

Specificity of Knowledge Management in the Enterprise in Dependence on the Stage of the Person's Life Cycle

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Abstract The country's achievement of the state of the knowledge economy is determined by the effectiveness of knowledge management processes, which on the other hand has a decisive for ensuring the competitiveness and enterprises' financial and economic success of any field of activity and ownership. The main carrier of knowledge is a person who during life gradually passes through various stages of the life cycle and development, each of which has its own peculiarities of their accumulation and using. The activation of these processes for Ukraine is of paramount importance because of the rather high human potential and the unsatisfactory level of its use—in recent years because of the sociopolitical crisis has a negative trend of change. The research is characterized by patterns of accumulation of knowledge during a person's life with the concretization at each stage of the probable correlation of the volumes of knowledge, the main factors of their acquisition or the preservation of the directions for their change. The concrete strategic decisions that should be adopted at the enterprise with the purpose of activating the processes of knowledge management taking into account the formulated regularities were justified. Orientation of the company's management to the maximum coverage of all stages of the life cycle of a person is the basis for attracting or education talents and creating an innovative leap on this basis.

Keywords Knowledge management · Enterprise · Staff · Person · Stage of human life cycle · Age · Professional development · Knowledge economy · Human capital

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Introduction

The valuable asset of any enterprise is its staff. The professional knowledge, skills, and abilities of employees that make up human capital form the overwhelming majority of the enterprise's market value and ensure its progressive and competitive development for the long term. At the same time, the achievement of these attractive trends is possible, among other things, because of subject to the fulfillment of three basic requirements.

Firstly, the staff of the enterprise should be staffed with highly professional and highly experienced specialists, whose average age should not exceed 35–40 years; and for this, it is necessary to achieve the optimal relationship between the processes of continuity and rejuvenation of staff. Secondly, favorable conditions should be provided for the creation and further cultivation of workers' internal need for their own professional and personal development on a continuous basis.

Thirdly, an effective system of continuous and uninterrupted productive transformation of implicit knowledge of employees into explicit ones should be developed and implemented, while simultaneously generating, acquiring, and disseminating the newest innovative professional knowledge, the most complete mastering of which is capable of raising the technical and technological level of the enterprise and the quality of its overall management on the latest frontiers.

The crisis phenomena aggravated in the Ukrainian economy over the past 5 years have led to the fact that the state of the Ukrainian labor market can only be assessed as unsatisfactory due to the presence of such “diseases” as high unemployment, excessive level of youth unemployment, imbalance between demand and the supply of labor, the high level of shadowing of labor and wages, the fall in real wages, the poverty of the working population, etc. So, according to the official statistical reporting of Ukraine (State) in 2016, the unemployment rate according to the ILO methodology was 9.3%, the average annual load of registered unemployed per 10 vacant jobs (vacant posts) was 94 people, and the proportion of unemployed people—only 32.2%. In 2016, 23.0% of the economically active population aged 15–24 did not work, which is quite a critical level compared to 12.8% of the world's average. The level of the shadow economy in 2016 was 34.0% of official GDP, and informal employment reached 24.3%. The share of the population with incomes below the subsistence minimum was 3.4%, while real wages fell by 20.2% compared to the previous year. At the same time, most of the above indicators had a stable negative dynamics over the past 10 years.

The aggravation of these problems on the Ukrainian labor market reduces the possibilities for full compliance with the three basic requirements mentioned above. Thus, the full implementation of *the first requirement* is hampered by high unemployment and an annual reduction in the number of jobs, as over the past 10 years, the number of industrial enterprises has decreased by 20.0% (State Statistics Service of Ukraine, 2018). Because of this reason, the opportunities for employment in the specialty of university graduates are greatly reduced—on average over the last 10 years annually, only 25.3% of graduates receive the first job (State Statistics Service of Ukraine, 2018). That means that the access of young skilled workers to the real sector of the economy is rather limited, which reduces the opportunities for rejuvenating the personnel of enterprises and increasing the level of innovation in their activities (in 2016 the share of realized innovative products in the total volume of sold industrial output was only 1.4% against 3.8% in 2010) (State Statistics Service of Ukraine, 2018). As a result, in 2016, the average age of the employed female

population was 41.3 years, and the male age was 39.8 years (calculated by the author according to the State Statistics Service of Ukraine, 2018).

The barrier for *the second* requirement is the low level of payment and unsatisfactory working conditions created at most industrial enterprises. According to the “Regulations on Professional Training of Personnel at Work” in Ukraine, every employee of industrial enterprises must undergo an increase in professional skill at least once every 5 years; however, due to the lack of sufficient funds from employers, this norm is not met. Thus, the average time that passes between the procedures for upgrading the qualifications of employees of Ukrainian enterprises is 11.1 years (calculated by the author according to the State Statistics Service of Ukraine, 2018).

The analysis allows us to state that the difficulties in fulfilling the first two conditions for the Ukrainian economy are exclusively due to the crisis phenomena that are observed in the economy and in social and labor sphere; the weakening of the negative influence will allow us to fulfill these conditions. At the same time, there are many well-developed, well-founded and tested methods and instruments, regulatory legal acts, and regulatory documents to implement the first two conditions. But, the practical implementation of *the third condition* for Ukraine is a rather complex issue due to the shallow level of scientific and practical elaboration of this problem and the complete absence of an effective scientifically grounded mechanism of knowledge management at the individual and collective levels. Under such circumstances, if all other things being equal that means Ukraine’s achievement of the state of the knowledge economy is a practically impossible task in the next 3 to 5 years, so any attempts to develop a theory of knowledge management aimed at providing a specific Ukrainian enterprise with an effective tool for accumulating and using knowledge, adapted to the current conditions of its functioning, is a very urgent task of the day can be considered one of the effective tools for the withdrawal of the country’s economy from the crisis and the beginning of the tendencies of its recovery.

Analysis of Research and Publications in the Field of Knowledge Management

The issue of knowledge management *towards the practical implementation of the third requirement* is very widespread today in the research of world scientists. The review is carried out both under the angle of national policy and in terms of managing the main production link of the state enterprise. At the same time, the fundamental and already established view that modern competitive advantages are based not on goods but on the latest knowledge and information (Giju et al. 2010; Sedziuviene and Vveinhardt 2010; Olkiewicz 2015). The main goal of knowledge management as a key business process aimed at achieving wisdom is the creation of values, the improvement of competences, and the accumulation of knowledge that must be constantly used to increase efficiency, the growth of the enterprise’s value in the market, and the practical implementation of the purpose of its existence (Abu Zar Wajidi and Asim 2009; Trinkuniene and Trinkunas 2014; Brockmann and Roztocki 2015). Therefore, the necessity for knowledge management is related to the enterprise’s striving for organizational survival in a highly competitive environment, the negative impact of the effects of globalization, and the aging of the workforce (Olkiewicz 2015).

Krstić and Petrović (2012) emphasize on the high rate of depreciation of the knowledge of the enterprise increasing competition in the market, and therefore the main task of the knowledge management system should prevent the loss of skills and core competencies of the enterprise, which is necessary for the accumulation of new knowledge. At the same time, the authors determine that the mandatory tools for knowledge management should be the motivation for the accumulation of knowledge and their exchange through internal and external communications. According to Goodman (2014), the importance of knowledge management grows in proportion to the size of the company: under existing business conditions in large companies, it is difficult to create a universal central knowledge repository, the use of which would prevent ineffective funding of knowledge that already exists and replicating former managerial errors and to increase the usefulness of the available knowledge. That is why there is an urgent need for companies to invest in the creation and support of a special knowledge management platform capable of timely providing all interested internal and external stakeholders with exhaustive information in the most convenient form for use (Kumar 2014; Omotayo 2015). To create such, a platform should be involved specialists of different profile, and first of all, engineers and IT specialists who can use technical and information innovations for high-quality, safe, and effective knowledge management (Abu Zar Wajidi and Asim 2009; Krstić and Petrović 2012).

Kahre (2011) notes that it is imperative not only to create a knowledge repository to manage the enterprise's knowledge but also to introduce permanent procedures for the administration and modeling of strategic knowledge and the continuous accumulation of knowledge. The success of the functioning of this repository and the procedures for its administration directly depends on the possibility of creating at the enterprise an organizational culture oriented towards knowledge, the basis of which is the introduction of innovations into the sphere of exploitation and accumulation of special knowledge (Gonzalez and Martins 2014).

Organizational culture must be capable of constant adaptation to the external environment, and therefore should be based on a strategic vision of the organization, innovation, creativity, support of internal communications, and continuous development of workers (Sedziuviene and Vveinhardt 2010; Dincă 2013; Bitkowska 2016). In these conditions, when forming a knowledge management strategy, it should be carried out its mandatory centering on a person with his unique knowledge, skills, and skills and culture.

Sufficient scientific research in the field of knowledge management is devoted to the disclosure of the specificity of knowledge accumulation at different stages of human life and the cyclical nature of enterprise development. So, Audretsch and Feldman (1996) empirically proved that the propensity to activate innovation and the possibility of achieving the effectiveness of the process of knowledge accumulation depend on the stage of the life cycle of the industry and the geographical location of the enterprise. At the same time, the knowledge management procedure at the enterprise level is also subject to a certain cyclicity, whose effectiveness is influenced by the degree of novelty, dependence, and specialization of information, and gradually passes through various phases and turns into knowledge (Carlile and Reberntsch 2003). However, on the way to an effective knowledge management process, there must be the mechanism for implementing their basic procedures (transfer, exchange, use, access, dissemination, implementation, etc.) and direct management models at different stages of a person's

life (Graham et al. 2006; Di Nauta et al. 2015). Rowley (2001) reveals the relationship between learning and management of all types of knowledge, and justifies the advisability of introducing a process of human learning throughout his life. By the definition of Saviano and Caputo (2013), namely the orientation towards these approaches at the level of the enterprise, industry and the economy of the country as a whole will allow us changing the thinking and the level of effectiveness of management decisions, ensuring the viability of each system.

Modern research proves the importance of using such effective instruments of accumulation and dissemination of the latest knowledge in the enterprise as information and communication technologies, cloud computing and large data sets (Caputo et al. 2017). It is very important to establish all the factors that have a positive or negative impact on the exchange of information and knowledge in the knowledge society, to determine regularities and to develop on this basis measures that increase the rate of knowledge accumulation at all levels of government and at all stages of human life (Caputo 2017).

At the same time, despite the numerous and diverse fundamental researches on this issue, the final acceptance by the company management of a strategic decision to focus on comprehensive knowledge management, in accordance with *the third requirement*, will be based solely on a clear understanding of the degree of economic recovery and the financial feasibility of this process.

In this regard, the importance of research on the dependence of the level of economic and financial performance of the enterprise on the intensity and rationality of the introduced knowledge management processes becomes rather value. Such studies exist and are quite common. Thus, the scientists have reasonably proved the positive influence of the knowledge management process on the tendency of increasing sales of goods, increasing the speed of innovation processes, increasing the level of labor productivity, improving the organizational culture and, thereby achieving the efficiency of the enterprise (McKeen et al. 2006; Laia and Lin 2012; Nawaz et al. 2014; Valdez-Juárez et al. 2016; Torabia et al. 2016). Deeper researches have made it possible to establish a high level of influence of knowledge management procedures on the financial performance of the enterprise (Vidović 2010). According to the author's estimates, such aspects of the general knowledge management process as «knowledge of culture» and «measurements of knowledge management» have the greatest impact on financial indicators.

Consequently, we can conclude that the modern world science in the field of knowledge management has formed a wide range of issues critical for the future economic development and offers concrete, rather heterogeneous directions for their solution. It should be noted that the range of methods developed by world-leading scientists and practitioners for generating, acquiring, and disseminating the latest innovative professional knowledge is quite broad and encompasses all areas of knowledge management at all levels of management. This invention should form the basis for the development of specific activities aimed at the implementation of *the third requirement* at the regional and national levels. At the same time, the choice as a benchmark of one or another method of knowledge management should be made taking into account national features, potential opportunities, and regularities of the functioning of the economy.

This is especially true for Ukraine, where the maximum results in the scientific sphere towards the formation of the knowledge economy and the rationale for the methodology of knowledge management are limited to the subject of investing in

human capital and have not been further developed at the moment (Zakharova and Kratt 2014). In practice, only a few large relatively economically successful industrial enterprises can partly implement the principles substantiated by Ukrainian scientists, the most illustrative of which is the activity of the Joint Stock Company Novokramatorsky Mashinostroitelny Zavod (NKMZ), where in 2007 systems of personnel certification and continuous professional development of employees were introduced that aimed at stimulating the work of the most promising and gifted persons, which brings the enterprise closer to the strategic goal—talent management. As a result, at the enterprise, every second employee passes vocational training with a staff number of more than 14 thousand people and for this purpose an investment of 1.4% of the wage fund is sent (NKMZ). But there is not a single world-wide approach in the field of knowledge management towards the implementation of *the third requirement* by Ukrainian enterprises because of the large number of economic problems that arise in their activities as a result of excessive external factors. At the same time, the expediency of the transition of attracting different aspects of the world experience by Ukrainian enterprises should be carried out reasonably, gradually and differentially, in order to achieve maximum returns from different age groups of workers. That is why the chosen research topic is very relevant for Ukrainian enterprises at the present stage of their development.

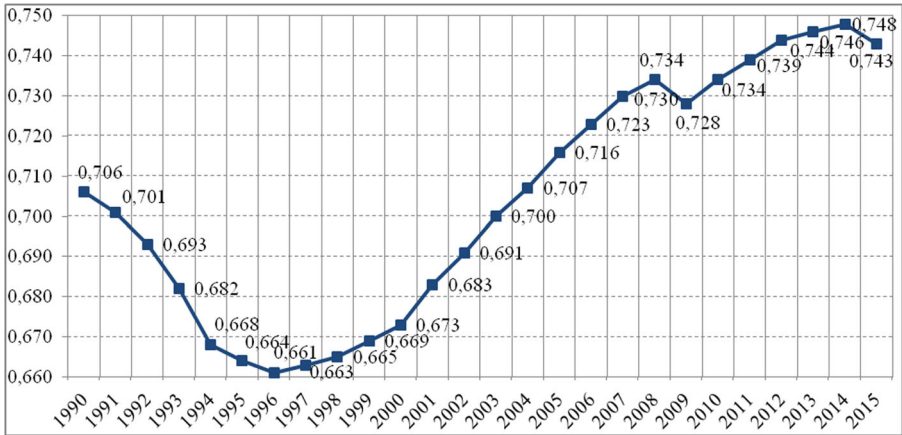
The purpose of the article is to substantiate and characterize the basic laws of knowledge management at the enterprise level, depending on the stage of the person's life cycle, which is intended to gradually approach the fulfillment of each of *the three requirements* mentioned in the abstract of this article and to form on this ground the economy's knowledge in Ukraine.

Research Boundaries

Proceeding from the fact that the process of knowledge management directly takes place at the individual and collective levels, the enterprise must become the main link in this process. It is at the enterprise that processes of creation, accumulation, and use of knowledge are observed, so that it acquires competitive advantages in the market. Understanding of this thesis by entrepreneurs and management and the spread of such processes to the majority of enterprises in the country should be the first step towards the formation of a knowledge economy in it.

Substantiation of Expediency of Activating Knowledge Management in Ukraine

The degree of achievement of the goals set by the country approaching the state of innovative development of the economy and the formation of the knowledge economy can be estimated at the international level with the help of the Human Development Index (HDI), which was developed by the United Nations in 1990 and since 1993 has been introduced for the annual comparison of the achieved level of human development in different countries of the world. During the 1990–1996s, for Ukraine, the HDI value (Fig. 1) has little annual negative tendency to fall from 0.706 to 0.661 points, the reason



Source: constructed according to <http://hdr.undp.org>

Fig. 1 Ukraine’s dynamics of HDI for 1990–2015. Source: constructed according to <http://hdr.undp.org>

for which was the proclamation in 1991 the Independence from the USSR, as a result of which there was a break in all economic ties and an attempt to build its own economic system based on market principles. Since 1997, the value of HDI has tended to grow steadily, with the exception of 2 years—in 2009, when the deterioration of the index was due to the global economic crisis of 2008, and in 2015, due to the beginning in Ukraine in 2014 of hostilities on Donbass region and the annexation of the Crimea.

Today, Ukraine occupies the 84th position among the 188 countries of the world in terms of the level of HDI and has moved to the less prestigious group of countries with an average level of development. It cannot be considered a satisfactory condition and requires the introduction of measures to stabilize the situation and strengthen human development factors.

A deeper analysis of the components of HDI made it possible to conclude that Ukraine has a sufficiently high potential level of human capital, but the unsatisfactory standard of living and the unstable social and economic situation in the country do not allow raising the level of its real use and bringing the country closer to the knowledge economy. Thus, the expected life expectancy at birth in Ukraine during the whole period of the study has a slight positive trend, but the value of this indicator has not yet reached its best level, which was observed in a relatively stable 2002. The result of this condition is a gradual annual decrease in the population of Ukraine, which during 1993–2017 decreased by 9659.5 thousand people or by 18.5%—from 52,244.0 to 42,584.5 thousand people (State).

Also, the situation in Ukraine’s economy is threatening with the annual growth rate of GDP per capita according to PPP in dollar terms—the value of this indicator increases by an average of no more than 34.0% per year (calculated by the author according to the State). Maintaining this trend and in the future can accelerate the undesirable process of moving Ukraine by rating the countries of the world to a group of countries with low human development.

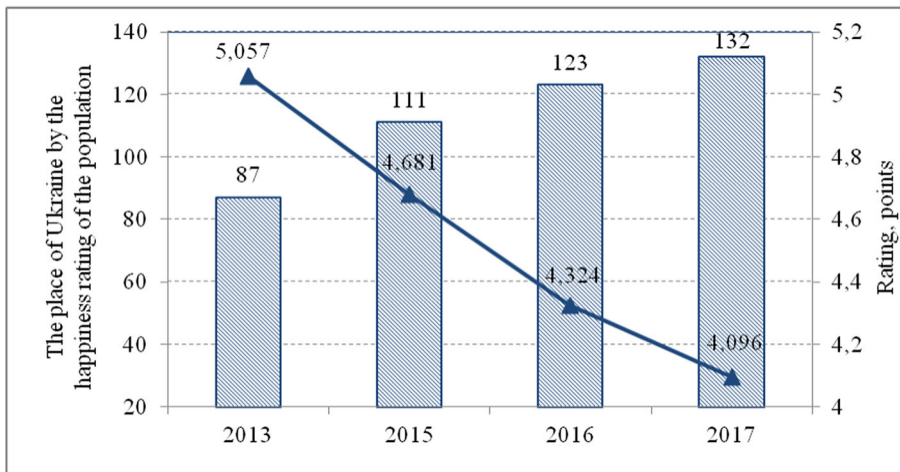
Instead, the dynamics of the index values of the level of education for Ukraine are quite positive due to the prolonged application of the current progressive policy of the development of the educational system through the large-scale involvement of all segments of the population. As a result, Ukraine is a part of the group of world leaders

in terms of the share of the adult population with higher education. At the same time, comparing Ukraine with other countries in the world, there is a change in the educational structure of the adult population towards the lead of people with higher education. That is, there is a process of replacing the workforce of the average level of qualification with a highly qualified workforce, taking place in spite of the existing and potentially possible needs and demands of the country's economy for the appropriate structure of the workforce in terms of education and professional competence. As a result, the probability that a certain proportion of people with a higher education will not be able to find work in time, which requires their level of competence will significantly increase, leading to a drastic reduction in the effectiveness of investments from different sources in their professional and funds development. Therefore, investments in human capital sent from all sources in Ukraine do not have the expected level of payback, and the acquired unique knowledge mostly remains unclaimed.

The complicated sociopolitical situation that has developed in Ukraine since 2014 has led to a sharp fall in the country's ranking in terms of the happiness of the population (Fig. 2).

Moving Ukraine from 87 to 132 places among 158 countries of the world for the last 4 years, eloquently testifies to the sharp drop in the quality of life of the population, among other things, determined by the reduction in people's sense of security and confidence in their own future. These circumstances exactly determine the need to develop and implement strategic decisions at the national and regional levels; the result of which should be a gradual increase in the population's sense of satisfaction with life. At the same time, an important role in this process should be played by professional demand and the conditions created by the employer for the continuous development of a person throughout his life.

Under such conditions, the directions of activity of Ukrainian enterprises for comprehensive management of knowledge through their identification, inventory, timely detection of a deficit, and its elimination in any way is intended to become a pledge of achieving in the near future a significant increase in profitability and obtaining stable



Source: constructed according to <http://worldhappiness.report>

Fig. 2 Ukraine's place in the world ranking of the happiness of the population for 2013–2017. Source: constructed according to <http://worldhappiness.report>

signs of competitiveness of products in the domestic market. The first step towards the spread of knowledge management tools and technologies to all spheres of the enterprise's functioning should be a radical change in the priorities underlying its existence. For these reasons, the top management of the enterprise has to break the stereotypes of thinking of all categories of employees without exception and to introduce a new organizational culture based on knowledge.

Person's Stages of the Life Cycle

One of the most important and key components of knowledge management is the people who are the sources of this knowledge, their creators and consumers (Omotayo 2015). That is, a person takes direct part in all processes of knowledge management and it depends on its ability, readiness, and interest that the effectiveness of this process, important for the development and financial stability of the process. Also a human ability to learn, accumulate and further transfer of knowledge depends on its age, level of education, practical experience, and a tendency for change throughout life (Bhullar and Kaur 2014; Sultan and Bach 2015). The generalization of the qualitative characteristics of a person's ability to acquire knowledge and the stages of her professional and personal development made it possible to single out the stages of the person's life cycle: childhood (from birth to 11 years), adolescence (12–22 years), young maturity (23–39 years) (40–55/60 years depending on the gender of the person), and the elderly (more than 55/60 years). Therefore, when developing a knowledge management strategy, the management of an enterprise must necessarily take into account the laws of accumulation of knowledge depending on the stage of the person's life cycle Table 1. A clear understanding by the management of the existing patterns of accumulation of knowledge during the life of a person will allow us to understand a reasonable approach the definition of the amount of knowledge available and necessity for the progressive development of the enterprise and to identify possible sources for their prompt involvement.

Any attempt to quantify the amount of knowledge that a person accumulates at certain stages of his life is purely conditional and generalized, and the results of such assessment may have a scope of use limited by the research objectives. In our case was set a specific task—to quantify the probable amount of knowledge that a person reaches at different ages, which means to obtain at least approximate boundaries of the accumulated knowledge of a person at different stages of its life cycle. Such an assessment should allow differentiating the strategies and approaches of the company's management to the management of human knowledge at different stages of its life. The author does not pretend to spread the established quantitative boundaries everywhere.

Specific values of the probable achieved amount of knowledge by the author in the work were determined by averaged way on the basis of a questionnaire of 195 people representing all age groups of the population: 0–11 years old—7.2%, 12–22 years—9.2%, 23–39 years—25.1%, 40–55/60 years—33.8%, and more than 55/60 years—24.7% of respondents. Respondents were selected individuals, fully consistent with the average specific characteristics of each stage of the life cycle of a person.

In general, the questions of the questionnaire covered all the possible types of knowledge that gradually acquired a person during his life and were dichotomous,

Table 1 Regularities of accumulation of knowledge during a person's life (averaged variant)

Age, years	Stages of the human life cycle	The main factor in the acquisition/preservation of knowledge by man	Probable amount of knowledge gained, % of potential human knowledge	Characteristics and directions of change in human knowledge
0–11	Childhood	<i>Education and communication:</i> family, institutions of social education, friends, the environment, mass media and telecommunications	25.0–35.0	Gradual formation of a habit and interest in learning and acquiring new knowledge; structuring information and selecting the most effective ways of obtaining knowledge
12–22	Adolescent	<i>Education:</i> educational institutions of secondary, vocational and higher education, knowledge repository (libraries, Internet), society, family	45.0–65.0	Determination of the desired areas of future employment; accumulation of theoretical knowledge base for selected areas of activity
23–39	Young maturity	<i>Professional activity:</i> achievement of professional skills through direct labor activity and intensive continuous professional development, search of the best opportunities for the practical realization of the accumulated knowledge and experience	70.0–90.0	Personal and professional development; the emergence of a person as a person and a professional; testing in practice the actions of acquired theoretical knowledge, their transformation into practical experience, skills and skills in a wide range of professional interests
40–55/60	Experienced maturity	<i>Self-development and transfer of knowledge:</i> the transformation of knowledge accumulated for work activity into practical unique experience; When creating favorable conditions, a desire is formed to convey experience and knowledge	80.0–95.0	Transformation of accumulated knowledge into practical skills and experience, narrow professional specialization; in education preference is given to self-improvement and self-development; under certain conditions, there is a need to transfer knowledge of young people; gradual reduction of motivation to acquire new knowledge
More than 55/60	Old age	<i>Communication:</i> family, inner circle, society easy work	75.0–80.0	Gradual moral depreciation of accumulated knowledge, lack of processes for their renewal; internal need to transfer experience to new generations

Source: author's development

because the answers to all questions were “truth” or “false.” At the same time, knowledge in questions was classified according to the hierarchy of scientific categories by means of mapping and transformation of objects of reality; branch of science; belonging to the fields of application; the level of functioning of knowledge; source of acquisition; means of formation, application, structuring, and fixing of knowledge; conceptual level; the functions performed by the staff in the quality of the results obtained; expiration date; and so on. The questions of the questionnaire were formulated in such a way that irrespective of the accumulated volume of knowledge, the respondent could independently and objectively predict his own potential opportunities for accumulating knowledge at any age and assess the level of their volume that had already been achieved during the interview. Thus, each respondent had to characterize all stages of his own life cycle—past, present, and future, according to his actual age.

The dichotomous approach allowed us to process the information base obtained by the questionnaire with the help of using data mining technology, and the predicted interval was given in Table 1. At the same time, the maximum possible level of knowledge reached was set at 95.0% of the potential volume of human knowledge. The difference of 5.0% was allocated to the hidden skills of a person to master complex and radically new knowledge; the ability for which a person in a calm state did not even guess, but in extreme or force majeure conditions will be easily demonstrated.

The Regularities of Knowledge Accumulation During a Person’s Life

Each of the taken steps in the theory of developmental stages of a person can be characterized by certain averaged laws of the accumulation of knowledge during life. So, in childhood, a person carries out active research of the surrounding world, learns the properties of objects, the basics of communicating with other people, etc. At the same time, knowledge is acquired by the child primarily in the horizontal plane, that is, by the continuous process of adding in the memory of small and simple portions of information from different spheres of life without detailed specification, linking, systematization, and generalization. Exception is the process of acquiring the child specific practical skills (writing, reading, counting, etc.), the effectiveness of which tends to grow gradually through daily careful execution of the relevant exercises and the consolidation of the material traversed.

Cognitive activity of the child is carried out gradually through the appropriation of knowledge and experience, which are daily transferred by the family and simultaneous acquisition of their own knowledge due to attendance of pre-school and out-of-school educational institutions, and training in school institutions. It is at this stage that the child should be vaccinated with such qualities as love of study, a thirst for knowledge, the desire to be the first and the best in the chosen field. As a result, already in childhood, the person under the influence of many factors, and first of all, due to successfully coordinated stages of vocational guidance, gets a clear purposeful pursuit of future professional activity, a vocation that will optimize the time and money spent on the realization of a professional dream, maximize the human capital, and bring closer the moment of obtaining social and economic returns from the amount of knowledge accumulated during the working life.

In adolescence, a person continues to accumulate knowledge; but during this period, this procedure transforms the simple addition of heterogeneous fragmentary information to its deepening and systematization and to obtain new large volumes of interrelated knowledge. At the same time, the procedure of knowledge accumulation acquires a specific vector, connected with the professional direction chosen in childhood. It is during this period that a person becomes independent and begins to use his knowledge directly in practice in different ways (ending high school, enrolling in an educational institution, starting work, etc.), and therefore, it is determined with their value and utility for themselves, their families and society as a whole. At the same time, depending on the sufficiency and quality of the amount of knowledge accumulated by this time, the final choice of the further type of professional activity and forecasting the model of the whole future professional and personal life of a person is carried out.

The stage of maturity is the longest and most productive in a person's life, and therefore, it is advisable to divide it conditionally into two stages practically identical in terms of the number of years: «young maturity» (on average 23 to 40 years) and «mature maturity» (on average from 40 to 55/60 years depending on the sex of the person). The rationale for such a separation is the fact that the accumulation of knowledge at each of these two stages is carried out according to different principles, which is explained by both the natural capabilities of the human brain for the adoption, processing and storage of information at various ages, and the change during the working life of the main factor knowledge entry.

The beginning of the stage of maturity is connected with an active professional search and the gradual formation of a person as a person and a full member of society, a specialist, and a professional. This is the most effective and productive time for the acquisition, generation, accumulation and using of knowledge, and the implementation of each of these processes occurs in parallel or gradually in all planes. During this period, the activation of knowledge accumulation of the processes is also carried out through a favorable sociopsychological microclimate in the team, effective teamwork, active and effective learning, motivation to create know-how, and establishing the right prospects for human development (Cristea and Capatina 2010). As a result, such efforts can result in the employee achieving a polyvalent competence, significantly increasing his own value in the labor market (Boljanović and Stanković 2012). The main driving force of development at present is the enterprise, which simultaneously personifies the customer, the sponsor, the consumer, the defender, and the guard of knowledge, generated and transformed by the employee independently and during teamwork. However, for a company, investing in such a professional is accompanied by a high level of risk and an increased probability of non-return of the invested funds for the dismissal of an employee who has been offered better conditions elsewhere (Know how 2005; Zakharova and Kratt 2014). Firstly, a person at this stage of his development builds his desired career and depending on the degree of satisfaction with the speed of advancement on the career ladder and the working conditions created at the enterprise, demonstrates a certain social and professional mobility. Secondly, if there is dissatisfaction with the level of wages, the volume of the social package and the intensity of professional development activities, a promising employee with high professional potential, other things being equal, will make a decision to start searching for better conditions for using his human capital and for switching to another enterprise or opening his own business.

On average, a 40-year-old person attains human maturity and a level of professional development and mastery when he begins to understand and value of his own competence, experience, the value of accumulated knowledge, and in accordance with this will be a well-deserved return on the efforts made during the past working life (respect for colleagues and management, a decent salary, corresponding to the invested professional efforts and accumulated human capital position, a reliable reputation of the enterprise in the market, etc.). The interest in own development is still high, but the approach to its implementation is changing—instead of multi-vector full-scale training and simultaneous acquisition of knowledge in many related fields in the framework of professional activity, a person begins to focus and focus exclusively on the narrow specificity of his profession, instrumental support of the already existing knowledge and skills in accordance with constantly progressing market requirements; that is means, from the moment of achievement of the state of experienced maturity, the person himself begins to play the role of the main factor in managing his own knowledge, and consequently determine the necessity, periodicity, and content of any developmental and knowledge transfer activities. In parallel with this, a cardinal change in the person's value orientations also takes place, because of which the care for one's own health, material and professional stability, comfortable working and resting conditions, and confidence in one's own future coming to the fore.

At this stage of the life cycle, a person as a personality and a professional has already fully formed acquired and the maximum level of professional knowledge, professional experience, and competence. From the point of view of the effectiveness of the knowledge management process, it is very important to formulate this knowledge, formalize it, codify it, and transfer it as completely as possible to other employees of the enterprise, that is, to transform individual and personal knowledge into organizational ones (Krstić and Petrović 2012). For this purpose, an effective system of stimulating and encouraging experienced workers to transfer experience and knowledge to the younger generation should be developed and implemented at the enterprise (Szakály 2002). It is this kind of system that should become one of the elements of an organizational culture aimed at attracting and educating talent directly at the enterprise and activating the innovative creativity of workers.

From the moment of reaching, the «advanced age» stage, the person, due to a natural vocation and final clarification of life purpose, focuses exclusively on himself and his own family directing all his efforts to maximize the time of productive use of the body, providing all-round assistance to relatives and friends, saving and protecting families. Interest in personal professional development is organically replaced by the internal need to transfer to someone the accumulated knowledge, skills, and experience (including life skills), an acute need for a sense of one's own importance, need, and social relevance.

In addition, the age factor triggers two differently directed vectors of influence on the processes of human accumulation and use of knowledge. The first such vector for action is positive, which manifests itself in the continuous process of professional and personal development, thereby accumulating knowledge, experience, and skills throughout life. There is a positive dependence, according to which, as the age grows, the volume of human capital of an individual increases. Secondly, it is a negative shade and is based on the effects of another dependence—due to age-related changes in the body, people are increasingly confronted with objective problems of memory

impairment and mental acuity; the difficulty of qualitatively and fully mastering new material, the speed of reaction, is multiplied by the high rates of daily depreciation of knowledge from—the growth of requirements for their quality (structure, depth, novelty, etc.). In process of time, there is a gradual negative process of half-life and a drop in the value of knowledge accumulated by a person during life, a reduction in their quality, which reduces the useful effect of their further use. Depending on which vector in a particular period of a person's life will be dominant by value, the result of their algebraic summation will take a positive or negative connotation. The resulting ratio of these vectors has a moving character in time, depends on such factors as the age at which the person is on the assessment; features of the physiological heredity of the organism, the type of character, the degree of social mobility, and the state of mental health; standard of living and material prosperity; degree of uniqueness of knowledge and skills of the individual and their relevance in society and the like.

The Role of the Enterprise in Ensuring the Effectiveness of Knowledge Management at Various Stages of its Life Cycle

The analysis allows us to draw a conclusion according to which an enterprise, building its policy of knowledge management to implement an updated mission, has a diversified strategy for implementing the chosen course in accordance with the age of the bearer of such knowledge (Table 2). Moreover, the degree of effectiveness of these strategic decisions will depend not so much on the completeness of coverage by active actions of the enterprise's employees but rather on the complexity and far-sightedness of the actions selected by management. This will bring the enterprise closer to the social status of the socially responsible entity of economic activity, increase the level of staff loyalty, and form a toolkit to support its own personnel policy of attracting and educating talents for the long term.

The rationale for a specific strategic solution for each stage of the person's life cycle, with the aim of bringing the enterprise closer to the fulfillment of *the third requirement*, was based on the results of a questionnaire on the regularities of the accumulation of knowledge (Table 1). The main criterion in this case was the maximum involvement of all possible ages of the population of the region where the enterprise is located. Thus, it was found that in childhood, a person probably reaches 25.0–35.0% of the potential volume of adult knowledge—like a small amount of knowledge that cannot bring significant benefits to the enterprise. However, considering the fact that each next generation differs from the previous one with greater creativity and an unconventional outlook on life, the extension of the enterprise knowledge management strategy to school education institutions in the region will allow it to activate its innovative activities and form a potentially active and motivated environment for rejuvenating the staff for the future execution of *the first requirement*.

The maximum fulfillment of the second and third conditions is related to the period of human life, between adolescence and experienced adulthood. In this period, it is probable that from 45.0 to 95.0% of the potential volume of knowledge of an adult active person is formed (Table 1). All strategic decisions of the management should be directed both at the formation of a person's motivation for continuous development, and on the implementation of all procedures for the transformation of knowledge

Table 2 Strategic decisions of the enterprise on activation of knowledge management processes depending on the stage of the life cycle of a person

Stages of the human life cycle	Strategic decision	Possible directions	Expected results
Childhood	Patronage over one or more schools in the district	School of professional day off; excursions by the company, communication with specialists; the possibility of taking part in the development of advertising companies, sociological research; participation in competitions for updating product design, logos, etc.	The interest of as many children as possible with the specifics of the enterprise's activity, their preliminary professional self-determination attraction of new non-standard ideas
Adolescent	Involving young people and young graduates	Active cooperation with schools, technical schools and universities as a base for all types of practice with the possibility of selecting the best people for employment; the provision of part-time employment opportunities and internships for adolescents and students; technical assistance to educational institutions, the creation of laboratories, branches	Involvement of active, initiative and promising youth; distribution of specialized information about the enterprise; implementation of innovations and ideas created by young people
Young maturity	Active professional development and opportunities for career growth, codification of knowledge	Continuous professional development and training; functioning of the institute of the personnel reserve; stimulation of all kinds of innovations; creation of favorable working and rest conditions; support and support of innovative corporate culture; transformation of implicit knowledge into explicit knowledge, codification and distribution	The content of the most promising specialists; approaching the time of the onset of recoupment from investing in human capital; introduction of innovations
Experienced maturity	Creating conditions for the transfer of experience and the preservation of human health	Creating of the institution of mentoring; periodic training and attendance of specialized courses; decent wages and working conditions, social security; mandatory annual medical examination and insurance inventory of accumulated knowledge and their evaluation	Transfer of experience and knowledge of youth; annual growth of economic and social returns from investments in human capital; high staff loyalty
Old age			

Table 2 (continued)

Stages of the human life cycle	Strategic decision	Possible directions	Expected results
	Using and commendation of the experience and knowledge of older and former workers	Creating a museum of the history of the enterprise and establishing its high role in the formation of corporate culture; carrying out actions of assistance and support for former employees; honoring professional dynasties; attraction to mentoring and enlightenment of youth, conducting excursions by the enterprise	Preservation and transmission by any means of accumulated experience and knowledge from summer and former youth workers

Source: author's development

without exception. Instead, at an old age, a person begins to lose the accumulation of knowledge through physiological peculiarities of the organism and their size probably reaches 75.0–80.0% of the potential knowledge of the adult active person (Table 1). The structure and essential completeness of knowledge of the old person are also changing—their function of innovation is reduced, which is replaced by many years of experience and practical skills. The retirement of such a person means a complete loss of such important knowledge and experience for the enterprise, the cessation of the process of transforming implicit knowledge into explicit ones, which significantly complicate the fulfillment of *the third requirement*. That is why attracting older workers to work with young people will increase the effectiveness of knowledge management processes.

So, the company's choice of a knowledge management strategy as a basic is rather ambitious and responsible tool for the practical implementation of the mission of an enterprise must entail a number of diverse activities that must be of the nature of a «broad front» and must be oriented towards meeting these three requirements that are substantiated in this article. A promising step will be the introduction of mandatory cross-patronage work with two categories of the population in the geographic location of the enterprise—with interested young people and individuals who have long worked at the enterprise and have already retired. The effect of such a step will exceed expectations.

Advantages for the enterprise implementation of these strategic decisions will be as follows:

- Uninterrupted professional training and motivation and professional self-development for staff

- Getting the necessary amount of knowledge on the most priority for the development of the company areas

- Creation of motivational conditions for the development, attraction and implementation of innovations, the generation of innovative management solutions, rationalization proposals, and the like

The introduction of an effective system of continuity of knowledge and experience
 The growth of intellectual capital and the amount of knowledge of the enterprise
 optimization of the level of staff turnover rate due to the increase in the degree of
 vocational vocation and employee loyalty to the enterprise
 Effective use of intellectual capital
 Increasing the effectiveness of management decisions
 A high level of return on investment in human capital

Accumulation of these advantages in the long term will allow the enterprise to achieve human, financial, and economic stability, increase the level of competitiveness in the market and approach the practical implementation of a corporate culture based on knowledge.

Conclusions

Ukraine's achievements in this desirable state of the knowledge economy are associated with many problems, the partial successful solution of which in the future should be laid already today, by introducing changes at the lowest and most natural level—the individual and the enterprise in which it operates. The patterns of accumulation and change in human knowledge at four main stages of its development throughout life are suggested: childhood, adolescence, maturity (young and experienced), and elderly age. These regularities are the basis for sound strategic decisions to enhance knowledge management at the enterprise level.

Further scientific research should be directed towards the development of concrete measures for the implementation of each of the strategic decisions on the activation of knowledge management processes proposed in the work. The conditions for ensuring the socioeconomic returns from the knowledge and knowledge accumulated by the individual and the enterprise, and well-grounded effective methods of maximizing the effectiveness of their use, should be carefully investigated. Dissemination of the results of such studies to all spheres of human activity without exception will allow raising the level of HDI and the happiness index of the population, bringing Ukraine closer to the state of the knowledge economy.

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