of the information society. According to the new paradigm, management has to be focused on the psychological aspect, commitment of employees, subjectivity, trust, participation, and team work. Furthermore, technology should use cheap information inputs that result from the progress in the field of microelectronics and communication technology. This paradigm is based on the rules related to the generation of information borrowed from natural sciences, which also appear in other fields of technology (Castells, 2007). M. Castells mentions five key characteristics of the paradigm of information technology. Information, which constitutes the basis of the technology, plays a key role in the paradigm. The second characteristic is linked to the ever-present influence of new technologies, because information constitutes an integral part of each area of human activity. The third characteristic of the paradigm constitutes a network logic of each area (system, set of relations), where new information technologies are used. Because of the complexity of the network, it can operate in an effective way only as a complete unit consisting of many different elements. Owing to information technology, it is possible to use networks in all kinds of processes and organizations. The development of the network grants more benefits to its users due to a higher number of connections. Flexibility is another characteristic of the paradigm in question. The reversibility of processes, their modifications and sometimes even a radical change in the configuration of systems are the answer to constant changes in the field. The last and fifth characteristic is the connection of particular technologies into a highly integrated system. Separate technological procedures that have existed until now are becoming more and more similar to each other. Particular specializations within a single industry are becoming interdependent and integrated with one another. It is the consequence of the complexity of technological sys-

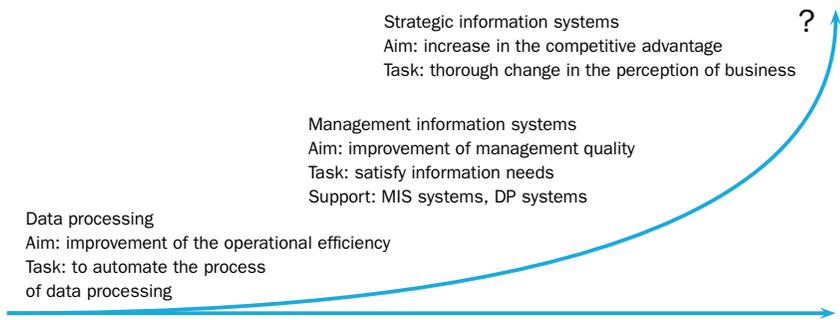


Figure 2 The Model of Evolution of Information System (adapted from Curry, Flett, & Hollingsworth, 2009)

tems in which one element does not operate properly without the remaining elements (Castells, 2007).

An increase in the importance of knowledge leads to the ‘dematerialisation’ of processes and intellectualisation of business entities. It requires new solutions in the field of technology that will enable the creation, exploitation, and diffusion of knowledge. Solutions that have been used until now make it impossible to use the results of the dynamic growth of science, technology and management, as well as certain skills and competencies in an effective way (Grudzewski & Hejduk, 2008). The evolution of the information system to date is shown in Figure 2.

Nowadays, we are still at an early stage in the development of knowledge-based organizations, in which the role of information systems consists of:

1. Improvement and coordination of internal processes
2. Connecting organizations with suppliers and clients
3. Manufacturing of products preferred by customers
4. Providing managers with data and information

Figure 2 shows that organizations still have a lot of work to do in order to be highly flexible, act quickly and gain a competitive edge based on the creation of knowledge. We will have to wait some time until solutions developed by scholars and theorists will be supported by practitioners and until managers and workers will be ready to change the economic reality.

Conclusions

The issue of the place of a homo economicus in economic processes is still present and it has been established during the historical development of economic thought. Nevertheless, in classical works it was only mentioned during the presentations of views related to leading trends. In the 1960s, some revolutionary changes occurred in this area – the perspective

has changed. Thanks to the works by Becker, Schultz and Mincer, activities regarded until that time as consumption and the source of costs (e.g. personnel costs) started to be seen in a new light, because they examined the issue of benefits and thus profitability of these activities, which have been regarded as investment in human capital since then. These authors were the pioneers of the modern concept of human capital.

The theory of human capital is still being developed in social sciences. The development and dissemination of the theory of human capital had a considerable influence on many other fields, especially in the area of economics, but also management – such as the theory of intellectual capital and knowledge management.

Nowadays, management is based on knowledge that is a new category among the factors of production. Human capital is thought to be of key importance in the process of knowledge accumulation. In this case, this variable is not limited to manual labour as was the case in the classical economy. Human capital includes knowledge, skills, opportunities and the potential for development and innovations represented by employees of a given organization. By investing in themselves, people can increase the number of available choices. Skills are influenced by genetic factors, but they also depend on the process of knowledge accumulation in the process of a broadly understood education of an individual. In the time of knowledge-based economy, human capital is becoming the main catalyst for development at a macro level, but also at a micro level, and, at the same time, one should not forget about the individual level of human capital.

In conclusion, the evolution in the approach to human capital, from human capital management to the management of tacit (implicit) knowledge resources in organizations results from changes in the understanding of the role of a human being and his/her work in an organization – starting from when he/she was first treated equally to other factors of production, until now, when he/she is considered to have a decisive role in the process of work, and who is capable of developing his/her individual potential, skills, qualifications and knowledge by performing tasks in a responsible and independent way.

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