KAPITEL 1 / *CHAPTER 1* [1]
HUMAN CAPITAL AND LABOUR POTENTIAL: CAPITALISATION OF COSTS

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Introduction

Human capital is one of the most important economic categories, the interest to which among scientists and practitioners has been growing especially recently. And this is not accidental, because human capital is multifaceted in the forms of manifestation of its essence and is categorized as the most valuable resources used by society. Therefore, the theory of human capital in science seems to be the key that opens the door to cognition of such phenomena as human development, efficiency of social labor, its reproduction, motivation, return on labor costs, the importance of education and professional development as a source of economic growth. An essential element of human capital is the creative potential of a person, which ensures the development of a skilled labor force and becomes the most effective lever for achieving economic growth.

Economic science has already proved that human capital is an exponent not only of productive forces, but also of production relations in society. Therefore, both labor itself, representing the process of functioning of the labor force and expedient human activity, and its human capital has a dual nature. On the one hand, the result of human labor is a certain use value as a natural form of expression of physical capital, on the other hand, its result is value as a social substance of the results of human capital functioning in a certain social environment.

In comparison with physical capital, the distinctive feature of human capital is that its ability to create is inseparable from its bearer and owner, i.e. the person himself. Hence, the development of human capital in market conditions is consistent with the economic interests of its owner, i.e. the employee, and the interests of the owner of physical capital, i.e. the employer.

The combination or contradiction of economic interests of the owners of human

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and physical capitals has led to the need to use the value form of expressing the level of human capital and the results of its use. The level of human capital is determined by the total investment in it, while the result of its use is determined by the return on investment.

There is an organic relationship between human and physical capital, the result of which arises in interaction with physical capital. The latter is a generation of living labor, i.e. the functioning of human capital, transforming into embodied labor, i.e. physical capital.

It is quite obvious that human capital is the primary link of production, while physical capital is secondary, derived from human capital. This interrelation and production combination of the two types of capital is the cradle of the emergence of the economic category - labor potential, when human capital turns into the value substance of labor potential. And most importantly. In the production interaction of human and physical capitals, the production relations of owners are manifested and formed: the hired worker - the owner of human capital, which is inseparable from the person, and the employer - the owner of physical capital in the workplace. The form of manifestation of production relations between these owners is the hiring (leasing) for productive use of the ability to work on the part of the hired worker, for which he receives a wage determined by the labor contract, on the other hand, the employer's renting to the hired worker of physical capital at the workplace for productive use, for which the latter receives a profit. The contradictory nature of these relations of production arises over the production of the results of labor, exchange, distribution, appropriation and their use. In the process of these stages, labor inputs are transformed into human capital, i.e. there is a process of their capitalization.

The above considerations indicate the relevance of the topic of human capital and labor potential and its importance for economic theory and practice, as well as its essential role in human progress.

1.1. Analyzing studies and publications

In economic science, the theory of human capital has more than half a century of history. The origins of the theory of human capital came from the classics of political economy, the creators of the labor cost theory of capital, A. Smith and K. Marx. But it began to develop with truly giant steps from the middle of the 20th century, turning into an independent direction of economic thought after the publication of the works of Nobel Prize winners Theodore Schultz and Harry Becker, representatives of the so-called Chicago school. The growing importance of intellectual potential in the socio-economic development of production became the impetus for their research interests.

Their followers include such famous foreign and domestic scientists as A. Marshall, J. Mill, J. McCulloch, G. MacLeod, I. Fisher, F. Machlup, R. Ehrenberg, R. Smith, A. Dobrynin, I. Korogodin, L. Semykina, V. Smirnov, M. Krutsky, E. Grishnova, R. Kapelyushnikov, L. Nesterov. In the works of these and other authors, when considering the essence of human capital, the criteria of "investment in education and professional training" are mainly used. At the same time, investments in the reproduction of the human organism itself during the labor period at the expense of its earnings and, moreover, investments in a person during the period before entering labor activity are practically not taken into account. This essentially distorts the biophysical nature of a human being, for the human being's abilities to creative activity, inherent only in his living organism, are not taken into account. Nevertheless, in recent publications of young researchers in Ukraine, the prevailing viewpoint is that the essence and level of human capital is determined by investments in general knowledge and professional level or continuing professional education. For example, M.O. Krymova believes that in modern conditions education is the main factor in the formation of human capital [11].

S.Y. Buntovsky argues that the concept of "innovation activity of workers" represents an internal element of human capital of an individual [2].

V.V. Vazhinskaya believes that the essence of human capital is defined by a mobile set of quantitative and qualitative competences of employees formed by the

parties to social and labor relations [3].

These characteristics are the development of theories about human capital published by famous scientists from different countries and at different times. For example, in the textbook "Labor Economics and Social and Labor Relations", under the scientific editorship of Prof. A.M. Kolot, the essence of human capital is disclosed as follows: "Human capital is a certain stock of health, knowledge, skills, abilities, motivations formed and developed as a result of investments and accumulated by a person, which is purposefully used in the given sphere of economic activity, contributes to the increase in labor productivity and due to this affects the increase in the income of its owner, profit of the enterprise and national income" [18, p. 280].

Some representatives of Western schools also stand on such positions [1; 17] and other researchers [4; 5; 6; 12; 13; 14].

More significant number of published works in Ukraine is devoted to the problem of labor potential, which, however, do not reveal the internal connection of this category with human capital. Such works include publications by N. Lukyanchenko, L. Shaulskaya, I. Bazhan, B. Genkin, M. Kim, V. Lych, S. Puchkova, and others.

In most cases, the above authors of studies of labor potential in determining its essence give preference to demographic criteria of its formation (the number of workers and the total fund of their working time), i.e. they absolutize the extensive level of labor potential, overlooking such characteristics as its intensity, quality, working conditions, its motivation, i.e. the qualities that are manifested in the workplace. It also fails to take into account that except for the workplace, there are no methods of measuring social intensity, quality, motivation and working conditions at the macro level. At the same time, changes in these indicators are reflected in such a comparable indicator at all levels of economic management as wages. Therefore, in our previously published works we proposed methods of measuring the level of labor potential by the indicator of labor remuneration with social contributions and costs for continuous professional training [8].

However, it should be taken into account that the efficiency of human capital use or the result is manifested only in the sphere of its labor and production functioning as

a result of interaction with the means of labor. For example, the result of functioning of a worker's human capital is manifested in interaction with machines, mechanisms, tools, while for a scientist - in interaction with such means of labor as a computer, microscope, telescope, laboratory instruments, laboratory equipment, etc. The result of human capital of an artist is manifested in interaction with brushes and paints. For an artist, the result of his human capital is manifested in interaction with brushes and paints, easel and other tools in the form of a painting, for a surgeon - in interaction with a scalpel and medical equipment the result is a saved human life, for a composer - in interaction with musical instruments, notes and other tools the result is a symphony or other musical work, etc. The result is a symphony or other musical work. Therefore, it is inappropriate to narrow the idea of the essence of human capital only to the level of investment in general and professional education.

Hence, the purpose of this paper is to develop theoretical provisions on the essence of human capital in the structure of labor potential, methods of determining the level and efficiency of the use of these categories in economic practice.

1.2. Development of theoretical provisions on the essence of human capital in the structure of labor potential

As a result of the ongoing research, it is found out that the following scientific provisions should be taken into account in solving the economic problems of human capital and labor potential:

1. The value of human capital is formed throughout a person's life. The incremental part of investment in human capital on general and professional education, of course, increases its value. But innate and developed abilities of a person to creative activity are inherent only in his living organism, with the death of which they disappear. Therefore, the value of human capital should also include investments in the development of the biophysical state of the human organism, in the maintenance and reproduction of its labor capacity. The source of such investments, apart from

employers' funds, is the employee's own earnings, which are realized on the principles of self-financing. In addition, the cost of human capital should include the costs of parents for the formation of a person in the period from birth to his or her entry into working life.

2. The essence of human capital can be expressed as a set of useful qualities formed and developed in the process of a person's life activity: biophysical state of the organism (health), mental and physical abilities, general and professional knowledge, experience and motives, expressed in value form and suitable for his labor activity, inseparable from the person, the owner and carrier of which he is, and bringing him and society income.

3. Human capital, like its labor, also has a dual nature: on the one hand, in the process of functioning it shows the ability to create a specific production result, use value, on the other hand - to expend human energy in general, the reproduction of which requires investments equivalent to the cost of labor force. In this case, the evaluation of human labor costs requires value measures.

4. The useful qualities and effect from the use of human capital are manifested only when it interacts with physical capital in production conditions in order to obtain the desired result. When human capital is combined with such material and moral factors of production as machinery, production technology, organization and stimulation of labor and other conditions under which the intensity, quality and productive power of labor are manifested, it turns into labor potential. In this case, human capital acts as a value substance of labor potential.

5. Formation and development of human capital takes place during a person's life until the end of his labor activity. Historically, this period can be divided into 3 stages:

pre-production stage of formation. It covers the period of time from the birth of a person to the beginning of his labor activity. During this period a person forms his biophysical and mental potential, receives basic education and upbringing at the expense of investments of parents and other sources in the form of non-repayable credit;

reproductive stage. It is the longest and is associated with production and other

creative activities of a person. Investments in human capital are made during this period at the expense of personal income, the amount of which should be equivalent to the reproductive costs of labor force, i.e. sufficient for the expanded reproduction of human capital and satisfaction of the needs of workers and their families;

innovation stage. In time, it is combined with the reproductive stage, but the source of investment in vocational training is mainly the employer's funds and other funds, and partly the employee's own salary.

As part of human capital, we distinguish intellectual capital, which we qualify not as an independent economic category, but as its most significant element, which has quantitative and qualitative expression, the cost substance of which is the cost of acquiring universal and professional knowledge, production (labor, creative experience). The qualitative manifestation of intellectual capital is the product of human brain functioning, which is inseparable from the vital activity of the human body.

Intellectual capital has quantitative certainty, which is equal to the costs determined by the above stages of human capital formation. The innovation stage is determinant in assessing the level of intellectual capital.

Expenditure on human and intellectual capital itself is not yet capital. Capitalization is not the process of production use of accumulated knowledge or objectification of concrete labor, its transformation into material elements of production, consumer value, as it is presented by some researchers, but as a product of production relations between an employee, i.e. the owner and bearer of human capital and the owner of means of production (employer, owner of physical capital), if he/she is not an authorized agent of the owner of means of production, in relation to: production and production of goods, services, goods and services, as well as the product of production relations between the employee and the owner of the means of production (employer, owner of physical capital).

Thus, it has been established that human professional qualities themselves are not yet intellectual capital. Their capitalization begins in the process of using knowledge in a specific labor process and obtaining the result in the form of use value, and ends

with its transformation into a value form, resulting in the costs of abstract labor, in the sphere of socially defined production relations. The qualification of the value of human knowledge and mental qualities will be expressed in the form of capital as long as there is class stratification in society.

1.3. Model of formation and development of human capital and labor potential

Finally, the category of labor potential. In our understanding, labor potential is a potential or real value of labor resource, capable of ensuring the necessary production and social result at various levels of economic and labor management in certain socio-economic and technological conditions. Thus, human capital represents the value substance of labor potential. Quantitatively, labor potential exceeds the value of human capital by the sum of depreciation of fixed assets and technological energy used in the labor process and attributable to one person. And the efficiency of human capital use for the employer is manifested through the functioning of labor potential. The cost model we have developed and the stages of formation and development of human capital are presented in Figure 1.

The organic link between human capital and labor potential is manifested in the mechanism we have disclosed that expresses the organic link between human capital and labor potential (Figure 2).

Figure 3 shows our proposed schematic diagram of the organic relationship between human capital and labor and other types of potentials.

Hence the calculation of the value of human capital in average annual terms ($\sum V_{hc}$) can be performed according to the following formula proposed by us:

$$\sum V_{hc} = \frac{C_{pre-pr/f}}{T} + \frac{C_{hc}}{I_{cp}} + \Delta C_{hc}, \quad (1)$$

where $C_{pre\text{-}pr\,f}$ - costs of pre-production formation of human capital. Cash income per inhabitant (region, country) is taken into account;

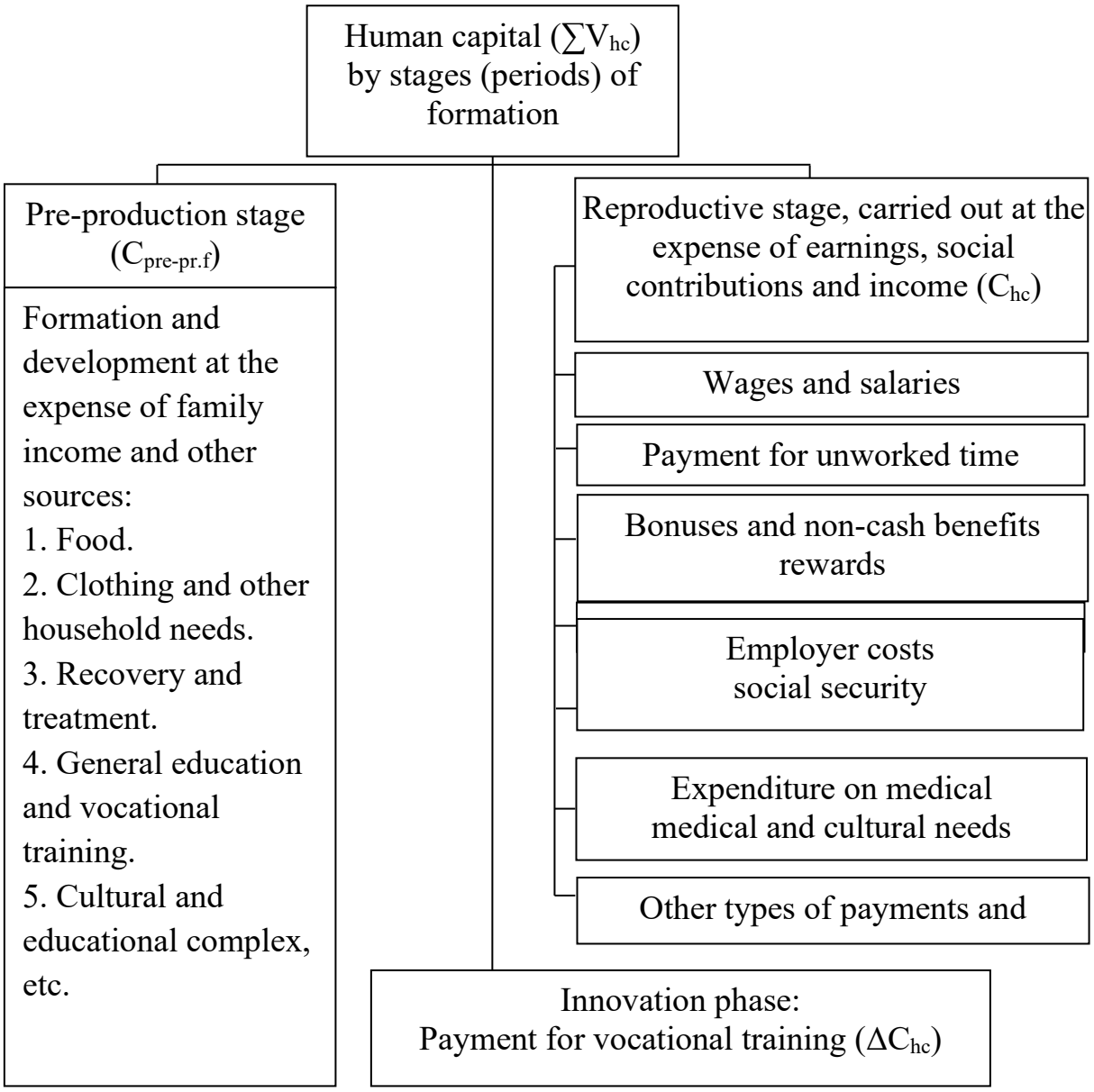

Figure 1 - Cost model of formation and development of human capital at enterprises [9]

T - average number of years of pre-production formation of human capital (we take an average of 22nd years);

C_{hc} - average annual reproductive costs of human capital. It is taken at the level of average annual salary of one worker, including social contributions, UAH;

I_{cp} - consumer price index;

ΔC_{hc} - average annual investment in human capital at the innovation stage of the production environment, spent by the employee or the employer for professional training, UAH.

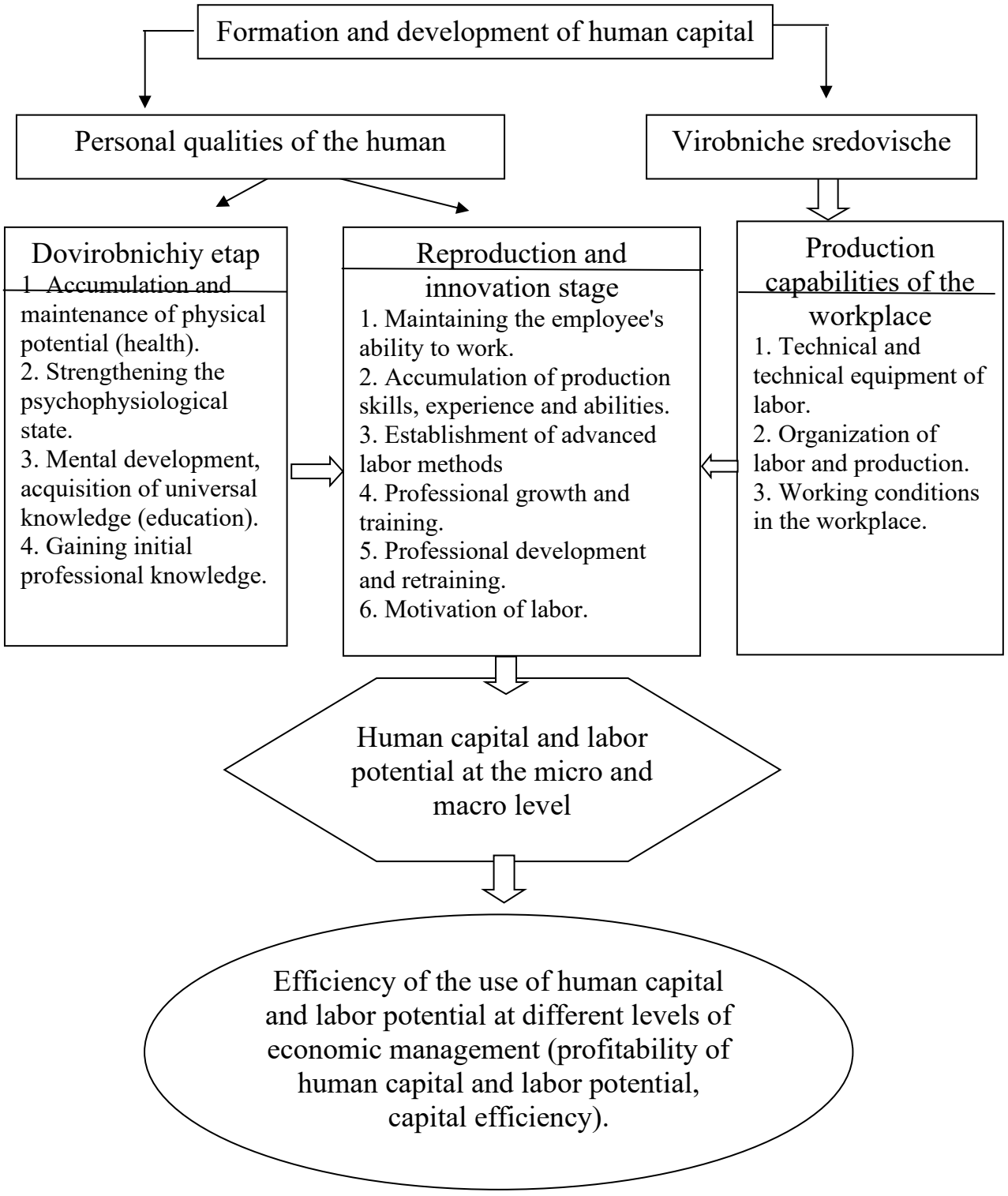

Figure 2 - A mechanism expressing the organic connection between human capital and labor potential at the local level (workplace) [9]

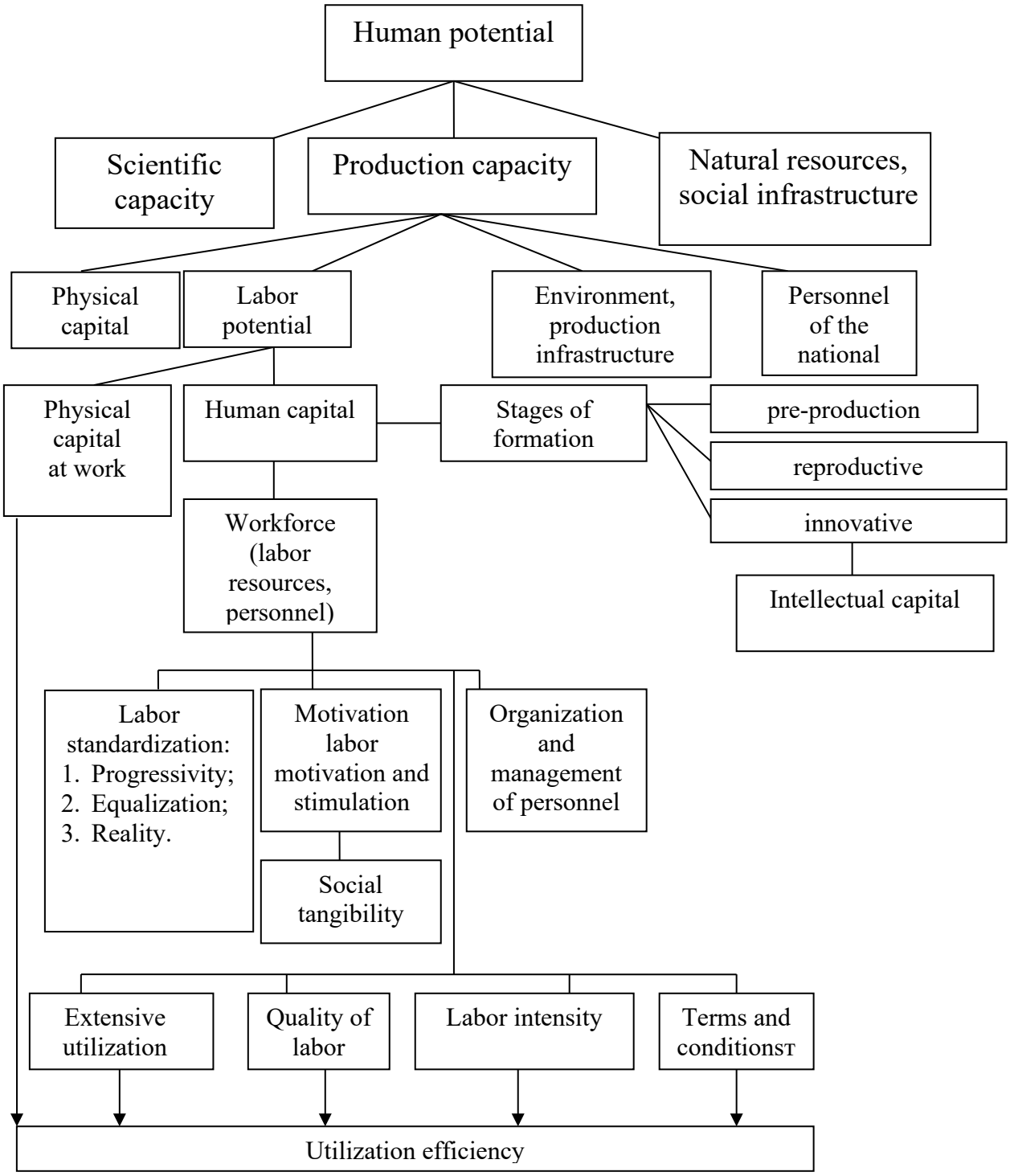

Figure 3 - Principle scheme of organic interrelation of human capital elements in the structure of labor and other types of potential [9]

To calculate the total value (cost) of human capital at an enterprise or at a higher level of economic management the value of ($\sum V_{hc}$) is multiplied by the average number of its personnel (P_{an}). In this case the formula (1) will have the form:

$$\sum V_{hc} = \left[\left(\frac{C_{pre-pr\ f}}{T} + \frac{C_{hc}}{I_{cp}} + \Delta C_{hc} \right) \times P_{an} \right]. \quad (2)$$

The value $\left(\frac{C_{hc}}{I_{cp}}\right)$ expresses the level of real rather than nominal income, which clears the indicator from the influence of inflation.

To assess the efficiency of human capital and labor potential, we have adopted the following indicators: profitability of human capital, as well as capital output and return on labor potential.

Efficiency of human capital utilisation by the "profitability" indicator (R_{hc}), can be determined by the formula:

$$R_{hc} = \frac{P_g \times 100}{\sum V_{hc}}, \quad (3)$$

where P_g - gross profit of the enterprise, UAH.

Calculation of capital return or return on labor potential (Cr) can be done using the following formula:

$$C_r = \frac{Q - \sum T_{hc}}{\sum T_{hc}}, \quad (4)$$

$$\text{or } C_r = \frac{P_g + M_c}{\sum T_{hc}}, \quad (5)$$

$$\text{or } C_r = \frac{P_g + (C - \sum T_{hc})}{\sum T_{hc}}, \quad (6)$$

where Q - volume of marketable products, UAH;

$\sum T_{hc}$ – total expenditures on human capital, UAH;

M_c – material costs for marketable products, UAH;

C - cost of marketable products output, UAH.

Taking into account the absence of reported statistical data on investments in human capital in the pre-production period, their value (C) can be determined by the formula proposed by T.M. Osipchuk [15]:

$$C = \frac{P}{N}\%, \quad (7)$$

where P - annual income from parents' professional activity, UAH;

N % – capitalization rate.

Based on the above theoretical provisions on the structure of labor potential, we propose to determine the value of expenditures on it ($\sum V_{lp}$) by the formula:

$$\sum V_{lp} = \sum T_{hc} + \sum V_{a\ afp} + \sum V_{er}, \quad (8)$$

Where $\sum V_{a.afp}$ - average annual depreciation charges on fixed production funds per one employee, UAH/person;

$\sum V_{er}$ – average annual costs of energy resources for technological purposes per one employee, UAH/person.

1.4. Methodological approach to human capital assessment

In the course of the research we have also developed a methodological approach to assessing the human capital of an individual in the continuation of his or her active life activity (until the retirement age). The practical significance of this methodological approach is confirmed by the possibility of its application in solving such social issues as the assessment of compensation payments related to an accident.

For example, in Ukraine, it is known that certain types of insurance have established compensation payments in case of death. In particular, under the Law of Ukraine "On Compulsory Insurance of Civil Liability of Owners of Land Vehicles" for the death of a person hit by an insured driver, a payment of up to UAH 320 thousand is provided. The same amount is calculated for the death of a passenger on railway transport, UAH 500 thousand for air passengers on flights. - for air passengers on flights within Ukraine.

Insurance compensation in case of death at the enterprise is calculated on the basis of the average earnings of the victim. According to the Law of Ukraine "On State Social Insurance against Accidents at Work", the family of the deceased will be paid his average earnings for the last five years, as well as the "Survivors' Pension" to his dependents.

The amount of the pension is calculated on the basis of earnings divided by the number of dependents together with the deceased. His share is deducted and the

remaining amount is distributed to all with the prospect of monthly payments until adulthood.

The amount increases significantly depending on the status of the deceased. If a judge dies, his heirs will be paid ten years' salary. And the higher the rank of a judge and his/her salary during his lifetime, the higher the sum insured will be paid to his/her relatives.

The cost of life of law enforcement officers is as follows: for the death of an ordinary policeman in the line of duty his relatives are paid 250 times the subsistence minimum. If he was killed in the fight against organized crime, he is paid an amount equal to ten years of annual allowance. The maximum compensation that relatives of a deceased law enforcement officer can receive (depending on rank and position) is 750 times the subsistence minimum. The life of people's deputies is most highly valued. According to the Law of Ukraine "On the Status of the People's Deputy of Ukraine", who is subject to compulsory state insurance for the amount of his ten-year annual allowance.

As we can see, the amount of compensation payments for the death of a person has a significant range of fluctuations, which is determined by the social status of the person. But the methods of calculation of compensation amounts are not widely known in the open press. This indicates the relevance and importance of the issues of developing the methodology of human capital assessment, which includes the assessment of compensation payments.

When considering methods for estimating the value of human capital at the level of a person's life cycle, in addition, the labor experience of a worker, average annual pension and average life expectancy at retirement age should be taken into account. Thus, to calculate the value of human capital during the life cycle, its value ($\sum V_{hclc}$) can be determined by the following formula we propose:

$$\sum V_{hclc} = T_{hc} \times L_s + P_h \times V_{lp}, \quad (9)$$

where L_s - maximum possible length of service, years;

P_h - average annual size of pension, UAH th;

V_{lp} - life expectancy at retirement age, years.

Thus, in relation to the issue of quantitative assessment of compensation payments for a deceased person, it is necessary to proceed from the theoretical provisions on human capital, which can be facilitated by the methods proposed by us. In this case, the differentiation of the size of payments for individuals with different social status will be determined by the different level of income of specific individuals during their life at the reproductive stage.

1.5. Quantitative assessment of human capital and labor potential

The analysis shows that the most significant value element in the composition of human capital and labour potential is the real wages of workers. It expresses not only its reproductive but also stimulating function. Therefore, it is important that its use should be efficient and encourage workers to increase the success of their work. As it is evident from the analysis, the most significant value element in the composition of human capital and labour potential is the real wages of workers. It expresses not only its reproductive, but also stimulating function. Therefore, it is important that its use is effective and encourages employees to increase the success of their labour.

Our research has established that the solution to the problems of labour motivation is possible in the creation of a mechanism of economic incentives for enterprises and regions to improve the efficiency of labour potential use. The variant we proposed earlier contains a method of determining the change in profit tax depending on the efficiency of labour potential use, measured by the level of labour intensity of products. At the same time, a permanent normative coefficient of preferential deductions to the budget on profit tax depending on the efficiency of labour potential use is also established [9]. This mechanism of stimulating the effective use of labour potential will interest enterprises and regions not in increasing the mass of labour potential, but in reducing the labour intensity of products.

Wage structuring is one of the ways to improve the methods of stimulating labour success. It provides for the establishment of basic (tariff) wages at the reproductive

level equal to the cost of labour force, and the number of bonus indicators and payment of incentive bonuses for labour success should be minimal, and the level of incentive payments should be higher than the threshold of their social tangibility for the employee and his family.

The role of human capital is especially great in the production environment, where it has the most productive impact on its efficiency and competitiveness. Therefore, it is necessary to systematically monitor the accumulation, information support, accounting of the level and value of human capital of individual groups and categories of personnel, their influence on corporate labour results and improvement of personnel work.

The initial value of an individual's human capital is established at the time of his or her entry into employment.

The value of an employee's human capital is determined by an appropriate coefficient, which is determined by the ratio of his personal level to the level of an enterprise employee with a minimum level of human capital.

According to the level of the coefficient, the employees of the enterprise can be classified into groups, which follows from the mechanism of human capital value management and accounting that we have developed (Figure 4).

The need to preserve valuable human capital requires the development of a set of legal, psychological, economic and financial measures to prevent the loss of especially valuable human capital at the enterprise. Such measures include increasing the level of cost payment accordingly to the value of human capital, improving psychological comfort, working conditions, living conditions, etc., as well as improving the quality of human capital.

Scientific labor rationing plays an important role in the assessment of human capital and labor potential, and the efficiency of their use. However, it so happened that with the transition of the Ukrainian economy to market methods of management in economic theory and practice, the interest in scientific methods of rationing faded. This was largely accompanied by the replacement of sectoral management of enterprises by regional management.

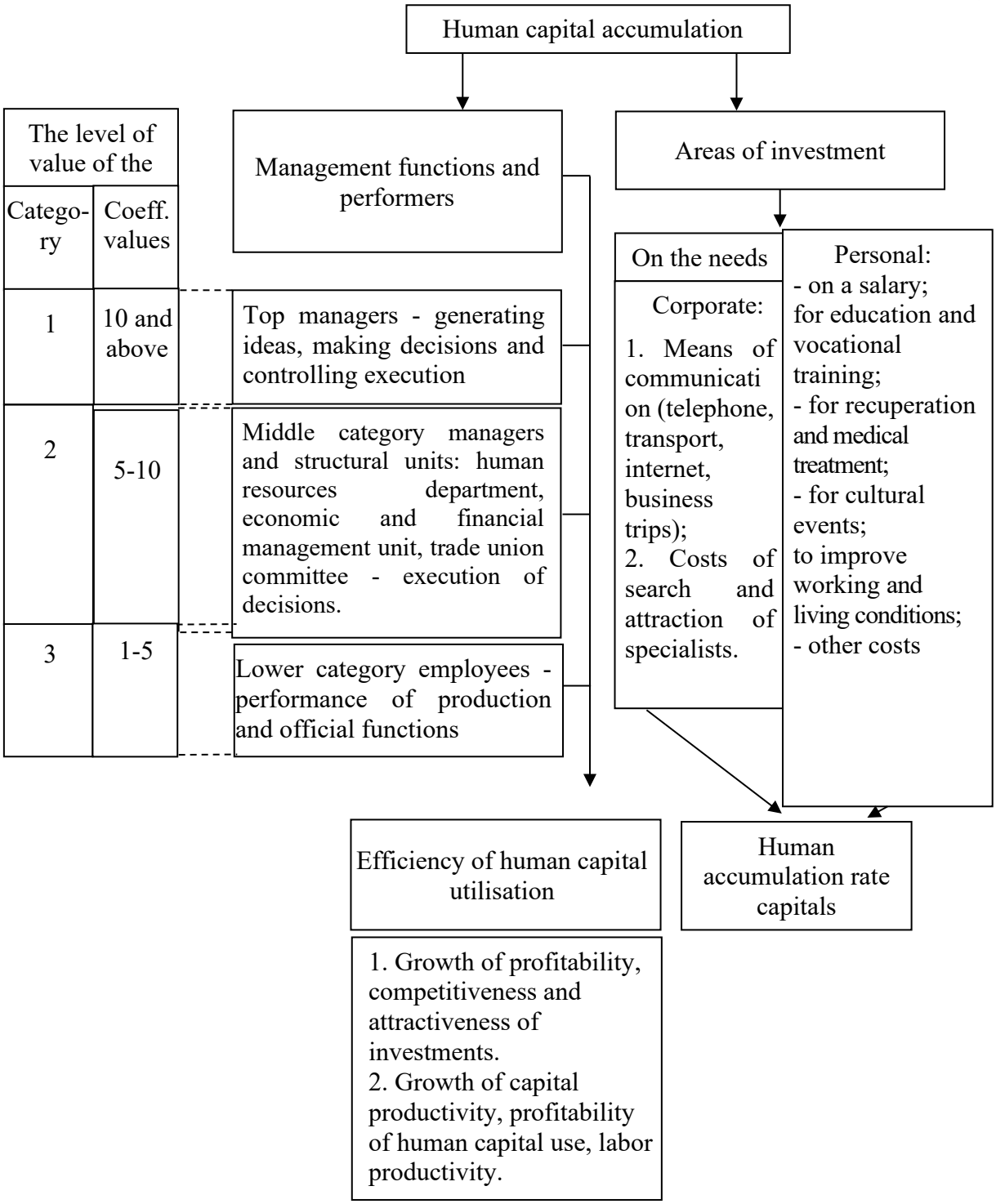

Figure 4 - Mechanism of management and accounting of human capital value accumulation at the enterprise [10]

To express the norm of labor in value form, as well as in the structure of human capital and labor potential, we propose the following methodological approach:

In the structure of human capital value, the normed part of labor costs (annual earnings of a worker) is a certain share (R_{hc}), the value of which can be determined by

the formula:

$$R_{hc} = \frac{C_s + C_{ow}}{\sum T_{hc}} \times 100, \quad (10)$$

where C_s - annual salary costs for fulfilling labor norms by 100%, UAH;

C_{ow} – annual expenses on wages for overfulfilment of labor norms, UAH;

To convert the value of the labor rate expressed in physical terms into value form (S_{wr}), the following formulae can be applied:

a) for the calculation of standardized wage rates:

$$S_{wr} = D_r \times D, \quad (11)$$

where D_r - daily wage rate, UAH;

D - the number of days worked by a worker in a year;

b) to calculate a worker's piecework earnings for the year (P_e):

$$C_3 = \frac{T_c}{H_{выр}} \times Q_{пр}, \quad (12)$$

where D_{or} - daily output rate, pcs;

Q_w - annual output of a worker, pcs.

From here it is possible to calculate the annual tariff wage separately for fulfilling labor norms by 100% and for exceeding norms.

Thus, the developed methodological approach to the quantitative assessment of the cost of human capital and labor potential using the methods of scientific labor rationing allows expressing labor norms in value form, which makes them comparable at different levels of economic management. The meaning of comparing the level of labor standards in value form with the actual element-by-element costs of human capital and labor potential is to be able to identify the proportions and trends of changes by years and elements of the analyzed categories, as well as to identify reserves for improving the efficiency of human capital and labor potential.

Conclusions

The analysis has established that human capital is a set of useful qualities and abilities of a living human organism to creative labor, inseparable from a person and capable of bringing him and society income. In market production it is an exponent of productive forces and production relations of society, so it has a value form of expression and a specifically labelled result. In the process of labor in combination with physical capital, it becomes a structural element of labor potential, its value substance.

The cumulative value of the cost of formation and development of human capital is determined by investments in three stages: pre-production, reproduction and innovation.

Quantitatively in the labor process, labor potential exceeds human capital by the value of the cost of means of production and energy resources for technological purposes. Therefore, the efficiency of the use of human capital and labor potential is assessed according to the principle of return on investment in human capital or labor potential by the main indicators: profitability of the use of these categories and capital efficiency.