

Current Trends in the Development of Reporting in the Sphere of Investments in Human Capital

Maryna Resler ^{1*}, Jurij Renkas ² and Ivan Rusyn ¹

¹ Faculty of Economics, Management and Engineering, Mukachevo State University, 26 Uzhhorodska Str., Mukachevo 89600, Ukraine;

² Department of Accounting, Faculty of Economics, Cracow University of Economics, 27 Rakowicka Str., Krakow 31-510, Poland;

Corresponding author*: e-mail: maryna.resler@ukr.net.

ABSTRACT: In the times of general digitalization, the issue of effective and reliable accounting of human resources is the most urgent for all enterprises, regardless of the form of ownership. In addition to investors who seek to understand the nature of the formation of added value, objective information about the contribution to the development of the common cause is also important for the employees themselves. The purpose of this work is to develop the company's financial reporting methodology in the context of evaluating the human and intellectual capital of the company's employees. By developing a separate calculation methodology based on traditional reports on added value, it is proposed to create one's own alternative human capital accounting system. In the process of work, a system of updated reporting on the level of payment of human capital of employees was developed, taking into account current needs and the possibility of ranking employees by category. Also, a visual algorithm of the process of forming an updated reporting form from primary documents to the corresponding result was created separately. In addition, in the work, the human capital index (HCI) for Poland was studied using the method of comparative analysis, which was compared with similar average indicators of Eurasian countries and the group of developed countries with a high level of income. The practical significance of the work lies in the creation of a practical working document, thanks to which companies will be able to form transparent reports in the context of the use of human capital, which will help, on the one hand, better understand the principles of profit formation for investors and business owners, and on the other hand, remove possible misunderstandings regarding the principles of accrual workers a fair wage.

Keywords: Added value, information technology, accounting, labour market, personal resource.

I. INTRODUCTION

In the conditions of building an innovative model of development of individual countries and strengthening the globalization of such processes, the problem of investing in human capital and its effective use is becoming more and more relevant. At the same time, the rapid development of information technologies creates additional requirements for the display of this important parameter in reporting. Since it is human capital that is the most promising direction of development, qualitative accounting will allow monitoring the influence of this factor and obtain a predictable and long-lasting socio-economic effect in the future. This problem was already studied by M. G. Wozniak [1], who considered the development of human capital in Poland from the point of view of integrated development. Having identified the shortcomings of the reforms carried out in the knowledge sector in Poland since 1990, the author studied various aspects of the approach and came to the conclusion that the modernization of human capital consists in the effective harmonization of development goals in all spheres of human activity.

The important issue of regional differences in the formation of human capital was investigated by M. Wielechowski et al. [2]. Having identified four clusters in different voivodeships of Poland, which differed significantly in terms of the level of human capital determinants and the average level of gross domestic product (GDP) per capita, the authors found a positive and significant relationship between GDP per capita and life expectancy, the level of higher education, the level of economic activity and access to the Internet. Having thus determined the regions most in need of stimulation of the determinants of human capital, the authors had the opportunity to develop targeted innovative projects and contribute to the growth of regional economic

development. Other important problems that have been studied within the framework of theories of investment in people are the issue of training, which is related to the improvement of professional qualifications, as well as migration processes in order to find better conditions for life and work.

In their study of these processes as a regulator of labour supply and demand, W. Janicki and V. Ledwith [3] considered the phenomenon of replacement migration in peripheral regions to compensate for the loss of human capital. The analysis, which focuses on Eastern Poland and includes data from Ukrainian migrants, Polish emigrants and Polish nationals, suggests that Ukrainian migrant workers have the potential to provide “substitute” work, compensating for Poland’s loss of human capital associated with the migration of Polish citizens to Germany. As for the citizens of Ukraine, whose influence on Poland’s human capital market increased manifold with the start of a full-scale war in February 2022, O. Brintseva [4] conducted a study of the effectiveness of investments in people based on a comparative analysis of Poland and Ukraine. The results indicated the low efficiency of human capital in Ukraine, which the author associates, firstly, with the negative economic situation in the country and relatively low state spending on education and health care. However, the work makes an optimistic conclusion that the implementation of Polish experience can increase the efficiency of investments in human capital in Ukraine.

The research gap that this study addresses lies in the lack of an integrated and comprehensive reporting model for human capital that effectively incorporates both intellectual and human capital measures. While previous studies have explored various aspects of human capital development, regional disparities, migration impacts, and the influence of education and the COVID-19 pandemic on labor markets, they have not sufficiently developed a systematic approach to human capital reporting. This study fills this gap by proposing a new model for human capital reporting that enhances transparency and informativeness for stakeholders, ultimately improving the quality of human capital investment decisions and aligning them with broader economic and social goals.

This study makes significant contributions by developing a pioneering framework that integrates traditional financial reporting with novel metrics of intellectual and human capital. These contributions enhance transparency and strategic decision-making in organizational management, providing a comprehensive approach to evaluating and reporting human capital.

The aim of this work is to investigate scientific approaches in the field of human capital, to provide an assessment of reporting options for its accounting, and to propose an own model of report formation. Specifically, this study aims to answer the following research questions:

1. How can the existing reporting systems be adapted to better account for human capital in a way that meets the expectations of both investors and company employees?
2. What are the potential impacts and challenges of implementing a new form of human capital reporting on the company's competitive advantage and overall market performance?

Objectives were set to develop an improved methodology for reporting on human capital investments that enhances transparency and informativeness for both investors and employees; to create a practical model for calculating and reporting the value of human capital at both individual employee and company-wide levels; to analyze the current state of human capital development in Poland using the Human Capital Index (HCI) and compare it to regional and economic peer groups. The hypothesis made by the author was that the implementation of a more comprehensive and transparent human capital reporting system will lead to improved allocation of resources and investment decisions related to human capital development within companies and better alignment between company human capital investments and broader economic and social development goals at national and regional levels. The contributions of this study consist in the following:

- proposal of a new, more comprehensive reporting format for human capital that integrates traditional financial reporting with measures of intellectual and human capital;
- development of a practical calculation methodology and report structure for assessing individual employee human capital value and company-wide human capital assets;
- creation of a visual process flow for generating the proposed human capital reports from primary documents to final output;
- analysis of Poland's current Human Capital Index metrics in comparison to Eurasian and high-income country averages, providing context for the importance of improved human capital reporting.

II. LITERATURE REVIEW

One of the greatest merits of the theories that dealt with the problems of investing in a person was to clarify the issue of education that was acquired additionally, that is, it was not universally mandatory. Research by G. Chaberek and J. Ziolkowska [5] on the example of Gdansk showed that students show a demand for education in periods of high unemployment, and although they are well aware of the amount of “lost” wages, on the other hand, they have expectations of an increase in income upon return to the labour market by more qualified specialists. Finally, the COVID-19 pandemic in 2020-2022 had a noticeable impact on the processes of reporting and calculating

labour costs. K. Piwowar-Sulej et al. [6] examined twelve detailed practices of sustainable development of human resources before and during the pandemic in various organizations in Poland and found that most companies in the post-pandemic period began to rate their employees more highly. Thus, M. Blaug [9] argued that the basis of investment theory is the idea that people spend money not only on current needs and pleasures, but also think about future profits, both monetary and non-monetary. Such expenses are perceived in society as investments in oneself and, accordingly, a reasonable rate of return is expected. Since these actions are aimed at development, a person refused to use certain opportunities and resources “here and now” for a greater economic effect in the future. This phenomenon of self-investment soon spread to such economic entities as families, where it received new areas for expansion, because the household is the place of formation “from scratch” of individual human capital for children born in the family [10, 11].

However, at these stages, it was customary to concentrate only on the very principles of the formation of the value of human resources, ignoring the possibilities of accounting for this specific resource highlighted in this work. According to the observations of T. W. Rimerman [12] and E. L. Jenkins [13], financial reporting in the early 1990s no longer fulfilled its main purpose and, for example, assets that actually created value for shareholders were not properly recorded in the financial accounting system. Such inconsistencies were due to the conservatism of accounting standards that did not keep up with changes in the economy and business, and therefore there was a demand for changes in the human capital market. Empirical studies by D. W. Collins et al. [14] also confirmed the tendency to decrease the practicality of the information disclosed in financial statements and the decrease in the usefulness of the information about the profit used to establish the value of the company. The reason for this, as the authors saw, is that the information contained in the balance sheet makes it possible to better predict the company’s income, while the profit and loss statement contains many contradictory elements, such as information about the projects not implemented by the company [15, 16].

III. MATERIAL AND METHOD

1. RESEARCH DESIGN

The research design involves developing a new independent report on the level of payment of human capital by integrating traditional financial reporting with an evaluation methodology for intellectual and human capital, utilizing both theoretical and practical data analysis to assess the effectiveness and implications of the proposed reporting model. When developing an effective method of evaluating and accounting for human capital, the report on added value played an important role. However, its informativeness did not make it possible to evaluate the main important indicators related to the level of payment of individual human capital of the company’s employees, which became the reason for the development of a new independent report on the level of payment of human capital and the methodology of its filling. To fully define the terminology, it is worth noting that accounting is a part of the technology that helps to identify effective contracts and agreements that change over time, and the accounting data provided by this system is also used to evaluate the performance of management based on performance indicators. Accordingly, the goal of accounting is to provide information about the funds transferred to the economic entity by various entities and about the ways of their use. In order not to lose the advantages of traditional financial reporting, it is worth using the methodology of creating a separate, additional reporting system dedicated to the accounting of human capital, which will be responsible for the practical areas of using financial information. The method of creating such alternative reporting involves the selection of information according to the following categories:

- information related to the enterprise;
- management analysis;
- information related to the future;
- information relating to management and shareholders;
- information about unmeasured elements.

2. VARIABLES AND MEASURES

Adherence to these rules and disclosure of the necessary reliable information will affect the improvement of relations with investors, the likelihood of making more appropriate investment decisions, reduce the risk of lawsuits related to incorrect disclosure of information, and provide additional opportunities for protection in case of their occurrence. Since the differences between the accounting and market value of employees are increasing in the market, it is worth using the calculation of the rate of return on intellectual capital according to the formula of D. Dobija [7]:

$$v = \frac{W - H(T) \times a}{I(T)} + a \quad (1)$$

where W is real labour costs (total amount of wages); $H(T)$ is the total cost of human capital; $I(T)$ is the value of intellectual capital; a is the rate of return at average risk (8%).

3. DATA COLLECTION

Data were gathered from various primary sources within companies, including:

- employment contracts (detailed information on the roles, responsibilities, and compensation of employees);
- personal cards of employees (education, experience, and qualifications);
- accounting tables (the working hours of employees);
- settlement and payment statements (documents reflecting the financial transactions related to employee compensation);
- accounting registers and the general ledger (data on the financial status of the company, assets, liabilities, and overall capital).

4. INTEGRATION OF TRADITIONAL FINANCIAL REPORTING WITH HUMAN CAPITAL MEASURES

To develop a new form of reporting, it was decided to use the concept of intellectual capital in its interpretation as a component of an employee's human capital. The form of the report on added value, which integrates data from the report on financial results and raw data on the human and intellectual capital of the company's employees, is shown in Table 1.

Table 1. Form of report on added value [7]

Part 1. Distribution of added value		
I	Income from sales	currency
II	Purchased materials and services	currency
III	Added value	currency
The added value is distributed as follows:		
1.	Payments to employees	currency
1.1.	Salary expenses:	currency
1.1.1.	Standard labour cost	currency
1.1.2.	Labour costs of intellectual capital	currency
1.1.3.	Deduction for social needs	currency
2.	Payments to capital owners	currency
2.1.	Percentages	currency
2.2.	Dividends for shareholders	currency
3.	Calculations based on accrued taxes	currency
3.1.	Obligations for settlements with the state	currency
4.	Fund for maintenance and investment in fixed assets	currency
4.1.	Amortization	currency
4.2.	Undivided profit	currency
Part 2. Distribution of added value between employees		
A.	Labour cost of workers	currency
A1.	Intellectual capital	currency
A2.	Total value of human capital	currency
A3.	Rate of return on intellectual capital	%
A4.	Rate of return on human capital	%
B.	Management's labour costs	currency
B1.	Intellectual capital	currency
B2.	Total value of human capital	currency
B3.	Rate of return on intellectual capital	%
B4.	Rate of return on human capital	%
C.	Indicator of profitability of human capital of employees	%

Thus, on the basis of the report on added value, the principles of data calculation were formed for a new form of report on the level of payment of human capital of employees, which naturally complemented the financial reporting of the enterprise. The synthetic model of the evaluation of the individual human capital of an employee allows organizing a system of registration and processing of data on the human capital of an individual employee and the level of his payment, which is superimposed on the concept of the report on added value. Thus, on the basis of the developed materials, it is possible to calculate the value of both the individual human capital of each employee of the company, and the total size of this indicator for the company. In addition, the current key indicators of the HCI in Poland were investigated, and a comparative analysis was carried out with similar average statistical indicators for the Eurasian region, as well as for high-income countries.

5. CONCEPTUAL FRAMEWORK

The conceptual framework for this study is built upon the integration of traditional financial accounting with human capital accounting to develop a comprehensive reporting model that reflects the true value of human capital within a company Figure 1. This framework posits that by incorporating detailed measures of human and intellectual capital into financial reports, companies can provide more transparent and informative data to stakeholders, thereby improving investment decisions and employee satisfaction. The underlying hypothesis is that enhanced reporting on human capital will bridge the information gap between management and employees, leading to better resource allocation, reduced investment costs, and more favorable market conditions. Additionally, the framework suggests that while increased transparency can pose risks related to the disclosure of sensitive information, these can be mitigated through strategic reporting practices that balance informativeness with confidentiality. The study proposes that such an integrated reporting model not only supports the social market economy by acknowledging the contributions of human resources but also aligns with modern accounting practices that emphasize the importance of intellectual capital.

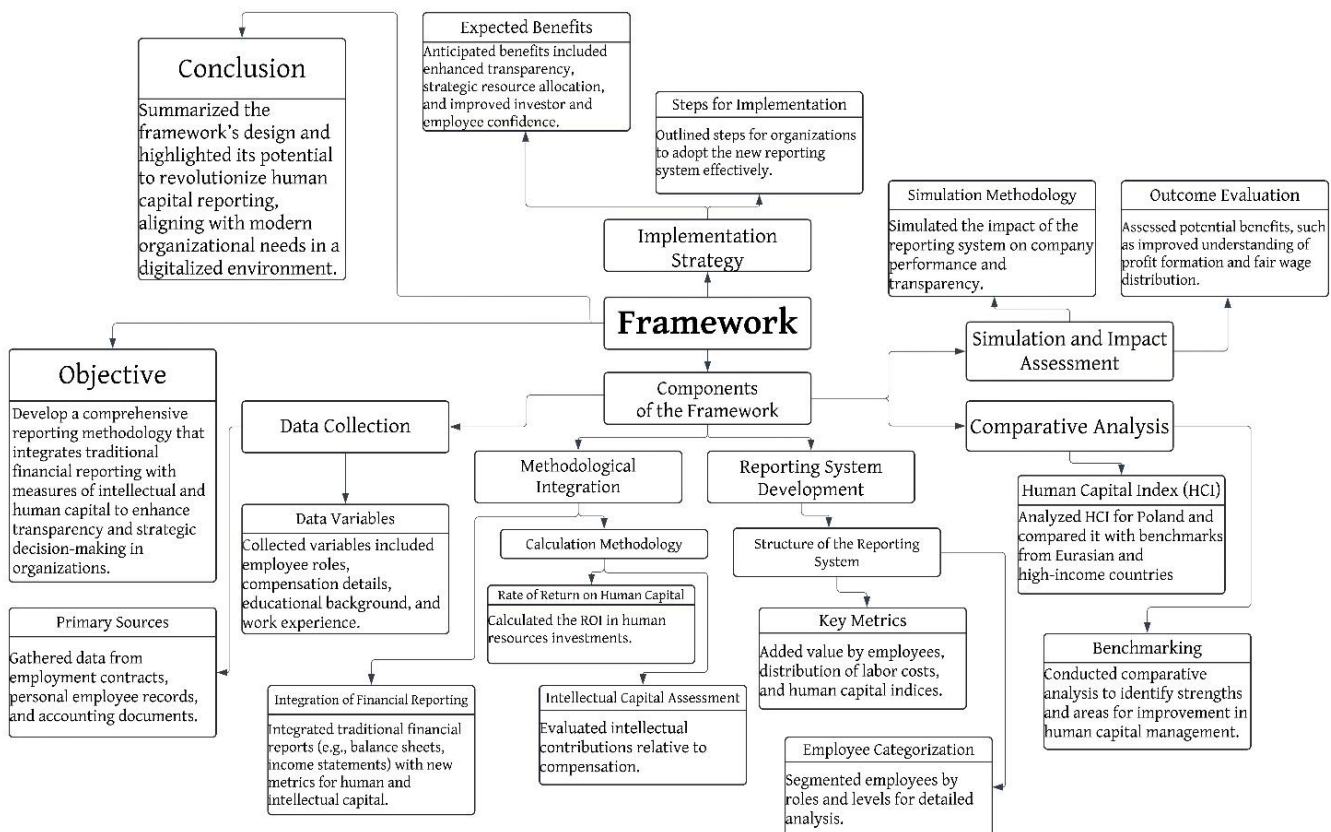


FIGURE 1. Framework for proposed methodology

IV. RESULT AND ANALYSIS

Turning to the proposal for a new form of reporting in the field of human capital and equivalent wages, it should be emphasized that at the moment, accounting theory and practice are approaching a turning point, when reporting

is less and less meeting the expectations of both investors and company employees. Employees' awareness of general accounting information issues has never been sufficient, but at this historical stage, the development of their education already allows them to demand access to such issues. Reducing the asymmetry in access to information between management and various agents of the company will ultimately lead to a better allocation of capital, a reduction in the cost of investment, and the emergence of more favourable markets. At the same time, it is worth understanding that disclosure of certain internal information in reports will increase the threat of leaking confidential information, which will negatively affect the company's competitiveness. Open data on, for example, profit margins and input prices can lead to a revision of their pricing by competitors or suppliers and can cause the cancellation of existing contracts. In order to minimize such threats, the company's management should define in advance the level of detail and the time frame in the coverage of additional information containing information about competitive advantages. Since the specialization of different enterprises is significantly different and the disclosure of the same data can be extremely dangerous for one company and almost insignificant for another, in each specific case it is necessary to make a decision based on the current status and operating conditions of the business entity.

However, the volume of information covered in the report should not become a negative factor, especially given that competitors quite often receive important data from former employees, joint suppliers, customers, as well as from marketing research and market news. Information that could potentially harm a successful company should be presented in moderation, in order, on the one hand, to provide the necessary useful information to users, and, on the other hand, not to create obstacles to development. For example, companies can disclose information to their own employees under conditions of confidentiality with declared liability of the parties in case of violation of such conditions. In addition, if the employee receives only information about his own contribution to the joint venture, he will not have an idea of the general picture of the capitalization of the enterprise and, accordingly, will not be able to cause harm by transferring this information to competitors – intentionally or unintentionally.

Such a personal approach to each carrier of human capital and the very phenomenon of the new information economy poses new challenges to reporting and the accounting system. Accordingly, in the modern reporting system, all important values that have an impact on the economic life of the business entity and which should be measured using an improved accounting system should be identified. These values are related to the company's human resources, which have not yet been a clear object of study in accounting science. Human resources, being included in the theory and practice of accounting, give it a wider social character. At the same time, returning to the phenomenon of intellectual capital, it should be noted that this concept can be considered both from the point of view of an enterprise and from the point of view of an individual employee. From the point of view of the enterprise, this value is a more general concept defined as the intellectual capital of the enterprise and which includes the human capital of employees. From the point of view of an individual employee, this value is a component of human capital and is determined by its two parameters: the capital of professional education and experience. It is this interpretation of intellectual capital as a component of an employee's human capital that should be used to develop a new form of reporting. Using the above formula 1, it is necessary to determine the rates of profit on human and intellectual capital. Calculation data are given in Table 2.

Table 2. Rates of return on human and intellectual capital [7]

No.	The total amount of capital	
1	Total value of human capital (H(T)), monetary unit	1,920,504.99
2	Minimum profit rate (a)	8%
3	Normative labour costs (H(T)*a), monetary unit	153,640.4
4	Real labour costs (W), monetary unit	345,000
5	The sum of the difference (W-H(T)*a), monetary unit	191,359.6
6	Real rate of return on human capital	18%
Intellectual capital		
7	Cost of intellectual capital (I(T)), monetary unit	502,493.63
8	Real labour costs (W), monetary unit	345,000
9	Profitability of intellectual capital	46.08%

For the correct display of data in the financial statements, it is also worth calculating the total value of the company's assets, including human assets Table 3.

Table 3. Initial data for establishing the total value of the company's assets

Indicator	Sum
Number of employees, people including:	3
– employees of the 1st category, person	1
– employees of the 2nd category, person	2
The cost of human capital, calculated on the basis of capitalized maintenance costs (K), monetary unit	1,270,014
Vocational education (VE) capital €, monetary unit	71,830
Capital experience (D(T)), monetary unit	312,130
Tangible assets of the enterprise, monetary unit	1,800,000
Intangible assets of the enterprise, monetary unit	860,000
The total amount of accrued wages (labour costs), monetary unit, including:	167,100
– amount of premiums, monetary unit	30,000

It is obvious that when hiring employees, the owner of the company is not trying to buy them into ownership in the usual sense, but is buying their ability to perform a certain job. Accordingly, he pays wages as a reward for the workers putting their capital at the disposal of the company. Therefore, the phrase "human assets" should be understood as the generalized value of human capital, which consists of individual capitals of the company's employees. These employees use their ability to effectively perform certain official duties and transfer it to the disposal of the employer, counting, in turn, on a stipulated reward that is equivalent to the efforts made. The efficiency of the enterprise depends on these human resources, and they are decisive in the competitive struggle. Accordingly, the structure of the company's assets, taking into account the above indicators, will have the following form Table 4.

Table 4. Structure of the company's assets

Structure of human capital		
1	The value of human capital, calculated on the basis of capitalized maintenance costs (K) – physical human capital, monetary unit	1,270,014
2	VE capital (E), monetary unit	71,830
3	Capital experience (D(T)), monetary unit	312,130
4	Total value of human capital, monetary unit	1,653,974
The structure of the company's assets		
5	Tangible assets of the enterprise, monetary unit	1,800,000
6	Intangible assets of the enterprise, monetary unit	860,000
7	Human capital of the enterprise, monetary unit	1,653,974
8	Total amount of assets, monetary unit	4,313,974

According to the indicators and accrual principles given in Table 4, it becomes possible to separate assets of different origins and make a comparative analysis between human, material and immaterial sources of capitalization. Thus, using such a structure in accounting, it is possible to satisfy informational needs in the field of human capital and the level of its payment, both from the point of view of awareness of specific employees of the company, and from the point of view of other users of financial statements. The structure of such a report is built

taking into account the tariff grid of the enterprise, which is the basis for regulating the professional and qualification division of employees and, accordingly, it allows analysing the value and profitability of the human capital of employees in terms of their qualification categories. Table 5 shows an example of filling out this report form at the end of the reporting period by an enterprise that uses a tariff grid with two qualification levels in its activities, while using the original data from Table 3 and Table 4.

Table 5. An example of filling out a report on the level of payment of human capital of employees

Item	Indicator	At the beginning of the reporting period	At the end of the reporting period
I. The structure and profit rate of the human capital of the company's employees			
1.1.	Human capital of company employees	—	1,653,974
1.2.	Intellectual capital of employees	—	383,96
1.3.	Experience capital	—	312,13
1.4.	Standard labour costs (clause 1.1*0.08)	—	132,317.92
1.5.	Basic salary	—	137,100
1.6.	The amount of the difference (items 1.5-1.4)	—	4,782.08
1.7.	Percentage of compliance (item 1.5/item 1.1*100%)	—	8.3%
1.8.	The size of the bonus	—	30,000
1.9.	The total amount of wages (clause 1.5+clause 1.8)	—	167,100
1.10.	Real level of remuneration (clause 1.9/closure 1.1*100%)	—	10.1%
II. The structure and rate of profitability of the human capital of employees of the 1st category			
2.1.	Human capital of employees of the 1st category	—	748,560
2.2.	Intellectual capital of employees of the first category	—	215,900
2.3.	Experience capital of the first category employees	—	142,770
2.4.	Normative labour costs (clause 2.1*0.08)	—	59,884
2.5.	Basic salary	—	61,000
2.6.	The amount of the difference (clauses 2.5-2.4)	—	1,115.2
2.7.	Percentage of compliance (item 2.5/item 2.1*100%)	—	8.2%
2.8.	The size of the bonus	—	14,000
2.9.	The total amount of wages (clause 2.5+clause 2.8)	—	75,000
2.10.	Real level of reward (clause 2.9/closure 2.1*100%)	—	10%
III. The structure and profitability of the human capital of employees of the 2nd category			
3.1.	Human capital of employees of the second category	—	905,414
3.2.	Intellectual capital of employees of the second category	—	168,060
3.3.	Experience capital of employees of the second category	—	112,360
3.4.	Standard labour costs (clause 3.1*0.08)	—	72,433.12
3.5.	Basic salary	—	76,100
3.6.	The amount of the difference (clauses 3.5-3.4)	—	3,666.88
3.7.	Percentage of compliance (item 3.5/item 3.1*100%)	—	8.4%
3.8.	The size of the bonus s	—	16,000
3.9.	The total amount of wages (clause 3.5+clause 3.8)	—	92,100
3.10.	Real level of reward (clause 3.9/closure 3.1*100%)	—	10.2%

As can be seen from the calculations above, the level of remuneration for the enterprise as a whole is a little more than ten percent of the total cost of capital of the employees. If paying attention to the indicators of the real level of remuneration for the two categories of workers, it is worth noting that in both cases, the worker has the opportunity to compensate for the natural dispersion of his capital, which, according to the theory of constant growth, is about 8%. The rest of the remuneration, which is from 2% to 2.2%, depending on the category, can be used by the employee for personal development. Access to such a detailed report format gives employees the opportunity to analyse their individual contribution to the common cause in the form of their own human capital and draw conclusions about their effectiveness and the appropriateness of the remuneration received. The proposed form of reporting takes into account such alternative sources of data as, for example, personal files of employees and information about their education. This favourably distinguishes the individual approach to data accounting and emphasizes the lack of possibility of obtaining such data during the analysis of individual articles of other forms of reporting. Thus, the structure of this alternative report covers important information related to the relationship between the company and its employees. The entire process of forming the above reporting form from the primary documents to the corresponding report is presented in Figure 2.

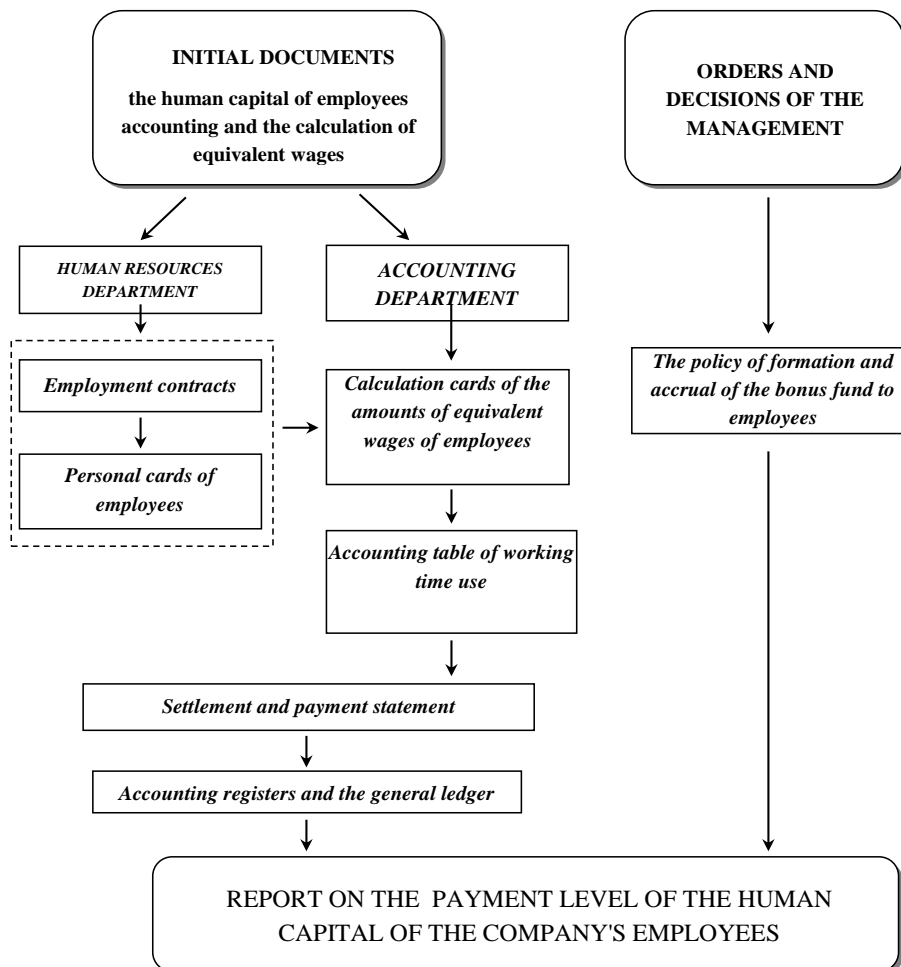


FIGURE 2. The scheme of forming a report on the level of payment of the human capital of the company's employees

The introduction of this form of reporting will satisfy the current goals of financial accounting, as it should eliminate the information gap that has existed for decades between business owners and employees. On the other hand, it allows interested specialists of the company, such as accountants, employees of the personnel department, to timely receive complete information about the intellectual capital of individual employees, their experience, education. Since the capitalist approach, in the positive sense of the word, involves accounting and taking into account all types of capital that participate in the creation of additional value, as well as equal rights to its

preservation and multiplication, then the reporting, supplemented with such information, is a manifestation of the social market economy, on in contrast to closed accounting, which is aimed only at the interests of the owners.

In the context of the proposed method of calculating the value of human capital, it will be appropriate to examine the current state of affairs with the HCI in Poland as of October 2022. According to the terminology of The World Bank [8], human development index (HDI) measures the amount of human capital that a child born today can expect to reach 18 years of age and conveys the productivity of the next generation of workers compared to the benchmark of full education and full health. Accordingly, a child born in Poland just before the COVID-19 pandemic will be 75% more productive when they grow up, compared to today’s adults. This is higher than the average for the Eurasian region (69%) and developed high-income countries (71%). As of 2022, the HCI for Poland was formed from the following factors:

- the probability of a newborn child in Poland surviving to 5 years is 100%;
- a child who starts school at the age of 4 can expect to complete 13.4 years of school by his 18th birthday;
- students in Poland scored 530 points on the scale, where 625 is the maximum achievement and 300 is the minimum achievement;
- taking into account the actual level of education, the expected duration of general education is only 11.4 years;
- the survival rate of adults is 89%, that is, 89 out of every hundred fifteen-year-old children will live to be at least 60 years old;

In more detail, the key indicators of HCI are given in Table 6.

Table 6. Key parameters of the HCI for Poland in 2022 [8]

Components of HCI	Guys	Girls	In total
IHC general	0.72	0.79	0.75
Survival up to 5 years	1	1	1
Expected school years	13.4	13.5	13.4
Harmonized results of student tests	525	535	530
School years with adaptation in mind	11.2	11.5	11.4
Adult survival rate	0.85	0.94	0.89

Since human capital is an important component of economic growth that accumulates throughout a person’s life cycle, it is worth considering a set of additional indicators that offer an instant “screenshot” of the approximate size of human capital. Such parameters, which can be monitored to measure operational progress in intermediate results, are based on the latest available data and can be compared with averages of a regional (Eurasia) and economic (scope of high-income countries) nature. They highlight where there is a need for investment in people at each stage of their lives, and also serve to collect and update data to adjust public policy. For Poland, these operational indicators have the following form.

1. The period of early childhood
 - neonatal mortality; makes three cases per 1000 live births; this is a lower indicator than in the Eurasian region (4) and the group of high-income countries (4);
 - preschool enrolment is 93%, higher than both control groups;
 - maternal mortality – for every 100,000 live births, 2 women in Poland die from pregnancy-related causes; this indicator is lower than the average indicator both for the region (8) and for the economic group (9).
2. Period of school age
 - completion of primary school – 95% of students, which is lower than both the regional indicator (98%) and the indicator of countries with high incomes – 99% on average;
 - the overall rate of secondary education coverage is 112%, which is higher than in the two control groups – 107% and 110%, respectively.
 - difficulties – 6 percent of 10-year-olds in Poland cannot read and understand simple text by the end of primary school, compared to 11% regionally and 14% in high-income groups.
3. Youth
 - the fertility rate is 9 cases per 1,000 teenagers aged 15-19, which is lower than in both comparison groups – 15 and 13 cases, respectively;

- coverage of higher education – 69% – is equal to the regional level, but lower than the indicator of countries with a high level of income (70%);
 - youth unemployment is 11%; at the same time, in the control groups – 18% and 15%.
4. Adults and elderly people
- the share of women in the labour force in Poland is 51%, which is lower than both the regional (54%) and economic (55%) indicators;
 - life expectancy at birth is 77 years for Poland, which is lower than both the regional figure (78 years) and the figure by income group (80 years) on average.

Thus, understanding the current state of affairs with human capital in Poland, as well as being able to compare them with regional indicators, it is worth adopting an updated method of reporting in order to be able to monitor the development of indicators in the near future.

V. DISCUSSION

Analysing the results of this work, it is worth paying attention to the historical research background of the existing processes, because the development of reporting in the field of investments in human capital was formed over decades. In the process of searching for a systematic solution to the problem of practical assessment of human capital, in the work of A. G. Hopwood [17] a significant step in the right direction was taken by establishing value added reporting. It was she who started the practical course aimed at substantiating system information and conveying it to employees. Thanks to the information on participation in the formation of added value, the company's employees could evaluate their own contribution to the common cause, and the reporting information made it possible to compare this data – both with other time periods of the same company, and in the same period between different firms [18-21].

This approach also corresponded to the proposal of S. M. H. Wallman [22], who presented a model of a new "colour accounting", which involved not a complete replacement, but the addition of the old "black and white" accounting with information in the form of different levels of financial reporting. The first level of this reporting had to take into account elements that are currently reflected in traditional financial statements. The second level of reporting would include items that are clearly important assets of the firm, but due to the difficulties associated with establishing their value, are not reflected in the current financial statements. In particular, advertising costs, brand value and costs incurred to improve customer comfort and satisfaction [23, 24]. According to author, the third level of reporting should contain elements whose definition may cause doubts, such as the actual level of consumer satisfaction. The fourth level of information covers issues of risk and vulnerability analysis, which do not cause doubts about their definition and do not create problems with their measurement, but have difficulties with reflection in financial statements [25, 26]. The last, fifth level of the colour spectrum should contain elements that, at the current level of knowledge, are problematic from the point of view of their measurement (for example, intellectual capital, value of human capital of employees, company value). An important feature of the proposed system is the preservation of relevant and useful information for investors and, at the same time, the availability of additional information, which allows for a more flexible presentation of the company's multi-level environment and its dynamic nature [27, 26].

J. Francis and K. Schipper [28], in their work, saw the reporting error both in the growing value of intellectual value, which has not yet been taken into account, and in the obstacles associated with adapting changes to a dynamic technological environment. In their opinion, the expenses and losses reflected in the financial statements are not the result, but a symptom of the decline in the value of the profit indicator, which is used to predict the future value of the company [29, 30]. Based on the results of the study, the authors advised to make changes in the field of reporting information and to systematically modify financial statements so that they reflect changes in previously presented probable events, the probability of which has changed. In the search for a more perfect human resources accounting system, which is the subject of this work, A. R. Abdel-Khalik [31] also proposed introducing two reporting systems. Since current standards defined fair value as the market price at which an asset can be sold or a liability settled in the ordinary course of business, the question of measuring the so-called historical value remained aside. Knowing only the fair value did not help investors to evaluate the management, because they did not know how many resources the management sacrificed to obtain this fair value [32], and therefore the author proposed to introduce an index of the quality of management, similar to the rate of return, which took into account both parameters.

However, as it was found out in the course of this study, the use of the formula of added value is incorrect in the formation of human capital accounting, and therefore original sources of initial data were needed for this. According to the new research program proposed by M. Dobija [33], human capital, labor and equivalent wages form an inseparable triad, where capital is transferred to objects of work. In the framework of these studies, on the one hand, capital is interpreted as an abstract category, and on the other hand, according to the principle of dualism,

capital is embodied in tangible and intangible assets, such as, for example, the ability to perform work [34-36]. Another approach to the methodology of evaluating human capital was proposed by N. Pravdiuk et al. [37]. Taking into account that from the point of view of accounting, the most valuable model of human capital assets is the most optimal, the authors proposed a method of estimating the human capital of an enterprise based on costs, according to which the value of human capital assets is calculated by capitalizing the costs incurred by the employee and the enterprise at all stages of formation and development of human capital assets [38-40].

F. Nurmahmudah and E. C. S. Putra [41] conducted a study aimed at studying the productivity of employees who invested in their own education on the example of 255 non-academic employees of a university and using a mismatch model proved that people who increased their own human capital through education also increased productivity. Evaluation of human capital in science-oriented organizations based on big data analysis was conducted by S. S. Nicolaescu et al. [42] by developing a flexible software tool that collects data from organizations automatically and generates multiple results measuring and assigning employee performance. However, compared to the solution proposed by the authors of this work, it is too complex and can only be used by representatives of the IT industry [43]. Finally, T. Hilorme et al. [44] proposed their method of evaluating human capital, based on calculations of project life cycle indicators and the cost of a delayed decision, and justified the choice of a human capital accounting model depending on the scope of authority and responsibility of managers. Comparing the new alternative calculation methods listed above with the results of this work, it is worth noting such common features as pragmatism and a modern approach to solving the problem. However, the methodology proposed in this study is more universal and simpler.

VI. CONCLUSION

The idea of a simple and clear report that contains all the necessary information about investments in human capital, but does not contain unnecessary information, is getting a complete look in our time. The general level of education in society contributes to the fact that a worker of any qualification can understand his own contribution to the development and profitability of the employer's company and receive additional motivation for self-development and improvement of the common cause. Since every accountant at the enterprise has access to the information that is used to form a report on the level of payment of human capital of individual employees, the only obstacle to the formation of a full accounting of these resources remained only the lack of the ability to quickly determine the amount of personal contribution of each individual worker. However, the concept of accounting for equivalent wages presented in this study will solve this problem by providing a tool that will make it possible to quickly assess the components of human capital, as well as the time spent on work by each individual representative of the workforce. In addition, the proposed methodology takes into account the corresponding level of productivity and qualification of each individual employee.

Having obtained the current indicators of the HCI for Poland as a result of this study and having clarified the factors that shape it – both long-term and operational – it is worth considering the possibility of applying an updated approach to accounting for human capital from the point of view of further dynamics. By implementing updated reporting on human capital investment calculations for a specific company at this stage, it will be possible to perform subsequent measurements after a certain period. Comparing these results with the updated HCI indicators will allow for drawing conclusions about the development trends of national indicators in Poland. Such a study, utilizing the data and methods derived from this work, could serve as the foundation for future research on human capital accounting.

The implications of this study are multifaceted, potentially transforming the landscape of financial reporting and human resource management. By introducing a more comprehensive and transparent method of human capital accounting, this research could significantly impact how organizations value, invest in, and manage their workforce. For businesses, the proposed reporting model offers a tool to better understand and leverage their human capital assets, potentially leading to more strategic decision-making in areas such as talent acquisition, development, and retention. Investors and stakeholders may benefit from a more accurate picture of a company's true value, including previously under-reported human capital assets, which could influence investment strategies and market valuations. From an employee perspective, this new approach to reporting could foster greater engagement and motivation by providing clear recognition of individual contributions to organizational value. On a broader scale, the adoption of such reporting practices could contribute to more equitable labor markets and informed policy-making, as it provides a more nuanced understanding of human capital at both organizational and national levels. While this study provides valuable insights into integrating human capital metrics with traditional financial reporting, it has several limitations. Firstly, the framework's applicability may vary across different industries and organizational sizes. Additionally, the methodology relies on the availability and accuracy of data from company records, which may affect the consistency and generalizability of the results. Further research is needed to validate the framework in diverse contexts and to address these limitations.

Funding statement

The authors wish to acknowledge that no specific funding or support was provided for this study.

Author contribution

Maryna Resler, Jurij Renkas, and Ivan Rusyn contributed to the initial drafting of the paper. Jurij Renkas, and Ivan Rusyn reviewed and edited the manuscript.

Conflict of Interest

The authors declare no conflict of interest.

Data Availability Statement

Data are available from the authors upon request.

Acknowledgements

The authors would like to acknowledge assistance of the Editor and Reviewers in the preparation of the article for publication.

REFERENCES

1. Wozniak, M. G. (2020). A new institutional orientation of the development of science, knowledge and human capital in Poland versus integrated development. *Social Inequalities and Economic Growth*, 63, 113-140.
2. Wielechowski, M., Cherevyk, D., Czech, K., Kotyza, P., Grzeda, L., & Smutka, L. (2021). Interdependence between human capital determinants and economic development: K-means regional clustering approach for Czechia and Poland. *Entrepreneurial Business and Economics Review*, 4, 173-194.
3. Janicki, W., & Ledwith, V. (2021). Replacement migration on the edge of the European Union: Wasting human capital? *International Migration*, 60(3), 72-87.
4. Brintseva, O. (2023). The effectiveness of investment in human capital in Poland and Ukraine: Directions for growth based on comparative analysis. *Scientific Journal of the Krakow University of Economics*, 1(999), 31-46.
5. Chaberek, G., & Ziolkowska, J. (2022). City corporation activities for creating sustainable population development in the opinion of university students in Gdansk (Poland). *Sustainability*, 14(18), 11781.
6. Piwowar-Sulej, K., Malik, S., Shobande, O. A., Singh, S., & Dagar, V. (2023). A contribution to sustainable human resource development in the era of the COVID-19 pandemic. *Journal of Business Ethics*.
7. Dobija, D. (2004). *Measurement and reporting of the company's intellectual capital*. Warsaw: Wydawnictwo Wyższej Szkoły Przedsiębiorczości i Zarządzania.
8. The World Bank. (2020). *The human capital index*. <https://www.worldbank.org/en/publication/human-capital>
9. Blaug, M. (1992). *The methodology of economics or how economists explain*. Cambridge: Cambridge University Press.
10. Berdykulova, G., Niyazgulova, A., & Ibragimov, N. (2019). Social media in education: Experience of Kazakhstani university. *International Journal of Engineering and Advanced Technology*, 8(2), 305-311.
11. Komilova, N., Kuldashaeva, M., Egamberdieva, M., Safarova, N., & Altibaeva, M. (2023). Mechanisms for improving the teaching of economic and social geography. *Economic Affairs*, 68, 789-795.
12. Rimerman, T. W. (1990). The changing significance of financial statements. *Journal of Accountancy*. <https://www.thefreelibrary.com/The%20changing%20significance%20of%20financial%20statements.-a08370490>
13. Jenkins, E. L. (1994). An information highway in need of capital improvements. *Journal of Accountancy*, 4, 31-41.
14. Collins, D. W., Maydew, E. L., & Weiss, I. S. (1997). Changes in the value-relevance of earnings and equity book values over the past forty years. *Journal of Accounting and Economics*, 24(1), 39-67.
15. Jain, R., Husain, A., Jussibaliyeva, A., Khassenova, K., Shamisheva, N., & Sagindykova, G. (2022). A new hybrid algorithm for the resource constraint project scheduling problem. *Industrial Engineering and Management Systems*, 21(3), 492-502.
16. Makhnitskaya, E. I., & Shalbolova, U. Z. (2012). Regional model of investment innovative processes development. *Actual Problems of Economics*, 133(7), 414-426.
17. Hopwood, A. G. (1994). *Accounting as social and institutional practice*. Cambridge: Cambridge University Press.
18. Tomashevski, K., & Yaroshenko, O. (2020). Problems of labour legislation codification in Belarus and Ukraine: History, current situation and prospects. *Transition Studies Review*, 27(2), 41-49.
19. Paulikas, J., & Paulikiene, B. (2022). Impact of the communicated information content on employee resistance to change. *Insights into Regional Development*, 4(3), 61-75.
20. Makhatova, N., Bakirbekova, A., Dogalov, A., Khassenova, K., Shamisheva, N., & Zayed, N. M. (2021). Problems and prospects of railway passenger transport development in Kazakhstan. *Academy of Strategic Management Journal*, 20(2), 1-5.
21. Chernobay, L., Karska, E., & Shiron, Yu. (2022). Employees' types of intelligence assessment method in accordance with the elements of the five-factor model considering life cycle stages. *Economics, Entrepreneurship, Management*, 9(1), 26-33.
22. Wallman, S. M. H. (1996). The future of accounting and financial reporting, part II: The colorized approach. *Accounting Horizons*, 10(2), 138-148.

23. Nazarova, G., & Rudenko, V. (2023). Digital maturity and digital transformation in human resources management: Stability vs development. *Development Management*, 21(3), 57-65.
24. Balaji, V., & Mamilla, R. (2024). Intellectual capital and corporate sustainable growth: An empirical study on Indian agribusinesses specific to pesticides and fertilizer companies. *Qubahan Academic Journal*, 4(1), 1-18.
25. Sinaj, Z., Ramosacaj, M., & Kushta, E. (2023). Performance management assessment in agriculture organisations (using factorial parameters case of Albania). *Scientific Horizons*, 26(1), 102-110.
26. Vela, F., & Sinaj, Z. (2023). The impact of increasing performance and productivity in the management of human resources in Albanian enterprises. *Theoretical and Practical Research in Economic Fields*, 14(1), 85-93.
27. Younis Masiha, R. (2022). Effects of cryptocurrencies on global economics: A review study. *Qubahan Academic Journal*, 2(2), 9-15.
28. Miethlich, B., & Šlahor, L. (2018). Creating shared value through implementing vocational rehabilitation in the corporate social responsibility strategy: A literature review. In *Proceedings of the 32nd International Business Information Management Association Conference, IBIMA 2018 - Vision 2020: Sustainable Economic Development and Application of Innovation Management from Regional expansion to Global Growth* (pp. 1444-1460). Seville: International Business Information Management Association.
29. Francis, J., & Schipper, K. (1999). Have financial statements lost their relevance? *Journal of Accounting Research*, 37, 319-352.
30. Shalbolova, U., Chikibayeva, Z., & Kenzhegaliyeva, Z. (2021). Efficiency of investment projects to modernize facilities housing and communal services (case of Kazakhstan). *IOP Conference Series: Earth and Environmental Science*, 650(1), 012075.
31. Teymurova, V., Huseynli, I., & Miethlich, B. (2024). Operation of organizations and their relationship to corporate responsibility. *Public Organization Review*, 24, 75-95.
32. Abdel-Khalik, A. R. (2009). Fair value accounting and stewardship. *Accounting Perspectives*, 9(4).
33. Shalbolova, U. Zh., Chikibayeva, Z., Kenzhegaliyeva, Z., & Kim, E. (2021). Public-private partnership in the housing and communal services and university housing infrastructure of Kazakhstan. *Public Policy and Administration*, 20(5), 585-597.
34. Dobija, M. (2011). Abstract nature of money and the modern equation of exchange. *Modern Economics*, 2, 142-152.
35. Vasylyeva, O. O., Sokolov, A. V., Lisnichenko, M. O., Halan, O. Y., & Butenko, T. V. (2023). Socio-economic dimension of human potential of world countries in the digital space of the labor market. *Qubahan Academic Journal*, 3(4), 106-129.
36. Yaroshenko, O. M., Vapnyarchuk, N. M., Burnyagina, Y. M., Kozachok-Trush, N. V., & Mohilevskyi, L. V. (2020). Professional development of employees as the way to innovative country integration. *Journal of Advanced Research in Law and Economics*, 11(2), 683-695.
37. Pravdiuk, N., Pokynchereda, V., & Pravdiuk, M. (2019). The human capital of an enterprise: Theory and assessment methodology. *Baltic Journal of Economic Studies*, 5, 176-183.
38. Pasko, M., & Samoilenko, V. (2023). Study on the impact of incentives for enterprise personnel on labour productivity. *Development Management*, 21(2), 48-56.
39. Zakharchyn, H., & Sytnyk, Y. (2023). Construction and development of corporate knowledge in modern conditions. *Economics, Entrepreneurship, Management*, 10(1), 40-50.
40. Agapito, J. J. J., Jala, L. L. C., & Cruz-Español, R. (2022). Predictors of entrepreneurial attitude among administrators of selected community colleges and universities in Leyte. *Insights into Regional Development*, 4(4), 36-51.
41. Nurmahmudah, F., & Putra, E. C. S. (2020). What makes employees productive and have high performance? Human capital investment in universities. *Asian Journal of Education and Social Studies*, 11, 21-36.
42. Nicolaescu, S. S., Florea, A., Kifor, C. V., Fiore, U., Cocan, N., Receu, I., & Zanetti, P. (2020). Human capital evaluation in knowledge-based organizations based on big data analytics. *Future Generation Computer Systems*, 111, 654-667.
43. Miethlich, B. (2022). *Vocational rehabilitation in small and medium-sized enterprises: An integrated management perspective on potentials and business impact*. Berlin: Logos Verlag Berlin.
44. Hilorme, T., Perevozova, I., Sakun, A., Reznik, O., & Khaustova, Y. (2020). Accounting model of human capital assessment within the information space of the enterprise. *Academy of Accounting and Financial Studies Journal*, 24, 1-7.



МУКАЧІВСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ

89600, м. Мукачево, вул. Ужгородська, 26

тел./факс +380-3131-21109

Веб-сайт університету: www.msu.edu.ua

E-mail: info@msu.edu.ua, pr@mail.msu.edu.ua

Веб-сайт Інституційного репозитарію Наукової бібліотеки МДУ: <http://dspace.msu.edu.ua:8080>

Веб-сайт Наукової бібліотеки МДУ: <http://msu.edu.ua/library/>