

HUMAN CAPITAL MANAGEMENT AT ENTERPRISES IN KAZAKHSTAN**¹A.K. Butkenova*** , **²V.G. Kogdenko** ¹Astana International University, Astana, Kazakhstan²National Research Nuclear University "Moscow Engineering Physics Institute", Moscow, Russia*e-mail: butkenova@mail.ru

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Abstract. This article will examine human capital management and analysis at enterprises in Kazakhstan and across businesses in general. First, I'd like to discuss the definition of human capital and its economic value. So, what is human capital? Human capital is the totality of knowledge, skills, abilities, experience and other personal characteristics of an employee that have economic value and can be used to create value in an organization.

It includes education (secondary, higher, postgraduate) and professional skills of the employee, leadership qualities that not everyone has, which are inherent in nature, motivation and involvement in the business and work that inspires professional performance of tasks, as well as creativity and the ability to further learn, such as improving the qualifications of a person throughout their entire working life. Considering the importance of providing labor resources and the need for a certain high qualification of these resources for the effective operation of the enterprise, it is necessary to plan these resources, and purposefully manage their formation, quality, and development. All of this is carried out within the framework of the human resources (human capital) management strategy, which will be discussed in this article.

The concepts of personnel management have significantly enriched the theory of enterprise management and, at the same time, brought about significant changes in the practical tools used. Being a scientific and methodological basis for the functioning of the enterprise's personnel management system, individual provisions of the considered concepts are effective when used in domestic enterprises.

Keywords: Human capital; human capital management; employee analysis and management; economic values; working conditions; human resources.

**УПРАВЛЕНИЕ ЧЕЛОВЕЧЕСКИМ КАПИТАЛОМ НА ПРЕДПРИЯТИЯХ
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Аннотация. В данной статье будет рассмотрено управление и анализ человеческим капиталом на предприятиях Казахстана и в целом на предприятиях. Для начала хотелось бы остановиться в определении человеческого капитала и его экономической ценности. И так что такое человеческий капитал? Человеческий капитал — это совокупность знаний, умений, навыков, опыта и других личностных характеристик работника, которые имеют экономическую ценность и могут быть использованы для создания ценности в организации. Он включает в себя образование (среднее, высшее, послевузовское) и профессиональные навыки сотрудника, лидерские качества которые есть не у каждого человека так заложено природой, мотивацию и вовлеченность в дело и работу которая вдохновляет на профессионализм выполнения задач, а так же креативность и способность к дополнительному обучению, такие как повышение квалификации всего периода работоспособности человека.

Учитывая важность обеспечения трудовыми ресурсами и необходимость определенной высокой квалификации этих ресурсов для эффективной работы предприятия, необходимо осуществлять планирование этих ресурсов, целенаправленное управление их формированием, качеством, развитием. Все это как раз осуществляется в рамках стратегии управления человеческими ресурсами (человеческим капиталом), о чем и будет речь в данной статье.

Концепции управления персоналом существенно обогатили теорию управления предприятием и вместе с тем внесли существенные преобразования в используемый практический инструментарий. Будучи научно-методической основой функционирования системы управления персоналом предприятия отдельные положения рассмотренных концепций результативны при использовании на отечественных предприятиях.

Ключевые слова: Человеческий капитал, управление человеческим капиталом, анализ и управление сотрудников, экономические ценности, условия труда, человеческие ресурсы.

ҚАЗАҚСТАН КӘСПОРЫНДАҒЫ АДАМИ КАПИТАЛДЫ БАСҚАРУ

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Аңдатпа. Бұл мақалада қазақстандық кәсіпорындардағы және жалпы бизнестегі адами капиталды басқару мен талдау қарастырылады. Біріншіден, адам капиталының анықтамасын және оның экономикалық мәнін талқыласақ. Сонымен, адами капитал дегеніміз не? Адами капитал – бұл ұйымда құндылық жасау үшін пайдаланылуы мүмкін экономикалық құндылығы бар қызметкердің білімінің, дағдыларының, тәжірибесінің және басқа да жеке қасиеттерінің жиынтығы. Оған қызметкердің білімі (орта, жоғары, жоғары оқу орнынан кейінгі) және кәсіптік дағдылары, әр адамда бола бермейтін, табиғатына тән көшбасшылық қасиеттері, мотивациясы және тапсырмаларды орындауда кәсіпқойлыққа, сонымен қатар шығармашылыққа және

адамның еңбек өмірінің бүкіл кезеңінде біліктілікті арттырудан өту сияқты қосымша оқудан өту мүмкіндігіне шабыттандыратын жұмысқа және тапсырмаға қатысу кіреді.

Кәсіпорынның тиімді жұмыс істеуі үшін еңбек ресурстарымен қамтамасыз етудің маңыздылығын және осы ресурстардың белгілі бір жоғары біліктілігінің қажеттілігін ескере отырып, бұл ресурстарды жоспарлау, олардың қалыптасуын, сапасын және дамуын мақсатты түрде басқару қажет. Мұның бәрі осы мақалада талқыланатын адам ресурстарын (адами капиталды) басқару стратегиясының шеңберінде жүзеге асырылады.

Персоналды басқару тұжырымдамалары кәсіпорынды басқару теориясын айтарлықтай байытты және сонымен бірге қолданылатын практикалық құралдарға елеулі өзгерістер әкелді. Кәсіпорынның персоналды басқару жүйесінің жұмыс істеуінің ғылыми-әдістемелік негізі бола отырып, отандық кәсіпорындарда қарастырылған тұжырымдамалардың жеке ережелері тиімді болып келеді.

Кілт сөздер: Адами капитал, адами капиталды басқару, қызметкерлерді талдау және басқару, экономикалық құндылықтар, еңбек жағдайлары, адам ресурстары.

Introduction. Human capital analysis and management is an area of personnel management that involves assessing, developing, and effectively using the knowledge, skills, experience, and potential of employees to achieve the strategic goals of the organization. Human capital analysis allows us to determine: to what extent employees meet the organization's requirements, what their strengths and weaknesses are (education, qualifications, work experience, communication skills, stress resistance), where there are gaps in knowledge and skills, the level of employee turnover (not always dependent on the level of human capital; turnover is influenced by working conditions and compensation), and the effectiveness of investments in training.

The goal in human capital management is to ensure that the right people with the right competencies are available at the right time (Nevretdinova, 2015:56-59).

What methods of human capital management analysis exist today:

1. HR analytics: collecting and analyzing employee data
2. Employee performance assessment (KPIs, OKRs)
3. Talent review
4. 360-degree feedback
5. Competency analysis

Why are human capital management analysis methods used? To determine each employee's potential and performance. There are several types of compensation systems in companies. The main motivation is to receive higher salaries, additional bonuses, and incentives. KPIs and OKRs are among them.

There are key management aspects such as:

1. Talent acquisition (recruiting)
2. Onboarding
3. Personnel training and development
4. Performance and productivity assessment
5. Career and succession planning
6. Personnel retention and motivation
7. Knowledge and corporate culture management (National Authority for Professional Qualifications).

For example, influence during recruitment has a positive effect on those employees who have been working at the company for several years; when new employees are being adapted, older employees help with advice, support, and training. Continuity and career planning aren't common in all companies, but they positively impact the company's economic value. Employees plan and strive for continuous advancement. The company, for its part, motivates employees to improve their working conditions and performance; thus, each organization strives to retain the best employees in their field.

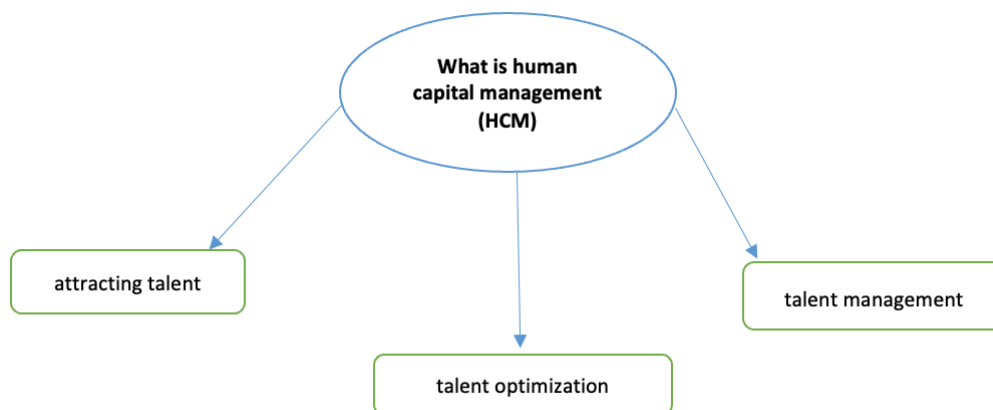


Fig 1. Human Capital Management (A. Alekseenko, 2025)

In today's reality, there are human capital management tools: HRM systems (SAP SuccessFactors, Workday, 1C:ZUP, etc.), competency and potential assessment systems, learning management systems (LMS), and personnel analytics platforms (Power BI, Tableau). Modern companies are keeping pace with emerging trends such as the use of artificial intelligence and machine learning in HR analytics, growing interest in well-being programs, hybrid and remote work formats, an emphasis on soft skills and emotional intelligence, and the development of employee. If you look back 10 years in Kazakhstan, not everyone adopted a hybrid and remote work format. This came about after the pandemic, and even now, although offline work is possible, online work, meetings, and conferences remain to save time. The country's human capital potential is substantial, but there are areas for improvement, particularly in skills and social-behavioral competencies.

Kazakh researchers have noted that human capital is becoming a critical element of economic growth and competitiveness, especially during the transition to a knowledge economy. The state program Digital Kazakhstan also considers the development of human capital as a key factor in the modernization of the economy through digitalization.

Businesses in Kazakhstan operate in an environment where employee skills, adaptability, training, and engagement become competitive advantages. Given the transformation of the economy: the raw materials sector → more technological, service and knowledge-oriented areas, human capital management is acquiring strategic importance. When analyzing human capital, companies can pay attention to the following parameters:

1. Employee competencies: availability of necessary knowledge and skills (both technical and behavioral)
2. Development potential: the extent to which employees are capable of learning and transitioning to new roles
3. Level of motivation and engagement
4. Labor productivity: how employee contributions influence the final result
5. Employee turnover: reasons for leaving, loss of knowledge
6. Alignment with the company's strategic goals: are there employees who support the development strategy?
7. ROI (return on investment) from training and human capital development.

Human capital analysis is more than just a matter of tracking personnel and salaries; it is a strategic tool that focuses on the competencies, potential, and value of employees for the business. This tool isn't yet fully developed in Kazakhstani enterprises (perhaps especially in small and medium-sized businesses), but the trend is toward strengthening it. It is recommended to implement systems for collecting and analyzing personnel data (HR analytics), performance and potential indicators, and link them to business goals.

Best practices for Human Capital Management



Fig 2. Best practices for human capital management (What is Human Capital Management (HCM)?)

To improve the efficiency of human capital analysis and management at enterprises in Kazakhstan, the following can be recommended:

1. Link HR metrics to business goals

- Determine which business outcomes are important (e.g., increased productivity, reduced turnover, innovation) and which HR metrics influence these outcomes. Establish key performance indicators (KPIs) for the HR function, such as onboarding time, engagement level, percentage of employees who completed development, and key employee turnover.

2. Develop future competencies

- In addition to technical skills, focus on soft skills: communication, critical thinking, flexibility, and digital skills.

- Organize training and development programs that address the evolving needs of the company.

3. Implement HR analytics and technologies

- Collect personnel data: training, performance, engagement, turnover, and competency compliance.

- Use data analysis tools to make forecasts and see connections between HR metrics and business results.

- Build reports/dashboards so that management can see HR metrics as part of the business.

4. Retain and motivate talented employees

- Develop a system of rewards, recognition, and career paths.

- Create internal development and advancement opportunities.

- Focus on a work culture and an environment where employees feel valued and recognized.

5. Succession and talent management planning

- Identify critical roles and employees whose loss could impact the business.

- Develop plans for reserve development and knowledge transfer.

- Consider the generational characteristics of employees (especially relevant for Kazakhstan, where intergenerational differences may exist). For example, there is a study titled "Assessment and Development of a Human Capital Development Mechanism Based on Social Generational Differences in the Republic of Kazakhstan."

6. **Support a culture of learning and innovation**

- Encourage employees to participate in change initiatives and learn new ways of working.
- Develop a corporate culture focused on knowledge and improvement, not just task completion.

7. **Consider the specifics of the Kazakhstani labor market and national context**

- Consider regional differences, the level of personnel training, and migration within the country.

- Be prepared to adapt international HR management practices to local realities: language, cultural characteristics, and industry specifics.

Improving the efficiency of human capital analysis and management in enterprises is an important task for improving productivity, employee retention, and achieving strategic goals in enterprises.

HR recommendations:

Developing an Internal Talent Pool: Instead of constant external recruiting (costly and time-consuming), focus on training and upskilling existing employees (upskilling/reskilling). Transparent Career Tracks: Implement career planning platforms where employees see opportunities for growth within the company. Improving Onboarding: Automate the onboarding process for new hires to quickly reach full productivity.

Employee engagement recommendations:

Flexible Work Models: Incorporate hybrid or remote work arrangements into company policy, if possible, to improve work-life balance. Continuous Feedback: Replace annual reviews with regular 1:1 meetings between managers and subordinates. Mental Health Programs: Implement corporate support programs, including psychological support and well-being days.

Motivation recommendations:

Personalization of benefits (Cafeteria plan): Allow employees to choose their own set of social benefits (health insurance, fitness, training, parking). Compensation transparency: Use HR technologies to demonstrate to employees their income structure and opportunities for increasing it (payment transparency). Linking KPIs to business results: Revise the bonus system, tying it not to the process, but to the ultimate impact on profits or company performance.

To successfully address these challenges, it is necessary to transform the HR department from a "personnel department" to a strategic partner that invests in people to increase business value.

The Kazakh economy, being a market economy, presupposes the existence and operation of independent private companies in all areas of economic activity, including industry. Currently, a large number of private and state-owned companies (including those wholly controlled by the state) operate in the industry. However, each company is an independent legal entity, planning its own activities and developing a development strategy. The strategy of each enterprise is undoubtedly connected with determining the enterprise's place in the market, with focusing on certain market segments, and with providing resources. All of this must be planned for the long term, taking into account possible market changes, partner activities, government regulations, and other factors. Resource provision for any industrial enterprise typically receives a great deal of attention. It includes the provision of material resources (raw materials, materials, semi-finished products, means of production), and labor resources. Labor resources as an important component of the enterprise's resources ensure the efficient use of material resources, among other things, since labor resources include the work of highly qualified specialists, both workers and engineering and technical workers, as well as management.

Overall, for Kazakhstan to transition from a raw materials-based economy to an innovative one, as defined, in particular, in the Kazakhstan-2050 strategy, it is necessary to fundamentally change the approach to the formation and management of labor resources. This must be done not only at the state level, but also at the enterprise level, primarily large companies with significant

capabilities and resources to implement a new type of personnel policy. The modern approach to human resource management emphasizes the development of an organizational culture that promotes continuous training and development of personnel, team building, employee job satisfaction, and the development of motivation systems. Since now it is the serious attention of managers to the issues of developing such a new organizational culture, the formation of a unified system of organizational values that will shape such qualities of the team and each employee as knowledge, professionalism, loyalty to the organization, the ability to work in a team, and readiness for change. These qualities are still the main guarantees of improving the quality of production processes, improving the quality of products, and satisfying consumer demands. Therefore, integrating people's intelligence, developing their initiative, creativity, innovation, desire for success and independent action, decision-making, attracting professionals to the enterprise, and creating conditions for them that would promote their desire to work are important areas of human capital management strategy. That is why this work is devoted to issues of strategic management and planning of human resources (human capital).

Human capital planning covers the stages of strategic analysis of the external environment and the subsequent formation of personnel management policy or human capital management strategy. The use of individual energy efficiency principles in the formation of a competency model for a potential employee will ensure the initial stage of integration of energy efficiency principles and the HR policy of an industrial enterprise. Among the knowledge and skills required both in the field of daily work activities and in the development of projects for the technological modernization of production, one can note not only professional technical competencies, but also knowledge about the structure of the energy management system, on energy policy, principles and recommendations laid down in standards and current national legislation. The development of human capital is aimed, in our understanding, primarily at organizational learning; in addition, the development function must include investment in personnel, motivation for learning, and the search for promising areas of training (Esaulova, 2023:218). It is advisable to separate internal and external training programs by personnel categories, so that separate target groups will be identified within the company, each of which will receive a specific qualification in the field of energy management. For example, employees and workers involved in information preparation can study energy saving technologies in office premises, principles of energy saving in the workplace, and formulate internal proposals for improving efficiency indicators. The company's technical specialists, along with workers of varying skill levels in individual production areas, are focused on studying advanced energy-saving technologies and the potential for using alternative energy sources in production processes.

The most important task of developing the human capital of industrial and production personnel in the field of energy management is also the formation of an understanding of the system of performance indicators and methods for achieving target indicators. The implementation of training programs can take place in cooperation with specialized institutions, among which universities may occupy a priority place. In essence, a company's partner university can become a primary platform for developing competencies in energy-efficient implementation. Engaging talented young people to address energy management challenges is also part of human capital development. Personnel training technologies can be selected depending on the specific program and the level of human capital. They can range from traditional to active learning methods, including the use of business simulations and energy management team building technologies. The involvement of human capital is aimed at maximizing the use of the accumulated human organizational structure, facilitating effective processes of knowledge exchange and accumulation and creating an organizational culture in which initiatives in the field of energy management are encouraged. Engagement processes are facilitated by the use of various loyalty programs, technologies for constructing career advancement trajectories, individual educational trajectories, the inclusion of principles of openness in personnel management policies, etc. Thus, engagement processes are most closely linked to the energy efficiency strategy, as they allow maintaining employee motivation in the area at the highest possible level. Loyalty programs play a particularly important role in energy efficiency – traditionally, they include special offers for additional health insurance and participation in corporate programs, which can increase the motivation of managers at lower and middle management levels. Another promising direction is the

organization of youth groups working on energy conservation, formed according to the principles of quality circles. Human capital retention is focused on retaining talented employees who make a significant contribution to strategy implementation and demonstrate high performance, as well as on accumulating positive energy management experience.

The objective of studying attitudes towards work is to identify the mechanism of its formation and management. At the present stage, the first thing that is highlighted is the complete shift of all theoretical and practical problems of the “human factor” to the area of qualitative aspects of the development of the overall employee, as well as the effective management of human resources. The activation of the human factor should be considered from the point of view of not only the socio-psychological aspects of the work activity of the total employee, but also his personal characteristics.

Firstly, the relationship between the organizational and economic aspects of professional work activity has become more complex, becoming increasingly dependent on the human (subjective) factor, from the socio-psychological climate that has developed in the team, which can not only stimulate, but also hinder the development of labor potential, both of an individual employee and of the service sector enterprise as a whole. Secondly, the acceleration of the process of technological re-equipment dynamically changes labor activity and affects the realization of the labor potential of the total worker. Thirdly, the management system of service sector enterprises is often “late” in solving precisely human issues related to the variability of people’s social interests, That is, it is not the technical level of service sector enterprises that determines their economic efficiency, but the human factor, which embodies the organizational culture of the enterprise.

In our opinion, a systems approach to the interpretation of personnel management is the most appropriate, since through the interrelation of various elements of management influence, an optimal result can be achieved.

Table 1 - Concepts of enterprise human resources management

The purpose of human resource management	Contents of the concept	Principles of Human Resources Management	Authors
	Scientific organization of labor is a paradigm of technocratic management		
Finding and achieving the highest productivity of workers subordinate to a given manager	<ol style="list-style-type: none"> 1. Strict separation of managerial and executive functions. 2. The employee is a technical unit. 	<ol style="list-style-type: none"> 1. Personal responsibility. 2. Separation of spheres of labor. 3. Individual forms of labor organization. 4. Labor standards. 5. Authoritarianism. 	F. Taylor, G. Gunnt, L. Gilbert, G. Emerson
	Administrative management is a paradigm of technocratic management		
The creation of a holistic social organism capable of effectively solving problems and analyzing its development programs	Management as a universal process consisting of the functions of: foresight, organization, command, coordination and control	<ol style="list-style-type: none"> 1. Unity of leadership. 2. Subordination of interests. 3. Centralization and decentralization as measures. 4. Hierarchy of positions. 5. Encouraging initiative. 6. Unity of personnel. 	A. Fayol, J. Mooney, L. Urwick, A. Allan
	Bureaucratic management is a paradigm of technocratic management		
Improving the efficiency of public administration depends on the division of rights and responsibilities, career growth, and professional benefits	Strict job hierarchy with functional division of activities regarding public administration	<ol style="list-style-type: none"> 1. Functional division of labor. 2. Regulation of the activities of managers and subordinates. 3. Prioritization of professionalism and experience in careers. 	M. Weber, P. Blau, W. Brown, T. Scott, M. Crozier
	Human relations theory is a paradigm of economic psychology		

The purpose of human resource management	Contents of the concept	Principles of Human Resources Management	Authors
Improving the efficiency of a company's operations depends on economic and socio-psychological factors	The relationship between job satisfaction and managerial commitment. Managerial functions: economic and social.	1. Strengthening social and psychological methods. 2. Attention to the group needs of employees. 3. Encouraging informal communication.	E. Mayo, M. Follett, B. Rowntree
Improving control efficiency through linear programming	Economic and mathematical modeling of control processes	1. Use of computer technology. 2. Automation of management processes.	L. Bertalanffy, N. Wiener, L. Kantorovich, V. Novozhilov, P. Anokhin
Target management as a constantly operating system of goals	The priority of the art of managing people is substantiated	1. Targeted planning. 2. Labor organization. 3. Labor incentives.	P. Drucker, T. Peters, Lee Iacocca
Improving employee well-being and maximizing personal contributions to the efficient operation of firms	Management should be aimed at improving the performance of individual employees.	Activation of motivating factors: nature and content of work; recognition of employee achievements; creative self-realization.	R. Likert, D. MacGregor, F. Herzberg
Integrating the personal needs of employees with the goals and objectives of the corporation	Work to improve the management of the organization as a whole, rather than individual groups and departments	1. Refusal to search for a universal method of HR management. 2. Situational factors. 3. Personnel development.	J. Douglas, D. Guest, S. Klein, D. Hunt

Note: Compiled by the author based on (Molotkova et al., 2023:88).

The first doctrine emphasized the use of methods to optimize the organizational, technical, and social components of production systems. The second doctrine sought to uncover the importance of moral, psychological, and socio-organizational factors in the effective functioning of organizational personnel.

It is more difficult to provide a one-dimensional classification for the approaches used in HR management in the second half of the 20th century. The emergence of numerous schools, including national ones, in the field of HR management and the mutual exchange of experience call into question the definitive classification of these approaches.

At the same time, it can be said that the functional description of management subsystems does not fully reflect the content of the approach to enterprise personnel management. At the same time, the issue of providing the enterprise with qualified personnel corresponds to the scope of tasks outlined in the production plan and the required qualifications. Such tasks can be addressed using the enterprise's internal resources or by external labor market participants. The choice of course of action is largely determined by the qualifications of the resources available in the labor market. Therefore, these relationships are regulated by existing institutional norms in the labor market (social partnership and collective bargaining, minimum wage) and are supported by labor legislation.

Logically, the HR management system is divided into three subsystems: support, operation, and development. All processes and subsystems are based on information support. Kibanov A. Ya. interprets the personnel management system as: “a system in which personnel management functions are implemented, including a number of functional subsystems specializing in the performance of homogeneous functions in the most important areas of work with personnel” (Kibanov, 1997).

Each of the three subsystems can only function effectively when interacting with the other two. The goals, functions, and vertical and horizontal functional relationships of the HR management

system allow us to identify three main subsystems: support, operation, and development. The mutual coordination of personnel management subsystems ensures the most complete use of the enterprise's labor resources and is one of the conditions for increasing competitiveness in the market.

According to the conducted research, the directions in the functioning subsystem – labor organization and labor protection, in the development subsystem – motivational mechanisms for stimulating personnel activity are of particular importance for the reproduction of human resources of coal industry enterprises.

The impact on employee behavior through opportunities for professional development (career and training) is interconnected with both the functioning subsystem and the development subsystem. All enterprise HR management subsystems are based on information support.

One of the most comprehensive approaches presented in post-Soviet literature (Emikh, 2023:134) identifies the following subsystems within the HR management system, each of which implements a set of interconnected tasks:

- Working conditions subsystem.
- Labor relations subsystem.
- Personnel registration and accounting subsystem.
- Personnel planning, forecasting, and marketing subsystem.
- Personnel development subsystem.
- Remuneration and incentives subsystem.
- Legal support subsystem.
- Social infrastructure development subsystem.
- Organizational Management Structure Development Subsystem.

Thus, HR management concepts have significantly enriched enterprise management theory and, at the same time, brought about significant changes in the practical tools used. Being a scientific and methodological basis for the functioning of the enterprise's personnel management system, individual provisions of the considered concepts are effective when used in domestic enterprises.

No less important, but to date the least researched and in need of transparency and objective assessment is the issue of payments for harmful and hazardous working conditions in the workplace. Comprehensive inspections of the state of occupational safety at enterprises and in independent divisions are carried out by a commission of employees of the Kazakhmys Corporation's management apparatus with the aim of in-depth study of the entire range of safety issues:

- ensuring the safety of production processes and equipment operation;
- organizing preventive measures to prevent occupational injuries;
- increasing the responsibility of managers, specialists, and workers for compliance with occupational safety requirements;
- assessing air quality, disease rates, and sanitary, health, and medical services.

The Executive Director of Kazakhmys Corporation LLP and the Director of the Occupational Safety Department head the commissions for a comprehensive survey of the state of occupational safety in the corporation's structural divisions.

At the same time, it should be noted that currently the legislation establishes only some minimum acceptable guarantees when calculating certain payments. These include, for example, additional payment for work at night and overtime (not less than one and a half times the tariff rate (or official salary)), and on holidays and weekends (not less than double the rate). This means that such additional payments and allowances, unrelated to any particular area of activity, must be applied without fail. In all other matters concerning the establishment of these and other payments, organizations are granted complete independence in determining the procedure and amounts of payments. Under such conditions, trade unions have the right to demand higher compensation than provided by law.

The issue of establishing additional payments for work in unfavorable (difficult, harmful, or dangerous) working conditions deserves special attention. It was previously noted that the law no longer requires such payments. Under these circumstances, trade unions or other employee representative bodies are required to seek collective bargaining with employers to establish the

procedure and amounts for such additional payments.

The liberal approach to regulating the labor market, approved by legislative acts of the Republic of Kazakhstan, raises the question of the necessary degree of state intervention in reconciling the interests of employees and employers.

Many domestic researchers have already identified the fundamental conditions for the use of hired labor, which should be considered and enshrined in collective agreements.

According to modern concepts and trends in the development of labor relations, wages should reflect differences in the production and technical conditions of work performance. For those who work in production areas with higher physical and mental labor intensity, with working conditions that are harmful and dangerous to the life of the worker, an increased salary should be established in order to compensate workers for the increased expenditure of their vital energy (Kazakhmys, n.d.).

The current corporate standard serves as the organizational and methodological basis for a comprehensive system for improving work efficiency, the most important elements of which are occupational health and safety. Thus, the current regulatory and legal order determines the independence of corporations in diagnosing the range of harmful effects and hazards of the production process, as well as the degree of their deviation from normal conditions.

In practice, workplace certification is currently carried out by a service subordinate to the enterprise administration, which may raise doubts about its objectivity and adequacy to the actual state of affairs, since many harmful effects cannot be correctly assessed, even if labor inspectors are involved, without special laboratory measurements. Thus, there is a problem with information support for calculations and determining the amounts of additional payments and benefits applied in the collective agreement. In the current situation, neither trade unions nor other employee representatives can resolve this issue.

Accordingly, there is a need for state regulation of this process in terms of providing a transparent information base on harmful and hazardous working conditions in the corporation's workplaces. The system of one-time measurements conducted by the corporation's occupational safety department must be replaced by a system of external workplace audits, which should be carried out with the participation of labor inspectors, representatives of the regional department of labor, employment and social protection of the population, representatives of trade unions and the corporation's administration.

Since the current legislation of the Republic of Kazakhstan does not provide for economic methods of regulating allowances and compensation for harmful and hazardous working conditions, we propose an organizational mechanism for regulating working conditions in corporations, which will help trade unions form an objective information base for conducting negotiations within the framework of collective agreements and assigning benefits and allowances for harmful and hazardous working conditions (Figure 3) (Ukhanova&Shchegoleva, 2022:176).

The main result of our analysis based on the materials of Kazakhmys Corporation LLC is the conclusion about the need for an objective assessment of working conditions, harmfulness and danger of work at a specific workplace.

Currently, workplace certification is carried out by the corporation's occupational safety departments, while, in our opinion, an independent audit is necessary with the participation of representatives of the state labor inspectorate, the regional department of labor, employment and social protection of the population, and representatives of trade unions (or independent experts invited by them).

The results of the audit program implementation must be recorded in the enterprise passport, which must be kept by the executive bodies, primarily the Ministry of Labor, Employment and Social Protection, and serve as the basis for the payment of appropriate compensation and the establishment of benefits.

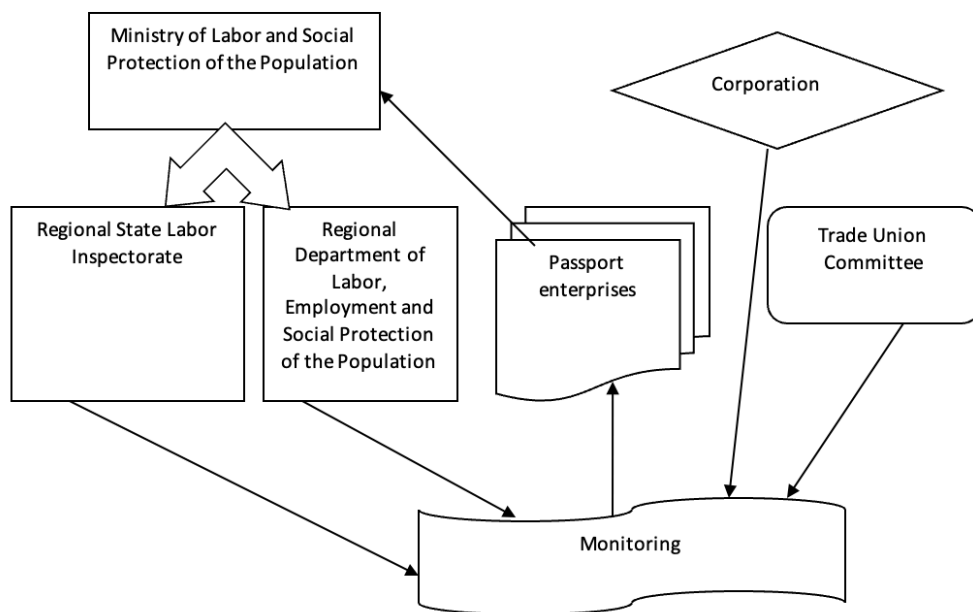


Fig 3. Organizational mechanism for regulating working conditions in corporations (Ukhanova&Shchegoleva, 2022:176)

Based on the enterprise passport, trade union representatives will receive objective arguments for coordinating the interests of employees and the enterprise administration.

Since state bodies, according to the current legislation, cannot use economic methods to regulate working conditions at the enterprise, We propose an organizational mechanism that, based on monitoring working conditions in the workplace, will provide an information base for trade unions to make changes to collective agreements.

An external audit should be a systematically conducted event according to the relevant program, which will form an objective picture of the state of working conditions in the workplace and identify deviations from sanitary and hygienic requirements. Based on the audit results, an enterprise passport must be drawn up, which must be available to enforcement agencies (state control bodies - the state labor inspectorate) and, necessarily, the Ministry of Labor, Employment and Social Protection. Thus, trade unions will have an objective information base for conducting negotiations within the framework of collective agreements and assigning benefits and allowances for harmful and hazardous working conditions.

Since payment for hazardous work must be made in accordance with the results of the current corporate passport, which must be updated regularly, the Ministry of Labor, Employment and Social Protection will be able to regulate this Enterprise Passport Ministry of Labor and Social Protection of the Population, Regional Department of Labor, Employment and Social Protection of the Population, Regional State Labor Inspectorate, Corporation, Trade Union Committee Monitoring the process and compliance of payments based on objective characteristics of workplaces. Based on the enterprise passport, trade union representatives will receive objective arguments for coordinating the interests of employees and the enterprise administration.

To periodically update the enterprise passport, it is necessary to establish a regular monitoring system that will make adjustments to the enterprise passport once a year in accordance with changes in technologies and equipment used.

Formulation of the scientific problem and novelty

Problem: The need to balance high production costs (billion tenge in 2024), declining net profit (by in 2024), and the need for investment in modernization amid copper price volatility.

Novelty: Analysis of the impact of ESG factors (environment, occupational safety) on Kazakhmys's operational efficiency in the face of declining metal grades in ore.

- In H1 2025, KAZ Minerals achieved its highest ever half yearly ore throughput of 50.6 Mt

in H1 2025 as the Group continues to focus on maximising operational efficiency.

- Copper production in H1 2025 decreased by 4% to 184 kt (H1 2024: 191 kt) due to an expected reduction in the average copper grades processed and temporarily lower recovery rates at Bozshakol due to the complex mineralogy of the ore.

- By-product output declined compared with the prior year as mining took place in areas with lower by-product content.

- Copper sales of 176 kt in H1 2025 were 4% below production, as higher volumes of copper concentrate were dispatched for toll processing at the Balkhash smelter. However, in the second quarter, sales volumes of 96 kt exceeded production volumes as the Group was reduced goods in transit.

Andrew Southam, Chief Executive Officer, said: “KAZ Minerals achieved its highest ever half yearly ore throughput of 50.6 Mt, with both Aktogay and Bozshakol achieving ore processing records in the year so far. These excellent results reflect the Group’s focus on enhancing operational capacity which has resulted in copper output of 184 kt in H1 2025.”

KAZ Minerals delivered 370 kt of copper in 2025, narrowing year-on-year output reduction to 3% despite the expected decline in copper grades. This reflects the Group’s strategy to sustain strong copper output through continuous improvements in operational efficiency.

Aktogay processed a record 62 Mt of sulphide ore in 2025, marking a new performance milestone and reinforcing KAZ Minerals’ position among the leading global copper producers.

Precious metal output increased in Q4 due to higher ore throughput at Bozshakol and better grades at East Region. Zinc output strengthened in Q4, driven by higher polymetallic ore grades at East Region, with full year production of 54 kt, up 26% from 2024.

Copper sales totalled 360 kt in 2025, 3% below production, resulting from temporary logistics constraints earlier in the year. Q4 sales rose 39% compared to Q3, reaching 107 kt. Some copper cathodes remained in transit at year-end and will be recognised in January 2026, contributing to a strong start to the new year.

Andrei Tretyakov, Chief Executive Officer, said: “KAZ Minerals completed another year of strong output, produced 370 kt of copper and 132 koz of gold in 2025. The Group is well positioned to respond to surging market demand for copper and precious metals. KAZ Minerals uses modern technology to support tailored mine-to-mill initiatives and continues to expand the existing mines. Management’s commitment to operational excellence enabled the Group to set a globally recognised record throughput at Aktogay.”

Financial Performance (2024-2025): Gross revenue in 2024 increased by (billion tenge), but net profit decreased to billion tenge.

Production Performance: In 2024, thousand linear meters were drilled, copper reserves increased by thousand tons, gold reserves increased by — tons.

Personnel: Salary indexation in 2025 by the average salary across the corporation will be thousand tenge.

Kazakhmys has signed a contract with the international consulting company JMJ Associates (USA), which will conduct a strategic audit of the industrial safety and occupational health system at all production sites. Nurakhmet Nuriyev, Chairman of the Board of Kazakhmys Corporation LLC, discussed cooperation details with JMJ representatives.

JMJ Associates (USA) specializes in developing corporate culture and leadership in safety. The goal of the joint project is to develop a sustainable safety culture at all Kazakhmys enterprises, where caring for life and health becomes a personal value for every employee (Kazakhmys, n.d.).

The project will focus on two key areas:

- Developing personal responsibility for safety – where leaders lead by example and an atmosphere of trust and openness is created within teams.

- Creating a safe work environment means eliminating risk factors and implementing systemic solutions that make it easier to follow rules than to break them.

"The project is designed to last several years. We will train employees at all levels, develop internal leaders, and develop safety ambassadors". "Our goal is to ensure that a safety culture continues

to develop within the company after the project is completed," noted Renat Salimgaliev.

JMJ expects this collaboration to strengthen trust between employees and management, reduce the number of injuries and incidents, and make safety a natural part of everyday work. As Nurakhmet Nuriyev noted, all levels of management are involved in the project – from line managers to top management. Based on the audit results, a long-term program will be developed to improve the maturity of the safety system by 2028–2029, so that compliance with the rules becomes a natural habit – like wearing a seat belt in a car.

Kazakhmys Company develops and stimulates personal and collective responsibility of employees for compliance with occupational health and safety requirements, and promotes and implements the widest possible implementation of advanced and international experience in the development of a sustainable motivational mechanism for safe behavior at work among employees, responsibility for their own life and health, as well as for the life and health of those working next to them. To enhance safety culture and motivate employees in industrial safety and occupational health, the company's divisions hold a quarterly "Safety Hour" event. The committee then decides on employee awards.

Conclusions:

Calculation-based conclusions: "Despite revenue growth for 2024, the decline in net profit is due to rising costs and capital expenditures."

Proposed measures: Optimization of production costs through digitalization (taking into account data) and sales diversification (given the decline in exports to China).

Increased investment in geological exploration ensures the company's sustainability.

Kazakhmys's primary goal is to improve plant operations and create a safe environment for its employees.

As evidence of the company's increased focus on occupational safety, its business units are scheduled to gradually achieve ISO 45001 certification (Kazakhmys, n.d.).

Implementing international standard requirements at enterprises will help continue efforts to:

- provide employees with workplaces that are safe and healthy
- preventing work-related deaths, injuries, and ill health
- providing a basis for risk management
- increasing employee engagement in occupational health and safety
- continuously improving the performance of the occupational health and safety (OHS) service.

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