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## CLASSIFICATION AND EVALUATION OF THE METHODOLOGY IN HUMAN CAPITAL ANALYSIS AT A COMPANY LEVEL

A. Assanova<sup>1</sup>, A. Ospanova<sup>2\*</sup>, R. Malayeva<sup>2</sup>

<sup>1</sup>Abai Kazakh National Pedagogical University, Institute Sorbonne-Kazakhstan, Almaty, Republic of Kazakhstan

<sup>2</sup>Kurmangazy Kazakh National Conservatory, Almaty, Republic of Kazakhstan

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### ABSTRACT

*The purpose of the study* is to explore the concept of human capital and its inherent factors, as well as to classify various approaches and methodologies for assessing human capital both within individual companies and in the national economy as a whole. This study aims to explore and consolidate methodologies used to assess human capital, offering valuable information for strategic decision making in an organizational context.

*Research methodology.* The study primarily uses a qualitative research approach based on a comprehensive review of both domestic and international literature. Scientific methods such as comparative analysis, systematic analysis, and classification are used.

*Originality/value of the research.* The importance of this research is in the amalgamation of diverse theoretical viewpoints and methods, leading to a holistic comprehension of evaluating human capital and its effects on both organizational effectiveness and societal advancement.

*Findings.* The methodology employed in this study enables organizations to make well-informed choices regarding the allocation of resources, employee growth initiatives, and talent retention strategies. Moreover, the incorporation of the Human Capital Index (HCI) emerges as a pivotal instrument, offering a thorough evaluation of workforce capabilities and their influence on organizational effectiveness. The HCI's capacity to measure the outcomes of human capital investments on productivity, innovation, and the enduring sustainability of the organization underscores its crucial role in shaping strategic decision-making processes.

*Keywords:* human capital index (HCI), human resource management, assets, employees, methodology, investments, profitability, competitiveness, revenue, metrics.

### INTRODUCTION

In the era of globalization, a lot of companies seek to have a competitive advantage [1]. They develop their technologies, increase economies of scale, make unique product, however still human resources play a vital role in this very process [2]. Human capital is considered as a lever in the whole company functioning, whereas their skills, education, competencies and knowledge can be stated as additional professional valuable asset along with an employee. The analysis of human capital extends its significance beyond the domain of human resource management.

The primary objective of this paper is to identify the current techniques and processes used for assessing human capital, which plays a pivotal role in enhancing the profitability and competitiveness of enterprises.

The key objectives of this study are to categorize and evaluate diverse strategies and techniques employed for the assessment of human capital in individual organizations and the wider national economy. In terms of methodology, this research delves into the theoretical foundations underpinning the assessment of human capital across different levels.

**Research methods.** In the article, we mainly provide qualitative type of the research. This research draws upon the theoretical and methodological foundations established through an in-depth analysis of both domestic and foreign literature pertaining to the subjects being examined. The study was conducted employing

various scientific methods of cognition, including comparative analysis, induction, and deduction, methods of actualization, systematic analysis, classification, abstraction, and concretization. According to the existing literature, we will clarify and underline key ways of providing the methodology of human capital assessment.

**Literature review.** The term «human capital» can be divided by two words, as «human» and «capital». An employee is a valuable asset of a company, which plays a significant role in profit and production growth [3]. Boldizzoni asserts that within the field of economics, human capital can be understood as the combination of human elements and capital. In an economic context, capital refers to the resources employed in the manufacturing of goods and services, which do not undergo significant consumption during the production phase. When considering the human aspect, it involves individuals who are responsible for various economic activities, including production, consumption, and transactions. When we delve into these ideas, we can discern that human capital represents a vital component of production that has the potential to create added value through its input [4].

Human capital can be defined as the collective reservoir of abilities and aptitudes possessed by individuals, which becomes evident through a region's educated and skilled labor force. Human capital is occasionally quantified in person-years of education and can be enhanced through both formal and informal educational or training endeavors [5]. It encompasses practical experience, on-the-job learning, and non-conventional technical training programs that contribute to skill enhancement. Human capital can exert substantial positive impacts on macroeconomic-level economic development through various channels. Investing in human capital involves the process of improving and enriching the skills, knowledge, and abilities of individuals to enhance their productivity and contributions to an organization or society.

According to Crawford (insert full citation here), when examining human capital from a broad perspective, it encompasses qualities such as adaptability, self-sustainability, portability, and shareability, particularly in contrast to physical labor. The adaptable and self-sustaining aspects of human capital are intricately connected to the notion that an individual's reservoir of knowledge contributes significantly to their human capital. Moreover, the development of human capital can be influenced by both internal (endogenous) and external (exogenous) factors. The original knowledge can continually evolve and expand through interactions with external knowledge, information, skills, experiences, and other knowledge-based elements.

From an economic perspective, the focus on knowledge as a characteristic of human capital becomes a fundamental element in addressing the «problem of scarcity», where limited resources are not evenly distributed among economic agents. By continually expanding and self-generating human capital, the role and influence of an individual as an economic agent can significantly extend [6].

The influence of human capital can be broadly divided into three main dimensions: the individual, the organization, and society as a whole (Figure 1).

**Individual Perspective:** When considering individuals in the external job market, the level of human capital possessed by an unemployed person significantly shapes their ability to find and secure employment. Those with higher human capital, as highlighted by Greider, Denise-Neinhaus, & Statham and Vinokur et al. enjoy an advantage in accessing job-related information and improving their employability [7; 8].

**Organizational Perspective:** From the standpoint of organizations, Lepak and Snell stress the strong connection between human capital and an organization's core competencies and overall competitiveness [9]. Likewise, according to Kwon, an individual's human capital can have an impact on the collective competencies, routines, culture, and relational capital of an organization [10].

**Social Perspective:** Viewed from a social standpoint, the dimension of human capital represents an amalgamation of the influences stemming from both individuals and organizations. According to McMahon, human capital can contribute to concepts like democracy, human rights, and political stability by fostering a shared social consciousness [11]. Beach also highlights that human capital can enhance the social awareness of community members, leading to increased social consciousness. This intricate relationship between human capital and social awareness has profound implications for socio-political development [12] (see Figure 1).

In essence, the influence of human capital extends beyond the individual and organizational realms to encompass the broader societal context, where it can have far-reaching effects on social development and political stability.

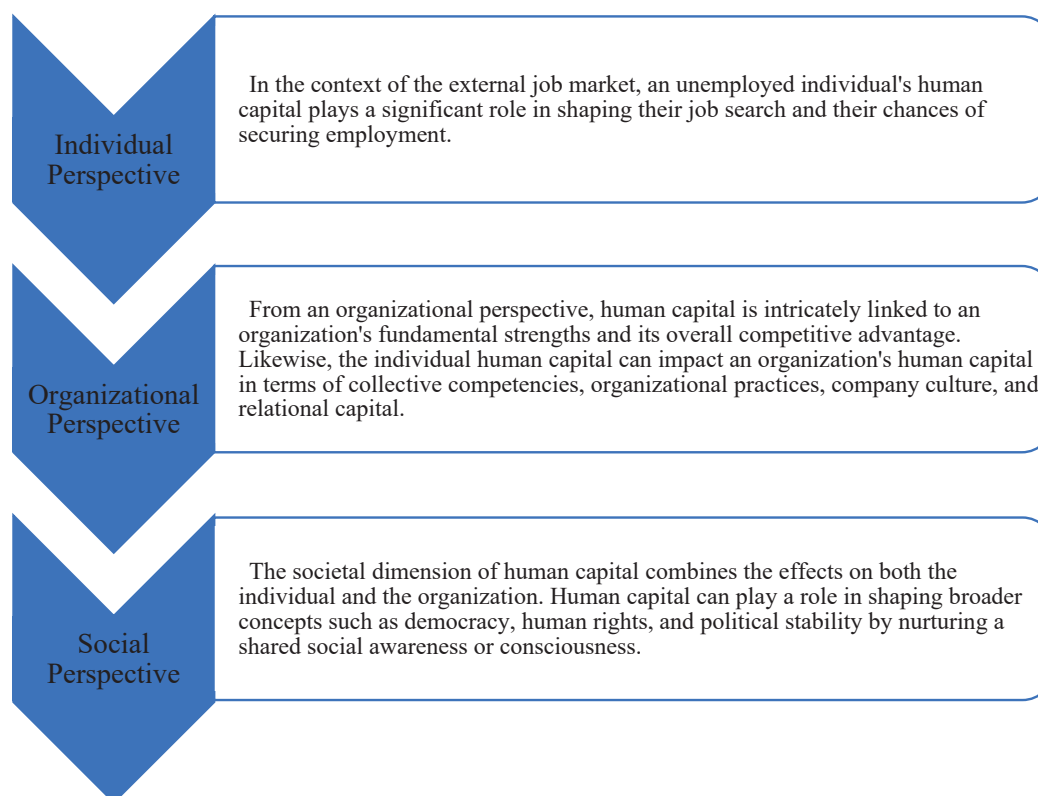


Figure 1 – Three dimensions of human capital

Note – Compiled by the author on the base of [4-8; 7-11].

In this research, we try to find out the right types of methodology that assess human capital and identify prior directions to invest in. Assessing human capital is of paramount importance for various reasons: firstly, it enables organizations to make well-informed strategic decisions regarding hiring, training, and development, ultimately aligning their human resources with their broader goals. Second, it allows companies to identify both the strengths and weaknesses within their workforce, offering valuable insights into areas that may require improvement and where employees excel. Third, by assessing human capital, organizations can determine the return on their investments in employee training and development, ensuring that resources are being used efficiently. Finally, it plays a crucial role in talent retention, as recognizing and rewarding high-performing employees can reduce turnover rates and associated recruitment costs.

According to Pravdiuk et al., human capital is an intangible asset, which can be assessed by forecasting its future value. Authors provide the calculation of the initial value of the employees, by assessing their physical abilities, education and experience. Researchers are of the opinion that this approach aligns more logically with economic principles because it conforms to the widely accepted notion that any potential represents a chance to secure future benefits, and the potential outcome is linked to both the qualitative and quantitative aspects of labor potential [13].

### THE MAIN PART

Evaluating the effectiveness of investments in human capital is crucial for organizations, governments, and individuals to make informed decisions. According to the literature review, we categorized assessment in human capital as follows: financial, productivity and satisfaction; learning and skills comparative aspects (see Table 1).

*Financial or economical metrics* are quantitative measures used to assess the financial performance and health of a business or organization. These metrics provide a snapshot of an entity's financial status and are

crucial for making informed decisions about operations, investments, and future strategies. Below, there are presented several financial metrics that can be used to assess return from investment capital:

Table 1 – Financial measures for evaluating the efficiency of human resources

№	Name	Description
1	Return on Investment (ROI)	This approach is widely used to evaluate investments in human capital. It entails directly comparing the benefits, such as increased productivity, revenue gains, or cost savings, associated with an investment with the costs incurred. A positive return on investment (ROI) signifies a profitable investment, while a negative ROI indicates an unprofitable one.
2	Cost-Benefit Analysis (CBA)	Cost-benefit analysis (CBA) entails assessing the costs of human capital development initiatives against their quantifiable benefits. This method considers both financial and non-financial advantages, such as improved employee satisfaction or decreased turnover rates.
3	Cost-Effectiveness Analysis (CEA)	Cost-effectiveness analysis (CEA) calculates the cost per unit of achieved outcomes. Rather than measuring financial gains, it concentrates on specific results, such as the cost per trained employee or the cost of acquiring a degree.
Note – Compiled by the author on the base of [14].		

Financial performance is vital in evaluating the effects of investments in human capital on an organization's financial health. Productivity indicators serve as the next set of benchmarks, gauging changes in productivity resulting from human capital investments. Examples include output per employee, revenue per employee, and profit margins. Comparing these metrics before and after an investment can provide insights into its impact. Some of the indicators to consider are:

Table 2 – Productivity indicators for assessing the effectiveness of human capital

№	Name	Description
1	Employee Performance Metrics	Evaluating individual or team performance both pre- and post-training or development programs can offer valuable insights into the return on investment. Performance indicators might encompass key performance indicators (KPIs), goal accomplishment, or job satisfaction.
2	Employee Turnover Rate	A decrease in employee turnover subsequent to human capital investments can suggest heightened employee satisfaction, engagement, and commitment to their roles. Reduced turnover rates can result in cost savings through decreased expenditures on recruitment and training.
Note – Compiled by the author on the base of [15; 16].		

Evaluating employee productivity and turnover is crucial for gauging the effects of investments in human capital. Through comparing individual or team performance before and after training, organizations can assess the efficacy of their investments. Performance metrics encompass key performance indicators, goal attainment, and job satisfaction. Moreover, decreased employee turnover resulting from these investments signifies heightened employee contentment and dedication, leading to savings in recruitment and training expenses. These metrics directly impact the company's profitability (Table 3).

Table 3 – Training and comparative metrics for assessing the effectiveness of human capital

№	Name	Description
1	Surveys and Feedback	Gathering input from employees who have participated in training or development programs can yield valuable qualitative insights regarding the efficacy of the investment. Such feedback can be acquired through various means, including surveys, interviews, or focus groups, with the objective of evaluating their perspectives on how the program has influenced their skill growth and job satisfaction.
2	Employee Turnover Rate Skills Assessments	Periodically assessing the skills and competencies of employees can help determine if the investment in training and development has led to skill improvements.
3	Learning and Development Analytics	Monitoring participation rates, completion rates, and employee advancements within training programs can facilitate the assessment of their effectiveness. Utilizing learning management systems (LMS) and analytics tools can aid in this evaluation process.
4	Long-Term Impact Analysis	Human capital investments may not yield immediate results. It is important to assess their long-term impact on the organization's competitiveness, innovation, and adaptability to changes in the market.
5	Benchmarking	Comparing the outcomes of human capital investments with industry benchmarks or competitors' performance can provide context for evaluating their effectiveness.
6	Qualitative Analysis	In addition to quantitative measures, consider qualitative factors such as improved communication, leadership, teamwork, and problem-solving skills when evaluating human capital investments.
Note – Compiled by the author on the base of [17].		

Evaluating investment in human capital is an ongoing process that should align with the organization's strategic goals and adapt to changing circumstances. Utilizing a combination of various evaluation methods can offer a more holistic insight into the effects of these investments.

Above methods are good for evaluating employee performance and identifying in which area the company should invest. However, these factors represent the company's performance and profitability. But, if we look at human capital development, as an asset to invest, from the human side? The World Bank recently introduced the World Bank Human Capital Index (HCI), which measures the potential human capital development of a child born today until the age of 18, considering the prevalent risks to education and health in their country of birth. The HCI is expressed in units of productivity relative to a reference point of complete education and optimal health, with values on a scale from 0 to 1. An HCI score of  $x$  indicates that a child born today can expect to be only  $x \times 100\%$  as productive as a future worker with access to complete education and optimal health. This methodology is firmly grounded in the extensive body of literature on development accounting.

The World Bank periodically reports the Human Capital Index (HCI) for countries around the world. The purpose of the HCI is to quantitatively measure so-called child development milestones and their subsequent impact on the productivity of the future workforce. The World Bank has applied the Human Capital Index (HCI) to assess human capital development in various countries, including Kazakhstan. This assessment encompasses factors such as health, education, and survival, providing valuable insights into a specific country's potential for human capital development (see Figure 2).

The data mentioned above contributes to the construction of the human capital index. These indicators are commonly employed to evaluate the caliber and quantity of human capital in a specific population or organization. In this regard, the Human Capital Index amalgamates these elements to furnish a comprehensive measurement of a population's educational attainment and life expectancy, both of which are crucial facets of human capital development. When these components are integrated into a comprehensive index, it can function as a valuable approach for appraising investments in human capital and comprehending the potential economic and social consequences linked with such investments.



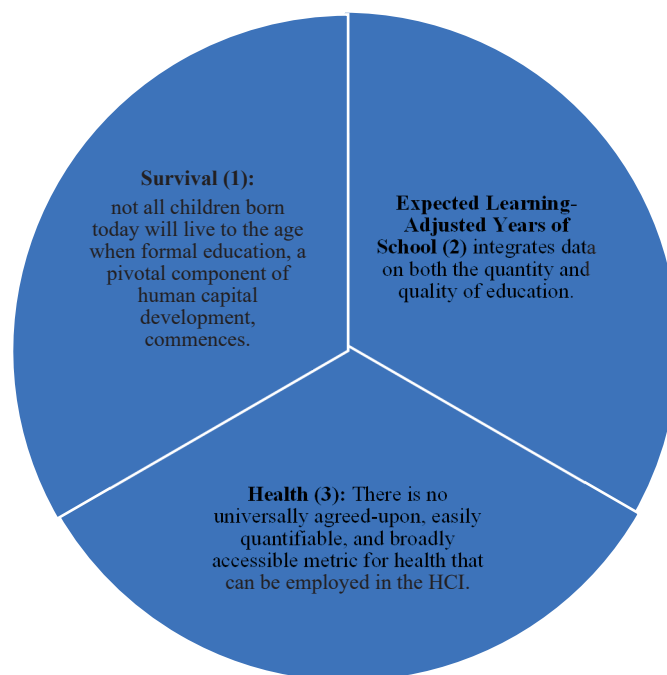


Figure 2 – Elements of the Human Capital Index (HCI)

Note – Compiled by the author on the base of [18]

The fusion of these three components gives rise to the Human Capital Index, offering a comprehensive evaluation of the development of human capital among contemporary children. This index considers their chances of survival, the probable scope and quality of education they are expected to attain, and the overall healthcare setting in which they will mature and flourish.

$$hi = e^{\varphi si + \gamma zi} \quad (1)$$

The equation (1), which is presented above indicates worker's productivity, where  $s_i$  – worker's education and  $i$  – health. The parameters  $\varphi$  and  $\gamma$  signify the «return» from an additional unit of education and health, respectively. In this equation, human capital is expressed as  $s_i = z_i$ , with  $h_i = 1$  [18].

The Human Capital Index (HCI) serves as a valuable resource for employers, offering insights into the educational and health progression of a country's workforce. This information proves beneficial for talent acquisition, workforce planning, training and development, investment choices, and performance evaluation. Employers can utilize this index to evaluate the caliber of the local workforce, make informed decisions when entering new markets, and advocate for policies that foster human capital development. Ultimately, this contributes to the well-being and productivity of employees and the regions in which businesses operate.

The data underpinning the HCI index is obtained from the World Bank in the Table 4, encompasses variables like anticipated years of schooling, the percentage of children under 5 years old without growth stunting, standardized test scores, years of schooling adjusted for learning, the likelihood of survival (up to 5 years), and survival rates between ages 15 and 60. The HCI data for Kazakhstan is reported for the period 2017-2020 to capture and analyze trends over a four-year span, providing a comprehensive view of the country's human capital development during that time.

The data for 2019 is not available, and this gap may be attributed to factors such as incomplete reporting, data collection delays, or methodological changes in the assessment process. It is essential to acknowledge these limitations in the analysis.

Table 4 – Data for HCI Kazakhstan (2017-2020)

Name (in % rate)	2017	2018	2019	2020
Anticipated Years of School	13,3	13,7	No data	13,7
Proportion of Children Under 5 Without Stunted Growth	0,9	0,9	No data	0,9
Harmonized Test Scores	537,0	537,3	No data	416,2
Learning-Adjusted Years of School	11,5	11,8	No data	9,1
Probability of Survival to Age 5	0,9	0,9	No data	0,9
Survival Rate from Age 15-60	0,8	0,8	No data	0,8
Note – World Bank Data [18]				

The variable «Anticipated Years of School» reflects the average number of formal education years a child can typically access by the age of 18, considering enrollment and educational accessibility in a specific region or country. The «Fraction of Children Under 5 Not Stunted» indicates the proportion of children below the age of 5 who do not display signs of stunted growth, often used as an indicator of child health and nutrition. «Harmonized Test Scores» are standardized scores derived from various student achievement tests, ensuring that scores from different assessments are comparable after adjustments for variations in test difficulty or scoring scales. «Learning-Adjusted Years of School» consolidates data on both the quantity and quality of education, accounting for years of schooling and actual learning outcomes. This composite variable offers a more comprehensive assessment of educational achievement. «Survival Probability (up to 5 Years)» signifies the likelihood of a child born today surviving until the age of 5, serving as a crucial indicator of a child's health and overall well-being. Furthermore, «Survival from age 15 to 60 years» calculates the percentage of individuals surviving from age 15 to 60 years, reflecting adult survival rates and the probability of reaching middle age.

These variables constitute components of the Human Capital Index (HCI) and are employed to evaluate and compare human capital development across various countries. They offer insights into aspects like education, health, and overall quality of life, which contribute to a nation's human capital potential (see Figure 3).

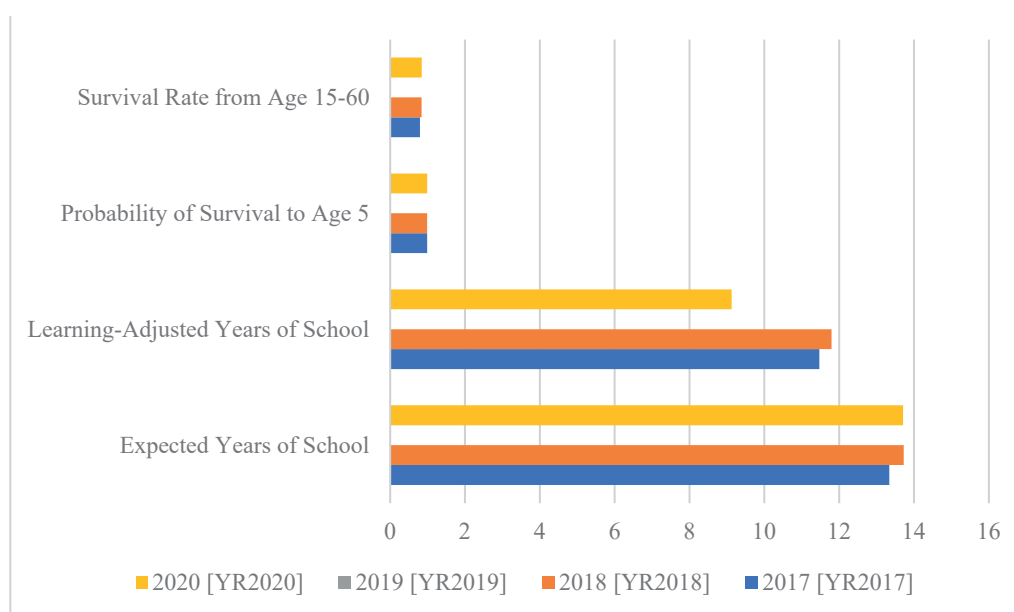


Figure 3 – Graphical representation of the data for HCI Kazakhstan

Note – Compiled by the author based on the source [18]

The data mentioned above contributes to the construction of the human capital index. These indicators are commonly employed to evaluate the caliber and quantity of human capital in a specific population or organization. In this regard, the Human Capital Index amalgamates these elements to furnish a comprehensive measurement of a population's educational attainment and life expectancy, both of which are crucial facets of human capital development (Table 5). When these components are integrated into a comprehensive index, it can function as a valuable approach for appraising investments in human capital and comprehending the potential economic and social consequences linked with such investments.

Table 5 – HCI Kazakhstan (2017-2020)

HCI	2017	2018	2019	2020
Human Capital Index (HCI) from 0 to 1	0,746	0,77	no data	0,63
Human Capital Index (HCI) for females from 0 to 1	0,78	0,80	no data	0,65
The Human Capital Index (HCI) for males from 0 to 1.	0,714	0,75	no data	0,61
Note – World Bank Data [18]				

The Human Capital Index (HCI) ranges from 0 to 1, in this context:

0: A value of 0 on the HCI indicates lower human capital development. This could suggest challenges in areas such as education, health, and workforce skills, signaling a need for improvement and investment in these sectors.

1: A value of 1 represents higher human capital development. This suggests that the country has made significant progress in fostering skills, education, and health among its population, contributing to a more productive and capable workforce.

The simplified correlation between the Human Capital Index (HCI) and future income levels, as discussed here, primarily revolves around comparisons in a stable or equilibrium state. Collin and Weil further explored this concept in a related study by constructing a calibrated growth model that tracks the adjustments needed to reach such an equilibrium state. Their model is employed to identify potential growth paths for per capita GDP and poverty rates for individual countries and global aggregates, taking into account various assumptions regarding future human capital development. Additionally, they calculate the increase in investment in physical capital required to achieve the same output gains as those resulting from improvements in human capital. This research contributes to a deeper comprehension of the intricate relationship between human capital, economic growth, and the alleviation of poverty [19].

## CONCLUSION

In conclusion, the Human Capital Index (HCI) stands as a pivotal tool in the methodology for evaluating investments in human capital within a company. By offering a comprehensive assessment of the workforce's skills, knowledge, and capabilities, the HCI fosters a detailed comprehension of the tangible and intangible contributions of human resources to overall organizational performance. Additionally, its capacity to quantify the impact of human capital investments on productivity, innovation, and long-term organizational sustainability underscores its critical role in informing strategic decision-making processes. As businesses navigate the dynamic landscape of the modern economy, incorporating HCI as a core evaluation methodology is imperative to facilitate informed resource allocation, employee development, and ultimately ensure sustainable growth and competitive advantage in the marketplace.

The Human Capital Index (HCI) provides a holistic assessment of human capital, including non-material elements often overlooked by financial measures. It enables cross-country comparisons and guides policy decisions, emphasizing long-term impacts. However, subjectivity in measuring non-material aspects, cultural



variations, data availability challenges, and the dynamic nature of human capital pose limitations to its accuracy and applicability. Despite these drawbacks, HCI remains a valuable tool for understanding and addressing the complexities of human capital development.

**Further Implications.** This research faces obstacles such as limited and unreliable data, cultural variations impacting interpretation, methodological limitations, and the dynamic nature of human capital. To mitigate these challenges, there is a need for improved data collection mechanisms to ensure comprehensive and accurate reporting. Tailoring assessment methods to be culturally sensitive and continually refining research methodologies can enhance the robustness of the findings. Additionally, fostering international collaboration and implementing real-time monitoring systems can contribute to a more accurate and holistic understanding of human capital development, allowing for more effective policymaking.

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## КОМПАНИЯ ДЕҢГЕЙІНДЕ АДАМИ КАПИТАЛДЫ ТАЛДАУ ӘДІСТЕМЕСІН ЖІКТЕУ ЖӘНЕ БАҒАЛАУ

А. Асанова<sup>1</sup>, Ә. Оспанова<sup>2\*</sup>, Р. Малаева<sup>2</sup>

<sup>1</sup>Абай атындағы Қазақ ұлттық педагогикалық университеті, Сорбонна-Қазақстан институты, Алматы, Қазақстан Республикасы

<sup>2</sup>Құрманғазы атындағы Қазақ ұлттық консерваториясы, Алматы, Қазақстан Республикасы

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### АНДАТПА

*Зерттеудің мақсаты* – адами капитал түсінігін және оған тән факторларды зерттеу, сондай-ақ жеке компаниялар ішінде де, жалпы ұлттық экономикада да адами капиталды бағалаудың әртүрлі тәсілдері мен әдістемелерін жіктеу болып табылады. Бұл зерттеудің мақсаты адами капиталды бағалау және ұйымдық контекстте стратегиялық шешімдер қабылдау үшін құнды ақпаратты қамтамасыз ету үшін қолданылатын әдістемелерді зерттеу және шоғырландыру болып табылады.

*Зерттеу әдістемесі.* Зерттеуде ең алдымен отандық және халықаралық әдебиеттерді жан-жақты шолуға негізделген сапалы зерттеу әдісі қолданылады. Салыстырмалы талдау, жүйелі талдау, жіктеу сияқты ғылыми әдістер қолданылады.

*Зерттеудің өзіндік ерекшелігі/құндылығы.* Зерттеудің маңыздылығы адами капиталды бағалауды жан-жақты түсінуге ықпал ететін әртүрлі теориялық перспективалар мен әдістемелердің синтезінде жатыр.

*Нәтижелер.* Осы зерттеуде пайдаланылған әдістеме ұйымдарға ресурстарды бөлу, қызметкерлердің өсу бастамалары және таланттарды сақтау стратегияларына қатысты саналы таңдау жасауға мүмкіндік береді. Сонымен қатар, адам капиталының индексі (НСІ) қосу жұмыс күшінің мүмкіндіктерін және олардың ұйымдық нәтижелерге әсерін мұқият бағалауды ұсынатын негізгі құралға айналады. НСІ адами капиталға инвестициялау нәтижелерін өнімділік, инновациялар және ұзақ мерзімді ұйымдық тұрақтылық тұрғысынан өлшеу қабілеті оның стратегиялық шешімдер қабылдау процестерін қалыптастырудағы маңызды рөлін көрсетеді.

*Түйін сөздер:* адам капиталының индексі (НСІ), адам ресурстарын басқару, активтер, қызметкерлер, әдістеме, инвестициялар, табыстылық, бәсекеге қабілеттілік, кіріс, метрика.

## КЛАССИФИКАЦИЯ И ОЦЕНКА МЕТОДОЛОГИИ АНАЛИЗА ЧЕЛОВЕЧЕСКОГО КАПИТАЛА НА УРОВНЕ КОМПАНИИ

А. Асанова<sup>1</sup>, А. Оспанова<sup>2\*</sup>, Р. Малаева<sup>2</sup>

<sup>1</sup>Казахский национальный педагогический университет имени Абая, Институт Сорбонна-Казахстан, Алматы, Республика Казахстан

<sup>2</sup>Казахская национальная консерватория имени Курмангазы, Алматы, Республика Казахстан

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### АННОТАЦИЯ

*Цель исследования* заключается в изучении понятия человеческого капитала и присущих ему факторов, а также в классификации различных подходов и методологий оценки человеческого капитала как внутри отдельных компаний, так и в национальной экономике в целом. Целью данного исследования является изучение и консолидация методологий, используемых для оценки человеческого капитала, и предоставление ценной информации для принятия стратегических решений в организационном контексте.

*Методология исследования.* В исследовании в первую очередь используется качественный исследовательский подход, основанный на всестороннем обзоре как отечественной, так и международной литературы. Используются такие научные методы, как сравнительный анализ, систематический анализ, классификация.

*Оригинальность / ценность исследования.* Значимость исследования заключается в синтезе различных теоретических точек зрения и методологий, что способствует всестороннему пониманию оценки человеческого капитала и ее последствий для эффективности деятельности организации и общественного развития.

*Результаты.* Методология, использованная в этом исследовании, позволяет организациям делать осознанный выбор в отношении распределения ресурсов, инициатив по росту сотрудников и стратегий удержания талантов. Более того, включение Индекса человеческого капитала (HCI) становится ключевым инструментом, предлагающим тщательную оценку возможностей рабочей силы и их влияния на эффективность организации. Способность HCI измерять результаты инвестиций в человеческий капитал с точки зрения производительности, инноваций и долгосрочной устойчивости организации подчеркивает его решающую роль в формировании процессов принятия стратегических решений.

*Ключевые слова:* индекс человеческого капитала (HCI), управление человеческими ресурсами, активы, сотрудники, методология, инвестиции, рентабельность, конкурентоспособность, выручка, метрики.

#### ABOUT THE AUTHORS

**Assanova Aiman Zhanatovna** – master of economic sciences, senior lecturer, Abai Kazakh National Pedagogical University, Institute Sorbonne-Kazakhstan, email: aiman\_assanova@mail.ru; ORCID ID: 0009-0003-3519-8037.

**Ospanova Aigerim Maratovna** – PhD, lecturer, Kurmangazy Kazakh National Conservatory, email: aigerim\_marat@list.ru; ORCID ID: 0000-0002-5688-7523\*

**Raushan Malayeva Amanbekovna** – candidate of economic sciences, Associate Professor, Kurmangazy Kazakh National Conservatory, email: rauka.ru@mail.ru; ORCID ID: 0000-0002-1162-9942.

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#### ПРОФЕССИОНАЛЬНОЕ ВЫГОРАНИЕ ПЕРСОНАЛА: ПРИЧИНЫ, ЭКОНОМИЧЕСКИЕ ПОСЛЕДСТВИЯ, ПУТИ ПРЕДОТВРАЩЕНИЯ

Д. Я. Куатова<sup>1</sup>, А. А. Жакупова<sup>1\*</sup>

<sup>1</sup>Университет Нархоз, Алматы, Республика Казахстан

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#### АННОТАЦИЯ

*Цель исследования.* На основе критического анализа научных исследований, посвященных проблемам социального и финансового благополучия сотрудников, их физического и ментального здоровья, доказать объективную реальность профессионального выгорания работников и предложить такие формы мотивации труда, которые не требуют от владельцев бизнеса, от работодателей существенных вло-