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Economic Sciences

ORGANIZATIONAL AND ECONOMIC CHARACTERISTICS OF THE ENTERPRISE

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Introduction

In the current context of rapid economic growth and intensifying competition, a thorough examination of the organizational and economic aspects of businesses is crucial. The significance of this field stems from the need to enhance the performance of business entities, adapt to shifting external circumstances, digitalize manufacturing processes, and raise the standards for management reporting.

The organizational and economic features of a company enable us to pinpoint its strengths and weaknesses, identify areas for improvement in the management structure, production capabilities, and financial outcomes.

The objective of this research is to conduct a comprehensive analysis of the organizational and economic characteristics of a company, with the aim of identifying the factors that influence its sustainability and competitiveness.

To accomplish this objective, it is necessary to address the following tasks:

Examine the administrative framework and ownership model of the company;

Assess the available resources for production and the characteristics of the organizational structure;

Analyze the key economic indicators of the company;

Identify the factors that impact the company's performance;

Determine areas for improvement in the organizational and economic management system.

The originality of this work lies in its comprehensive approach to evaluating the organizational and economic aspects of a company, considering current trends in the business environment, such as digitalization, innovation, and sustainable development.

Literature review

The problems of organizational and financial features of businesses are a significant focus of study for both international and chinese scholars. Their research forms the theoretical and methodological framework for analyzing the internal structure and financial operations of businesses in the global economy.

Among the international scholars, M.Lazarević and M. M. Ružičić, the issues of organizational structure, management, and the internal environment of a business[1]. They emphasizes the connection between the form of an organization and its performance in the face of change, as well as the adaptability and innovation of companies.

A. Sama, presents a metaphorical approach to the study of organizations. His ideas enable us to examine companies from various perspectives — as machines, living beings, cultural entities, political systems, and more[2]. This approach deepens our understanding of organizational dynamics.

K. Agustian, in their work highlight the significance of strategic analysis in evaluating the organizational and economic health of a company[3]. They emphasize the importance of considering the external environment, financial performance, and the role of strategic planning in ensuring the company's long-term viability.

M. Iranmanesh's work is particularly noteworthy. He investigates the influence of organizational structure on the innovative activity of Chinese enterprises[4]. In his publications, he emphasizes the unique features of the Chinese corporate governance model and its impact on production and financial outcomes.

Another notable researcher is J.Zhang, Z.Chen, who focuses on the organizational effectiveness of enterprises in the digital age[5]. They explores the role of digital technologies in enhancing operational efficiency, adaptability, and sustainability in Chinese businesses.

The research presented here provides a comprehensive perspective on the analysis of organizational and economic characteristics of enterprises in various countries, considering contemporary challenges such as digital transformation, globalization, and innovation.

Research methodology

Two approaches were employed in this investigation:

The systems approach enables us to view an organization as a unified and open system, encompassing interconnected components such as production resources, management framework, financial streams, and interactions with the external environment. This approach aids in identifying the internal and external factors that impact the performance of an organization and provides an objective evaluation of its organizational and economic capabilities. The systems approach is particularly pertinent in a dynamic and unpredictable business landscape, where numerous interdependent variables must be considered.

The method of comparative analysis. The process of comparing and contrasting the organizational and economic metrics of a company over time, as well as against similar companies in the same industry, is known as benchmarking. This approach helps to identify discrepancies, strengths and weaknesses, and assess the company's competitiveness. The method involves analyzing financial ratios, cost structure, labor productivity, profitability, and other key indicators.

When used together, these methods provide a comprehensive and unbiased view of the company's performance, allowing it to make informed decisions about future development strategies.

Results and discussion

In the course of our investigation into the organizational and financial aspects of the company, have come to the following conclusions.

The application of system analysis allowed the company to be viewed as a complex and interconnected entity operating within the context of its external and internal environment. This approach not only enabled the identification of individual components such as the organizational structure, production capacity, personnel, and financial resources, but also provided a deeper understanding of how these components interact with one another to form a cohesive operational system.

A particular focus was placed on examining the crucial connections between:

Management decisions and production outcomes: The impact of operational and strategic management on the quantity, quality, and cost of products was assessed.

Financial resources and investment activities: The influence of financial allocation within the company on its innovative development and equipment modernization was explored.

The human capital and operational effectiveness of business processes — it has been demonstrated that the level of expertise, motivation, and engagement of employees directly influences the performance and resilience of an organization.

The flow of information and the ability to manage it — we explored how the presence or absence of effective communication channels within a company affects the speed of decision-making and the ability to adapt to changes in the external environment.

Through this comprehensive approach, we were able to identify internal resources that had not been fully utilized, as well as pinpoint areas that were hindering progress. For instance, in some cases, we discovered a lack of synchronization between strategic planning and operational management, which resulted in resource wastage and reduced managerial agility. Consequently, the system analysis revealed that the company cannot be accurately evaluated solely based on individual metrics or functions. Only by considering the company as a whole, including its structure, interconnectedness, and internal processes, can we gain a comprehensive understanding of its current state and potential for growth. This underscores the importance of a holistic approach in management practices and the development of a sustainable strategy for the company.

The comparative analyses, in its turn, allowed for an assessment of the performance of the organizational and economic framework of the company under scrutiny in relation to the industry's top performers. For the purpose of this analysis, two globally renowned companies were chosen — Toyota Motor Corporation (Japan) and Tesla Inc. (USA) — which exemplify distinct organizational approaches and management philosophies, both of which are highly competitive in the global automotive sector(table 1).

Table 1. Comparative analyses: Toyota vs Tesla

Indicator	Toyota Motor Corporation	Tesla Inc.
Organizational Structure	Hierarchical, with a rigid vertical management system	More flexible, project-matrix structure focused on innovation
Production System	Toyota Production System (TPS), lean manufacturing	Emphasis on automation and technological innovation
Financial Stability	High profitability, stable revenue	Rapid revenue growth, but high market sensitivity
Innovation Strategy	Gradual improvements and process optimization	Radical innovation and rapid product launches
Personnel Management	“Kaizen” culture, team-based approach, long-term employment	Dynamic approach, result-oriented with focus on tech expertise
Digitalization of Processes	Gradual integration of digital solutions	Aggressive digitalizatio

This source was compiled based on the data [6-8]

The comparative examination uncovered significant aspects of organizational and economic governance. Toyota, a traditional industrial powerhouse, emphasizes steadiness, standardization, and ongoing enhancement, which guarantees resilience even in the face of external disruptions[9].

On the other hand, Tesla, a quintessential representative of the new technological wave, exhibits adaptability, a high degree of innovation, and a willingness to take risks, which contributes to swift market penetration but is accompanied by volatility in financial performance[10].

The study thus confirmed that the organizational and economic characteristics of a company are closely tied to its strategic development model, corporate culture, the level of digitalization, and management priorities. The choice of management approach is not solely determined by the size of the business, but also by its growth model: stability and quality versus speed and innovation.

Based on the results of the systematic and comparative analysis, the following key findings can be summarized. The systematic approach allowed for a thorough examination of the company as an integrated socio-economic entity, revealing the interdependencies between management, operations, finances, and human resources. This comprehensive understanding of the company's current state enabled us to pinpoint areas for enhancement.

A comparative study of Toyota and Tesla, two companies that have achieved success, reveals that successful businesses can adopt vastly different organizational structures, ranging from rigid and hierarchical to flexible and innovative. Nevertheless, the key to their long-term viability lies in the coherence of their internal framework, strategic objectives, and capacity to respond to external pressures. Consequently, the efficacy of an organizational and economic model is contingent upon a company's capacity to embrace innovation, manage resources, and foster a robust corporate culture.

Conclusion

The organizational and economic features of a company are the key to a thorough evaluation of its operations, identifying strategic and operational reserves, and justifying the paths for sustainable growth. In the era of digitalization, globalization, and intensifying competition, adaptable management structures, innovative methods, and systematic resource management are becoming increasingly crucial.

The research conducted has demonstrated that the success of a company is not solely determined by its financial performance, but also by the quality of its internal organization, the effectiveness of its business processes, and its capacity for adaptation. The development of a well-balanced and adaptable organizational and economic model becomes essential for enhancing the company's competitiveness and sustainability in the long term.

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ЎЗБЕКИСТОН СУҒУРТА БОЗОРИ МУАММОЛАРИ ВА РИВОЖЛАНИШ ЙЎНАЛИШЛАРИ

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Сўнгги йилларда Ўзбекистонда суғурта бозори ижобий ривожланиш тенденцияларини кўрсатмоқда. Буни ўтказилган таҳлиллар асосида қуйидаги йўналишларда кўриш мумкин.

Биринчидан, соҳанинг ҳуқуқий асослари мустаҳкамланди, рақобатбардош суғурта бозорини ривожлантиришга қаратилган бир қатор меъёрий-ҳуқуқий ҳужжатлар қабул қилинди.

Иккинчидан, суғурта ташкилотлари сони ортиши кузатилди — 2017 йилда Ўзбекистонда 27 та суғурта компанияси фаолият юритган бўлса, 2023 йилга келиб, уларнинг сони 38 тага етди. Ҳаёт суғуртаси соҳасида солиқ имтиёзларининг бекор бўлиши натижасида учта суғурта компаниясининг ўз фаолиятини тўхтатиши ҳамда умумий суғурта соҳасида баъзи суғурта компаниялари лицензияларининг бекор бўлиши натижасида 2024 йилда суғурта компаниялари сонида камайиш юз бериб, уларнинг сони 33 тага тушди.

2023 йилда суғурта мукофотларининг умумий ҳажми 8 059,7 млрд. сўмни ташкил этиб, 2022 йилдаги кўрсаткичга нисбатан 29,3 фоизга ўсган. Бунда ихтиёрий суғурта турларидан келиб тушган суғурта мукофотлари ҳажми 2023 йилда 92% ни ташкил қилган. 2024 йилда тўпланган суғурта мукофотларининг умумий ҳажми 9 770,1 млрд. сўмни ташкил этиб, 2023 йилдаги кўрсаткичга нисбатан 21,2 фоизга ўсган, яъни 2023 йилга нисбатан ўсиш даражжасида бироз пасайиш юз берган. Бунда ихтиёрий суғурта турларидан келиб тушган суғурта мукофотлари ҳажми 92 % ни ташкил қилган. 2024 йилда тўпланган суғурта мукофотлари ҳажми 2016 йилга нисбатан 14,1 марта ошган (1-жадвалга қаранг).

Суғурта полислари сони 2024 йилда 10,5 млн.тага етди ва шартномалар фойдаланувчилар учун қулай электрон шаклга ўтказилди. 2024 йилда суғурта компаниялари устав капитали 2017 йилдагига нисбатан 9,3 баравар ўсиб, 2 964 млрд. сўмни ташкил қилди. 2023 йилда мижозлар учун суғурта ҳодисалари бўйича тўловларининг умумий миқдори 2,0 трлн. сўмдан ортиқни ташкил қилди ва бу 2017 йилдагига нисбатан 9,6 баравар кўп дегани. Ушбу кўрсаткич 2024 йилда 2,2 трлн. сўмдан ортиқни ташкил этди.

Ҳудудлардаги таркибий тузилмалар сони 2017 йилдагига нисбатан 1,5 баравар ошди ва деярли 2 мингтага етди. Барча ҳудудларда 15,4 минг нафар ходим ва суғурта агентлари учун барқарор иш ўринлари яратилди. Ҳозирда суғурта компаниялари турли йўналишларда 110 дан ортиқ турдаги суғурта маҳсулотларини таклиф қилмоқда.

Учинчидан, соҳада амалга оширилган қатор ислоҳотларга қарамасдан, экспертларнинг фикрича, мамлакат суғурта бозори тўлиқ шаклланиб улгурмаган.

Мутахассисларнинг фикрича, мамлакат суғурта хизматлари бозоридаги қатор тизимли муаммолар сақланиб қолмоқда:

а) суғурта бадаллари ҳажмининг пастлиги;

б) аҳоли орасида суғурта хизматларига ишончсизлик билан қараш мавжудлиги;

в) “рақамлаштириш” жараёнларининг тугалланмагани;

г) янги авлод кадрларини тайёрлашга етарлича эътибор қаратилмаётгани;

д) юқори географик концентрациянинг мавжудлиги, яъни суғурта ташкилотларининг аксарияти Тошкент шаҳри ва Тошкент вилоятида жойлашган.

Аҳоли жон бошига суғурта мукофотлари 2022 йил бўйича жаҳонда ўртача $874 ни ташкил қилган бўлса, давлатлар кесимида — Қозоғистонда $92, Беларусда $77, Озарбайжонда $50, Арманистонда $32, Ўзбекистонда $15,5 ни ташкил этди. 2024 йилга келиб мамлакатимизда ушбу кўрсаткич 20 АҚШ долларидан ортиқроқни ташкил этди.

Маълумотларга кўра, айрим суғурта хизматлари мажбурий бўлишига қарамай, иш берувчиларнинг атиги 7,2%, ташувчиларнинг 8,6% хавфли объектларнинг 1,8 фоизи ва қурилиш-монтаж ишларининг 9,2% суғурталанган.

Ўзбекистон суғурта тармоғида 2016 йилга қадар хусусий суғурта компаниялари сон жиҳатидан катта бўлсада, кўрсатилаётган суғурта хизматлари ҳажмида уларнинг ҳиссаси давлат мулкига асосланган ва давлат мулки мавжуд бўлган суғурта компанияларига нисбатан паст даражада эди. 2016 йилдан 2018 йил оралиғида давлат мулкига асосланган суғурта компанияларининг ҳиссаси 64 % дан 28 % гача пасайди. 2016 йилда суғурта компаниялари томонидан тўпланган жами суғурта мукофотлари ҳажми 692,6 млрд. сўмни ташкил этган бўлса, 2024 йилга келиб унинг ҳажми 9 770,1 млрд. сўмни ташкил қилди, яъни 14,1 баробар ўсиш юз берди. Натижада суғурта хизматларининг мамлакат ЯИМдаги ҳиссаси 2016 йилдаги 0,35 % дан 2024 йилда 0,67 % га ортишига олиб келди (1-жадвалга қаранг). Аммо шуни таъкидлаш керак, 2024 йилда суғурта мукофотларининг ЯИМдаги ҳиссаси кўрсаткичида 2023 йилга нисбатан пасайиш юз берган, яъни ушбу кўрсаткич 0,76 % дан 0,67 % га тушган.

1-жадвал

Ўзбекистон суғурта бозорида йиғилган суғурта мукофотлари ва унинг ЯИМга нисбати динамикаси[1] *(млрд сўм)*

	Йиллар						
	2016	2020	2021	2022	2023	2024	2016/ 2024 ўсиш/ камайиш (*марта*)
Жами суғурта мукофотлари	692,6	2 213,7	3 733,0	6 231,7	8 059,7	9 770,1	+14,1
ЯИМ	199325,0	580200,0	734600,0	888340,0	1квадрил. 066,5 трлн.сўм	1квадрил. 454,6 трлн.сўм	+7,3
ЯИМда суғурта мукофотлари ҳиссаси	0,35	0,38	0,51	0,70	0,76	0,67	+0,32%
Аҳоли сони	31 575,3	34 558,9	35 271,3	35 421,5	36 799,8	37 543,2	+118,9 %
Киши бошига тўғри келган суғурта мукофоти	21 935	64 056	105 837	175 930	219 015	260 236	+11,9
Тўланган суғурта қопламалари	130,5	732,3	1235,0	2596,9	2022,1	2204,5	+16,9
Суғурта қопламаларининг суғурта мукофотларига нисбати	18,84	33,11	33,08	41,70	25,09	22,56	+3,72 %

1-жадвални чуқурроқ таҳлил қиладиган бўлсак, ушбу жадвалда жами 7 та кўрсаткич бўйича маълумотлар келтирилган бўлиб, шундан 5 таси суғурта соҳаси кўрсаткичлари. Улардан иккитасида – ЯИМда суғурта мукофотлари кўрсаткичида ҳамда суғурта мукофотларига нисбатан тўлаб берилган суғурта қопламаларида пасайиш юз берган, қолган бешта кўрсаткичда ўсиш бўлсада, олдинги йилларга ннисбатан ўсиш даражаси пасайган. Бизнинг назаримизда ушбу ҳолатга иккита омил таъсир кўрсатган: биринчиси ҳаёт суғуртаси тармоғида амал қилаётган солиқ имтиёзининг бекор қилиниши натижасида ушбу тармоқ хизматлари ҳажмининг кескин тушиб кетиши бўлса, иккинчи омил бозорда фаолият кўрсатаётган суғурта компаниялари сонининг турли сабаблар билан камайишидир (асосан қонунчиликда йўл қўйилган камчиликлар туфайли

[1] http://www.mf.uz сайти маълумотлари асосида муаллиф томонидан тайёрланган.

лицензиянинг бекор қилиниши). Буни қуйидаги жадвал маълумотларидан кўриш мумкин (2-жадвалга қаранг). Ушбу жадвалда келтирилганидек, суғурта полисларини фақат онлайн сотишнинг белгиланиши ва бундай имкониятга аксарият суғурта агентлари эга эмаслиги, шу билан бирга, мажбурий суғурта турлари бўйича воситачилар учун комиссион тўловларнинг бекор қилиниши туфайли 2023 йилда суғурта агентлари сонининг кескин камайиши юз берган эди. 2024 йилда суғурта агентлари сонида ва шу билан бирга суғурта брокерлари сонида ўсиш юз берганлигини ижобий ҳолат дея баҳолаш мумкин. Ассистанс ташкилотлар сони жуда кам бўлиб турган бир ҳолатда, уларнинг янада камайиб бораётганлигини суғурта компаниялари мижозларга қўшимча қулайликлар яратиш орқали улар сонини кўпайтиришга, суғурта хизматларига бўлган қизиқишларини ошириш масаласида ишлар олиб борилмаяпти деб баҳолаш мумкин. Суғурта компаниялари бўлинмалари сонининг камайиши суғурта компанияларининг камайиши билан боғлиқ деган хулосани беради.

2-жадвал

Ўзбекистон суғурта бозори инфратузилмаси субъектлари сонининг йиллар давомида ўзгариш динамикаси[2]

Субъектлар	2016	2017	2020	2021	2022	2023	2024	Ўсиш/ камайиш
Суғурта компаниялари	26	27	41	42	41	38	33	+7
Суғурта брокерлари	3	3	5	5	7	8	11	+8
Суғурта агентлари	5800	7200	8870	9536	9155	4736	4804	-996
Ассистанс	8	10	9	9	7	5	5	-3
Сюрвеер	6	8	7	7	9	11	11	+5
Аджастер	4	6	6	6	8	10	10	+6
Актуарий	4	4	5	5	5	5	5	+1
Суғурта компаниялари бўлинмалари	1123	1284	1873	1966	1967	1910	1870	+747

Суғурта компаниялари томонидан иқтисодиёт соҳаларига йўналтирилаётган инвестициялар ҳажми йилдан-йилга юқори даражада ошиб бормоқда. 2016 йилда улар томонидан йўналтирилган инвестициялар ҳажми 867,5 млрд. сўмни ташкил этган бўлса, 2024 йилда иқтисодиёт соҳаларига йўналтирилган инвестициялар ҳажми 7,5 баравар ошиб, салкам 6 543 млрд. сўмни ташкил этди (3-жадвалгап қаранг). Аммо ушбу масалада шуни таъкидлаш керак, инвестиция инструментларининг турли-туманлиги етарли эмас, натижада инвестиция маблағларининг диверсификацияси таъминланмаяпти. Инвестиция маблағларининг асосий қисми банк депозитларига йўналтирилиб, ушбу йўналишдаги инвестиция маблағларининг ҳиссаси ошишда давом этмоқда ва ўсиш даражаси охирги 2024 йилда юқори бўлган (70,1 %). Мантиқан олиб қараганда, суғурта компаниялари вақтинчалик бўш маблағларни даромад олиш учун банкларга йўналтираяпти, ўз ўрнида банклар даромад олиш мақсадида ушбу маблағларни юқори фоиз билан кредитга йўналтириб, олинган даромаддан суғурта компанияларига олдиндан белгиланган фоиз

[2] IMDA.UZ маълумотлари асосида муаллиф томонидан тайёрланган

кўринишидаги даромадни тўламоқда. Ушбу тизим кредит бозорида фоизлар даражасининг ошишига сабаб бўлмоқда. Шунинг учун, тадбиркорлар ва аҳолига тақдим этилаётган кредит фоизларини камайтиришга эришиш мақсадида маълум йўналишлар бўйича суғурта компанияларига тўғридан-тўғри кредит фаолияти билан шуғулланиш ҳуқуқини бериш зарур деб ҳисоблаймиз (ипотека ва лизинг кредитлари). Инвестиция сифатида йўналтирилаётган маблағлар ҳажми ўсиб бораётган шароитда баъзи соҳаларга йўналтирилган маблағлар ҳажмида пасайиш юз берганлигини диверсификацияни таъминлаш масаласининг янада эътибордан четда қолаётганлигини кўрсатади. Ушбу кўрсаткичлар сифатида қимматли қоғозларга йўналтирилган инвестициялар, кўчмас мулк сотиб олиш, ташкилотлар устав фондида иштирок этиш ва бошқа инвестициялар кўрсаткичларидир (3-жадвалга қаранг).

3-жадвал

Ўзбекистон суғурта компаниялари томонидан инвестиция объектларига йўналтирилган маблағлар динамикаси[3] (млрд.сўмда)

Кўрсаткичлар	Йиллар					
	2016	2020	2021	2022	2023	2024	2016 йилга нисбатан 2024 йилда *ўсиш (+) ёки камайиш (-)* (марта)
Инвестициялар, ш.ж.	867,5	3 382,7	3 746,7	4 781,7	6 149,9	6 542,6	+7,5
1. Банк депозитлари	390,4	1 818,9	2 208,6	2 896,0	4 037,4	4 583,8	+11,7
Банк депозитлариинг ҳиссаси, %	45,0	53,8	58,9	60,6	65,6	70,1	+25,1 %
2. Қимматли қоғозлар	359,1	958,6	1 096,0	1287,9	1 357,5	1 303,8	+3,6
3. Қарз бериш	69,4	42,1	47,5	60,8	46,9	95,4	+1,4
4. Кўчмас мулк	50,3	285,3	247,3	358,9	539,5	452,8	9,0
5. Ташкилотлар устав фондидаги иштироки	60,7	272,1	142,2	118,2	134,7	98,5	+1,6
6. Бошқа инвестициялар	1,7	5,7	5,1	29,3	34,0	8,4	+4,9

2016 йилда ҳаёт суғуртасининг жами суғурта хизматларидаги ҳиссаси 9 % ни ташкил этган бўлса, 2022 йилда унинг ҳиссаси 25,4 % га етди. Аммо 2023 йилда унинг ҳиссаси кескин тушиб 4% ни ва 2024 йилда 3 % ни ташкил қилди. Ушбу ҳолатнинг сабаби Солиқ кодексига киритилган ўзгартириш бўлиб, унга кўра, 2023 йил 1 апрелдан жисмоний шахсларнинг ҳаётини узоқ муддатга суғурталаш учун тўлаган суғурта мукофотлари бўйича даромад солиғи имтиёзи бекор қилинди. Бундан ташқари, амалдаги ҳаёт суғуртасига ихтисослашган суғурта компанияларининг фойда солиғига ўрнатилган 50 фоизлик чегирма ҳамда Иш берувчи томонидан ўз ходимлари учун бахтсиз ҳодисалардан эҳтиёт шарт суғурта қилиш ва тиббий суғурта турлари бўйича тузилган суғурта шартномалари учун тўланган суғурта мукофотлари бўйича даромад солиғи имтиёзларининг муддати тугаганлиги туфайли ҳаёт суғуртаси бўйича хизматлар ҳажми кескин камайиб кетди.

[3]http://www.mf.uz веб-сайти маълумотлари асосида муаллиф томонидан ишлаб чиқилган.

Ҳаёт суғуртаси ижтимоий ҳимоя воситаси бўлиб, ушбу суғуртани ривожлантириш билан давлат ўз фуқароларининг ижтимоий ҳимоясини таъминлайди. Ҳаёт суғуртасининг иқтисодиёт учун энг фойдали жиҳати шундан иборатки, ҳаёт суғуртаси ривожланган шароитда катта ҳажмдаги ва узоқ муддат инвестиция сифатида фойдаланиш мумкин бўлган маблағларнинг тўпланишини таъминлайди. Ушбу маблағларни иқтисодиёт соҳаларига узоқ муддатга инвестиция сифатида йўналтирилади. Шу сабабдан ҳам дунёнинг аксарият мамлакатларида ҳаёт суғуртаси бўйича турли кўринишдаги имтиёзлар амал қилади. Имтиёзлар айниқса Ўзбекистон каби иқтисодиёти энди ривожланаётган, аҳоли даромадлари ўртача бўлган мамлакатлар учун зарур ҳисобланади.

УДК. 332.1

ВЛИЯНИЕ ЗЕЛЕНЫХ ОБЛИГАЦИЙ НА РАЗВИТИЕ ВОЗОБНОВЛЯЕМОЙ ЭНЕРГЕТИКИ В РК

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Аннотация. В условиях глобального перехода к экологически чистой энергетике зелёные облигации становятся важным инструментом финансирования проектов в области возобновляемых источников энергии. Целью настоящего исследования является анализ влияния зелёных облигаций на развитие возобновляемой энергетики в Республике Казахстан. В работе рассмотрены основные механизмы функционирования зелёных облигаций, проанализированы тенденции их использования на казахстанском рынке, а также приведены примеры реализации проектов в сферах солнечной энергии и энергии ветра при поддержке данного финансового инструмента. Исследование основано на анализе нормативно-правовой базы, статистических данных и материалов международных организаций. Полученные результаты свидетельствуют о том, что зелёные облигации способствуют привлечению инвестиций в солнечную и ветровую энергию и играют важную роль в развитии экологичной энергетики в стране.
Ключевые слова: зелёные облигации, возобновляемая энергия, зеленое финансирование, инвестиции, солнечная энергия, энергия ветра.

Abstract. Amid the global transition to clean energy, green bonds have become an important tool for financing renewable energy projects. This study aims to analyze the impact of green bonds on the development of renewable energy in the Republic of Kazakhstan. The paper examines the core operational mechanisms of green bonds, analyzes their usage trends in the Kazakhstani market, and provides examples of projects in the fields of solar and wind energy supported through this financial instrument. The research is based on the analysis of legal frameworks, statistical data, and reports from international organizations. The findings indicate that green bonds help attract investments in solar and wind power and play a key role in the development of environmentally friendly energy in the country.
Keywords: green bonds, renewable energy, green finance, investment, solar energy, wind power.

Сегодня актуальными становятся зелёные облигации – инструмент, который позволяет привлекать инвестиции специально под “зелёные” проекты.

Ветер, солнце, вода – всё это может давать энергию, не загрязняя воздух и не разрушая экосистемы. Но, как перейти на возобновляемые источники энергии (ВИЭ), если строительство солнечных и ветряных станций стоит миллионы, а порой и миллиарды долларов. Откуда привлечь инвестиций, чтобы развивать экологически чистую энергетику?

Обычные облигации – это когда компания или государство выпускает ценные бумаги, продаёт их инвесторам, а потом через несколько лет возвращает деньги с процентами. По сути, это способ занять денежные средства на развитие бизнеса или инфраструктуры.

Зелёные облигации работают точно так же, но с одним важным условием: средства, собранные таким способом, могут быть потрачены только на проекты, которые помогают экологии. Это могут быть солнечные и ветровые электростанции, очистка водоёмов, строительство энергоэффективных зданий или развитие электробусов в городах.

ВИЭ – это возобновляемые источники энергии, которые не иссякают и не вредят окружающей среде:

- солнечная энергия – панели улавливают свет и превращают его в электричество.
- ветер – огромные ветряные турбины используют силу воздушных потоков.
- гидроэнергия – реки и водохранилища вращают турбины, вырабатывая энергию.
- биогаз и геотермальные источники – переработка органических отходов и использование тепла земли.

Республика Казахстан, страна богатая нефтью, углём и газом, а значит, легко продолжать традиционный путь. С другой – мировые рынки меняются, и страны, которые не перейдут на чистую энергетику, рискуют остаться в стороне. В основе теоретического обоснования зелёных облигации лежат принципы целевого использования привлечённых средств, прозрачности отчетности и соответствия высоким экологическим стандартам [1]. Эти характеристики позволяют инвесторам оценивать потенциальные экологические и финансовые риски, что является важной предпосылкой для формирования доверия к данному виду инвестиций.

Современные теории устойчивого финансирования подчеркивают значимость интеграции экологических, социальных и управленческих критериев (ESG) в процесс принятия инвестиционных решений [2]. Согласно этим моделям, зеленые облигации не только способствуют привлечению средств, но и стимулируют инновационные изменения в энергетическом секторе. Особенно актуально это для стран, стремящихся к переходу от традиционных источников энергии к возобновляемым, что позволяет снизить углеродный след и обеспечить устойчивость экономического развития [3].

В контексте Республики Казахстан применение зеленых облигаций приобретает особое значение. Экономика страны, исторически зависимая от экспорта углеводородов, сейчас находится на этапе диверсификации, и зеленые облигации становятся важным инструментом привлечения инвестиций в проекты возобновляемой энергетики. Теоретические подходы к анализу влияния зеленых облигаций на энергетический сектор опираются на модели трансформации энергетической системы, где финансовые инструменты выступают катализаторами перехода к более экологичным технологиям [4]. В этих моделях государственная поддержка и нормативно-правовое регулирование играют ключевую роль, снижая инвестиционные риски и повышая прозрачность распределения финансовых потоков.

Анализ отечественной и зарубежной научной литературы показывает, что успешное применение зеленых облигаций связано с уровнем развития финансовых рынков и качеством правового обеспечения. В странах с развитой инфраструктурой устойчивых финансов зеленые облигации способствуют активизации проектов в области солнечной, ветряной и гидроэнергетики, что подтверждается исследованиями международных организаций, таких как Всемирный банк и Европейский банк реконструкции и развития [5]. При этом теоретическая база зеленых облигаций включает элементы оценки социального и экологического эффекта инвестиций, что позволяет учитывать не только экономическую, но и экологическую эффективность проектов [6].

Согласно концепции «зеленого финансирования», применение зеленых облигаций способствует не только привлечению инвестиций, но и формированию долгосрочных стратегий устойчивого развития, что особенно важно для стран, сталкивающихся с вызовами изменения климата. В этой парадигме особое внимание уделяется прозрачности использования финансов, что позволяет минимизировать риск «зеленого камуфляжа» и повышать доверие со стороны инвесторов [7]. В Казахстане, где нормативная база по зеленым финансам активно развивается, использование зеленых облигаций открывает новые возможности для технологического прогресса и перехода к более чистым источникам энергии.

Зеленые облигации выступают катализатором для финансирования проектов в области возобновляемой энергетики. Привлечение средств посредством данного инструмента способствует развитию солнечной, ветряной и гидроэнергетики, одновременно снижая углеродный след и повышая энергетическую независимость страны. Однако динамика их влияния обусловлена комплексом факторов: от устойчивости нормативной базы до прозрачности отчетности по использованию инвестиций.

В Республике Казахстан, несмотря на положительную динамику инвестиций, отмечаются следующие проблемы: низкая ликвидность рынка, ограниченное число эмитентов, несовершенство нормативного регулирования и риск «зеленого камуфляжа». Эти факторы снижают доверие инвесторов и ограничивают масштаб финансирования. В то же время государственная поддержка, интеграция с международными стандартами и инновационные подходы к выпуску новых инструментов (например, устойчивых облигаций, привязанных к экологическим показателям) открывают перспективы для ускоренного развития рынка зеленых облигаций и, как следствие, возобновляемой энергетики.[8]

Таблица 1. Объем зеленых финансов и инвестиции в ВИЭ в Казахстане. [9-15]

Показатель	Значение/ Данные	Источник/Комментарий
Общий объем зеленых финансов (на конец 2023)	150,2 млрд тенге	Министерство экологии, Национальный банк РК
Из них облигации	112,9 млрд тенге	-
Кредиты	37,3 млрд тенге	-
Сумма дебютного выпуска зеленых облигаций (2020)	~200 млн тенге Выпущены фондом «Даму»	-
Привлеченные инвестиции через МФЦА (2024)	3,1 млрд долларов США	70% - зеленые инструменты
Инвестиции в ВИЭ, 2022	180 млрд тенге (~390,89 млн долларов США	Министерство энергетики
Инвестиции в ВИЭ, 2023	199,8 млрд тенге (~437,86 млн долларов США	-
Инвестиции в ВИЭ, 2024	13,7 млрд тенге (~29,18 млн долларов США	-
Доля ВИЭ в энерго структуре, 2022/2024	4,5% / 6,43%	KEGOC, Министерство энергетики
Прогнозируемая мощность ВИЭ к 2030	8 605,71 МВт	Для достижения 15% доли ВИЭ
Необходимые инвестиции для достижения цели (2030)	$7,156-11,4 млрд	IRENA, прогнозы Минэнерго

Несколько лет назад Казахстан начал выпускать зелёные облигации, чтобы привлекать деньги именно на “зелёные” проекты.

За 2021-2024 года Национальным управляющим холдингом «Байтерек» на развитие возобновляемых источников энергии и экологических проектов было направлено более 7 млрд тенге. Аналогично, по линии Азиатского банка развития 14 млрд. тг. и по линии Евразийского банка развития 25 млрд. тг. Фонд «Даму» выделил 200 млн тг и A-cars 500 млн. тг. см. рисунок 1

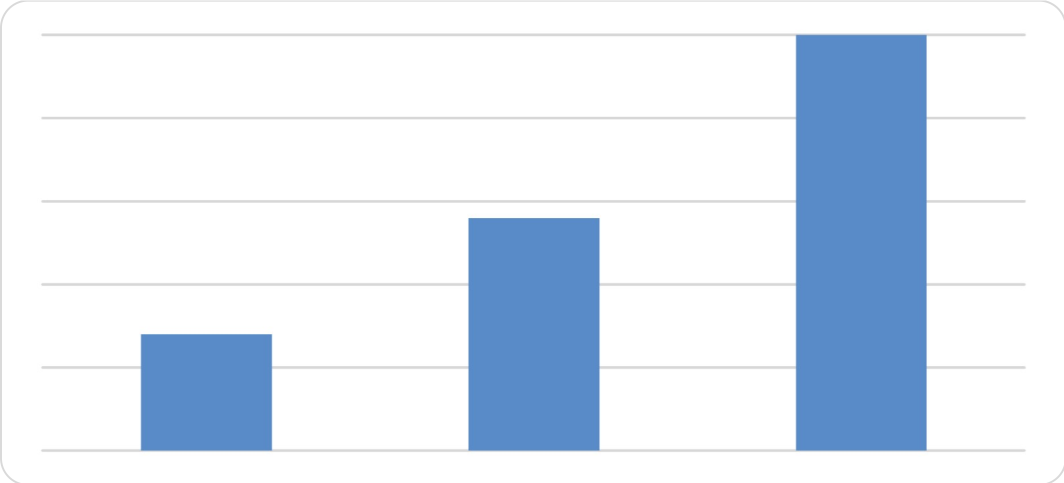

Рисунок 1. Обзор выпусков зеленых облигаций в РК и направления их использования [16-20]

Одни из этих проектов связаны с ветрами. Казахстан обладает огромным ветроэнергетическим потенциалом, особенно в степных и горных регионах. Согласно исследованиям IRENA (Международного агентства по возобновляемым источникам энергии), наиболее перспективные зоны для строительства ветропарков:

- Жамбылская область (Кордайский район – скорость ветра до 9-12 м/с)
- Актюбинская область (7-10 м/с в степных районах)
- Мангистауская область (прибрежные ветра Каспия – 6-9 м/с)
- Восточно-Казахстанская область (горные перевалы – 5-8 м/с).

В республике функционирует значительное количество ветроэлектростанций (ВЭС), способствующих развитию возобновляемой энергетики в стране. Ниже представлены некоторые из действующих ВЭС:

Таблица 2. Действующие ветроэлектростанции (ВЭС) в Казахстане

Название ВЭС	Регион	Мощность (МВт)	Год ввода в эксплуатацию
Кордайская ВЭС	Жамбылская область	21	2014
Ерейментауская ВЭС	Акмолинская область	45	2015
Жанатасская ВЭС	Жамбылская область	100	2021
ВЭС «Бадамша»	Актюбинская область	96	2020–2022
ВЭС «Ыбырай»	Костанайская область	50	2021
ВЭС «Абай-1»	Область Абай	100	2022
ВЭС «Абай-2»	Жетысуская область	50	2023
ВЭС «Шелек»	Алматинская область	60	2022
ВЭС «Борей Энерго-1»	Жамбылская область	50	2023
ВЭС «Борей Энерго-2»	Жамбылская область	50	2023
ВЭС «EnergoTrust»	Жамбылская область	50	2023
ВЭС «EcoWatt AKA»	Жамбылская область	50	2023
ВЭС «Шокпар»	Жамбылская область	100	2024

Общая установленная мощность ветроэлектростанций в республике продолжает расти, отражая стремление страны к увеличению доли возобновляемых источников энергии в общем энергетическом балансе. Согласно данным на середину 2024 года, в Казахстане действовало 59 ветровых электростанций общей мощностью около 1,4 ГВт.[22]. Кроме того, наличие таких регионов с высокоскоростными ветрами создаёт отличные условия для строительства ветропарков, которые могут значительно увеличить долю возобновляемых источников энергии в энергобалансе Казахстана.

Ветровая энергия является одним из наиболее перспективных направлений для страны, учитывая её обширные территории, где можно разместить большие ветропарки. Эти регионы не только обладают необходимыми природными условиями, но и могут способствовать созданию рабочих мест, привлечению инвестиций и улучшению инфраструктуры. Важно, чтобы государственная поддержка и международное сотрудничество способствовали развитию таких проектов, что позволит Казахстану стать одним из лидеров в области «зелёной» энергетики в Центральной Азии.

В настоящее время в Республике Казахстан имеется 90 действующих объектов возобновляемых источников энергии (ВИЭ) суммарной мощностью 1050,1 МВт (19 ВЭС–283,8 МВт; 31 СЭС–541,7 МВт; 37 ГЭС – 222,2 МВт; 3 БиоЭС – 2,42 МВт)[23].

Казахстан обладает значительным потенциалом для развития солнечной энергетики благодаря высокому уровню солнечного сияния. Среднегодовая продолжительность солнечного сияния составляет от 2000 до 3000 часов. На юге, например, в Кызылорде, этот показатель достигает 3042 часов.

Кроме ветряной существует и солнечная энергия. Так, согласно данным карты солнечного сияния, представленной на сайте Smart Pavlodar, средняя продолжительность солнечного сияния в Казахстане варьируется от 2000 до 3000 часов в год в зависимости от региона. Этот показатель служит важным индикатором для оценки потенциала солнечной энергии в различных частях страны. Особенно высокие значения наблюдаются на юге Казахстана, где солнечные панели могут эффективно работать большую часть года. (рисунок 2)

Помимо продолжительности солнечного сияния, процент дней без ветра также является важным фактором, влияющим на эффективность солнечных станций, поскольку он напрямую связан с возможностью использования солнечной энергии в периоды, когда ветер слаб. Южные и юго-восточные регионы Казахстана, такие как Кызылординская и Жамбылская области, обладают наибольшим потенциалом для использования солнечных электростанций, что подтверждается как картой солнечного сияния, так и практическим применением солнечных технологий в этих регионах.

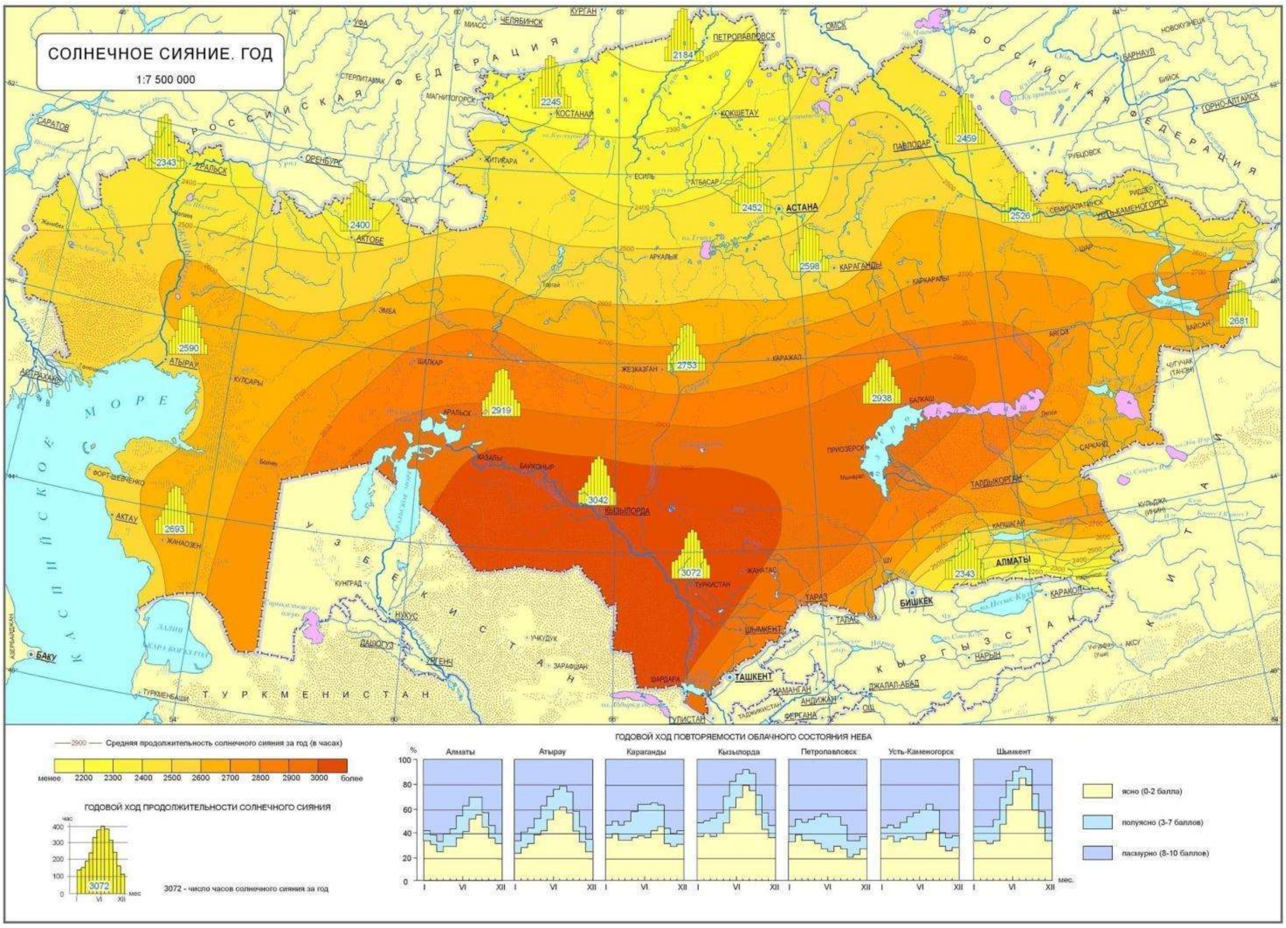

Рисунок 2 Карта солнечного сияния Казахстана

Эти данные помогают точно планировать размещение солнечных электростанций и оценивать их производственные возможности, что является важным аспектом для инвесторов, решающих, в какие проекты стоит вкладываться. В свою очередь зеленые облигации, являясь инструментом привлечения финансов для реализации экологически устойчивых проектов, играют ключевую роль в финансировании солнечной энергетики. Эти облигации обеспечивают доступ к более низким процентным ставкам по сравнению с традиционными кредитами, а также привлекают внимание международных инвесторов, что способствует увеличению объема инвестиций в ВИЭ. В Казахстане использование зеленых облигаций для финансирования солнечных проектов активно развивается, и такие облигации становятся важным инструментом в обеспечении финансовых потоков для строительства новых солнечных ЭС.

Проекты, такие как солнечные электростанции в Кызылорде и других южных регионах страны, уже получали финансирование через выпуск зеленых облигаций, что позволило обеспечить более выгодные условия для долгосрочных инвестиций. Также стоит отметить, что проекты, финансируемые через зеленые облигации, часто пользуются государственной поддержкой, включая налоговые каникулы и гарантии возврата инвестиций.

Влияние зеленых облигаций на развитие солнечной энергетики в Казахстане очевидно. Они способствуют сокращению стоимости капитала для солнечных проектов, улучшению инвестиционного климата и ускорению перехода страны к более экологически чистым и устойчивым источникам энергии. В условиях растущего спроса на чистую энергию и международных обязательств Казахстана по сокращению углеродных выбросов, использование зеленых облигаций будет продолжать играть важную роль в стимулировании роста солнечной энергетики.

На основе данных о солнечном сиянии и наличии потенциальных площадок для СЭС, Казахстан может существенно увеличить свою долю возобновляемых источников в энергобалансе, привлекая дополнительные инвестиции через выпуск зеленых облигаций и другие механизмы финансовой поддержки.

Зеленые облигации являются эффективным инструментом финансирования проектов в области возобновляемой энергетики. В Казахстане их использование способствует привлечению инвестиций, снижению стоимости финансирования и стимулированию развития сектора:

- ставки по зеленым кредитам обычно ниже рыночных, что делает проекты ВИЭ более привлекательными для инвесторов. Примером является финансирование ВЭС «Ерейментау» под 6,5% через облигации Азиатского банка развития (АБР).
- привлечение иностранных инвестиций, в Международном финансовом центре «Астана» (МФЦА) около 70% выпусков зеленых облигаций приобретаются международными фондами; ВЭС «Шокпар» (48 МВт) получила 60% инвестиций от Европейского банка реконструкции и развития (ЕБРР) через зеленые облигации.
- государственная поддержка - предоставление налоговых льгот, таких как 10-летние налоговые каникулы для проектов ВИЭ. Гарантии возврата инвестиций через программы «Даму» и др.

К основным проблемам внедрения возобновляемых источников энергии можно отнести финансовые барьеры, которые включают высокую стоимость строительства ВЭС/СЭС (1-2 млн $/МВт), долгий срок окупаемости (7-12 лет) и ограниченный доступ к дешевым зеленым облигациям для малого бизнеса. Технические ограничения связаны с изношенностью сетевой инфраструктуры (потери до 15%), нехваткой систем накопления энергии и зависимостью от импорта оборудования (80% компонентов). Регуляторные сложности заключаются в несовершенстве системы верификации зеленых проектов, бюрократических барьерах при подключении к сетям и отсутствии единого реестра зеленых облигаций. Рыночные риски включают низкую ликвидность вторичного рынка, риск “зеленого камуфляжа” и зависимость от иностранных инвесторов (70% капитала).

Но несмотря на эти трудности, у страны огромный потенциал. Так, Казахстан может стать региональным лидером в области ВИЭ, так как у нас больше 300 солнечных дней в году и степные районы с сильными ветрами.

Инвесторы проявляют всё больший интерес к зелёным облигациям, а это значит, что денег на новые проекты будет больше. По прогнозам, к 2030 году Казахстан сможет получать до 30% энергии из возобновляемых источников.

Государству необходимо ввести государственные гарантии по зеленым облигациям, упростить процедуру подключения к сетям (сроки ≤ 90 дней), разработать национальный стандарт зеленых облигаций и создать фонд софинансирования (30% стоимости проекта). Эмитентам рекомендуется развивать small-scale облигации (от 500 млн тенге), внедрять blockchain-реестр для отслеживания проектов и активнее использовать механизмы МФЦА (английское право). Инвесторам следует фокусироваться на hybrid-проектах (ветер+солнце+накопители), требовать внешний аудит экологичности и использовать валютные хеджирование для снижения рисков.

Таким образом, зелёные облигации – это реальный механизм привлечения инвестиции в проекты, которые делают мир чище.Мир движется к экологичной энергетике, и у Казахстана есть все шансы стать частью этого будущего. Вопрос только в том, насколько быстро страна сможет воспользоваться этим шансом.

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THE ROLE AND INFLUENCE OF DIGITAL TECHNOLOGIES ON MODERN MANAGEMENT

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Introduction

In the past few decades, digital technologies have revolutionized every aspect of social and economic life, including the way organizations are managed at all levels. The widespread adoption of these technologies has been accompanied by the rise of digital entrepreneurship, the emergence of a digital economy, the proliferation of online communication, and the shift towards a more sustainable approach to business.

In this context, traditional management models are being reevaluated, and strategic, tactical, and operational management strategies are being reimagined and updated.

This subject is particularly significant in the context of Industry 4.0, where digital transformation impacts crucial managerial processes: planning, monitoring, decision-making, personnel management, and customer engagement. According to recent studies, technologies such as artificial intelligence, business intelligence platforms, the Internet of Things, and cloud solutions offer organizations a competitive edge, enhance resource efficiency, and contribute to sustainable growth. However, digital transformation also poses certain challenges: increased energy consumption, the emergence of digital monopolies, the proliferation of electronic waste, and cybersecurity threats.

Therefore, the necessity to investigate the role and influence of digital technologies on contemporary management is not only due to their rapid advancement, but also to their multifaceted effect on management processes. The exploration of this subject will unveil both the benefits and obstacles of digital transformation, as well as pinpoint successful management approaches in the digital economy.

The objective of this research is to scrutinize the role and influence of digital technologies on the contemporary management framework, pinpoint significant trends in the digitalization of management processes, and assess their impact on management efficacy at the strategic, tactical, and operational levels.

Literature review

In today's world, the digital economy forms the basis for progressive economic growth, driven by the intensive use of intellectual capital in business structures and the transformation of intangible assets into a key factor in enhancing competitiveness in global markets for goods and services.

S. Bogachov research emphasizes that the digital economy brings about adjustments in the management systems of business organizations, driven by the significant impact of innovation processes[1].

B. Miethlich highlight the shift in focus in the progressive development of socio-economic systems towards creative companies, network intermediaries, client-oriented companies, and platform-based businesses and investment portfolio managers[2].

According to V.Iscaro, the digital transformation process has made organizational processes more intricate and unpredictable, necessitating managers to adopt novel approaches to decision-making in the face of uncertainty [3].

C. Aksoy highlights the increasing significance of digital platforms as new control hubs that shape an ecosystem of interaction between businesses, governments, and consumers, fostering sustainable development [4].

In essence, digital transformation is reshaping the way businesses operate, emphasizing intellectual capital and platform-based solutions. Modern management is increasingly reliant on an organization's capacity to adapt to digital challenges and leverage intangible assets as the foundation for sustainable growth.

Research methodology

The following methods were used in this study:

Content analysis of scientific and analytical literature

It is used to identify the main directions of management digitalization, classify the digital technologies used, as well as analyze their impact on various levels of management. This method allows us to summarize the theoretical and empirical data presented in modern sources.

System analysis

It is used for a comprehensive review of the impact of digital technologies on the elements of the control system. System analysis allows us to consider management as a set of interrelated components (strategic planning, operations, communications, resources, etc.), and assess how digitalization affects the structure, functions, and effectiveness of the entire management system. This approach is especially relevant in the context of the transition to a digital and "green" economy.

Results and discussion

In the past decade, digital technology has experienced a surge in popularity, thanks to its connections with digital entrepreneurship, the digital economy, digital social interaction, the green economy, and more. This has transformed the business landscape and, consequently, the strategic policies of organizations, thanks to the integration of blockchain technology.

This research aims to explore the advantages that have transformed daily life processes and procedures for various tasks, thanks to the convenience of digital technology. These advantages include transparency, centralization, and access to new markets for organizations, considering their implications, particularly when using digital technologies.

When processes occur online, there is a possibility to conceal knowledge about certain products or procedures to gain certain advantages.

Digital technologies have contributed to the transition towards a more sustainable economy by conserving resources and energy, reducing environmental impact, and promoting the use of eco-friendly technologies and reusable products[5].

The Internet of Things and the sharing economy are two specific instances of the influence of digital technologies on the shift towards a sustainable economy[6].

Digital technologies can contribute to the development of a sustainable economy in various ways: by minimizing the direct environmental impact of ICT production, distribution, operation, and disposal, by reducing the use of toxic materials and promoting proper waste management, by accelerating the production, distribution, and consumption of goods and services, and by reducing energy consumption and the need for resource-intensive products.

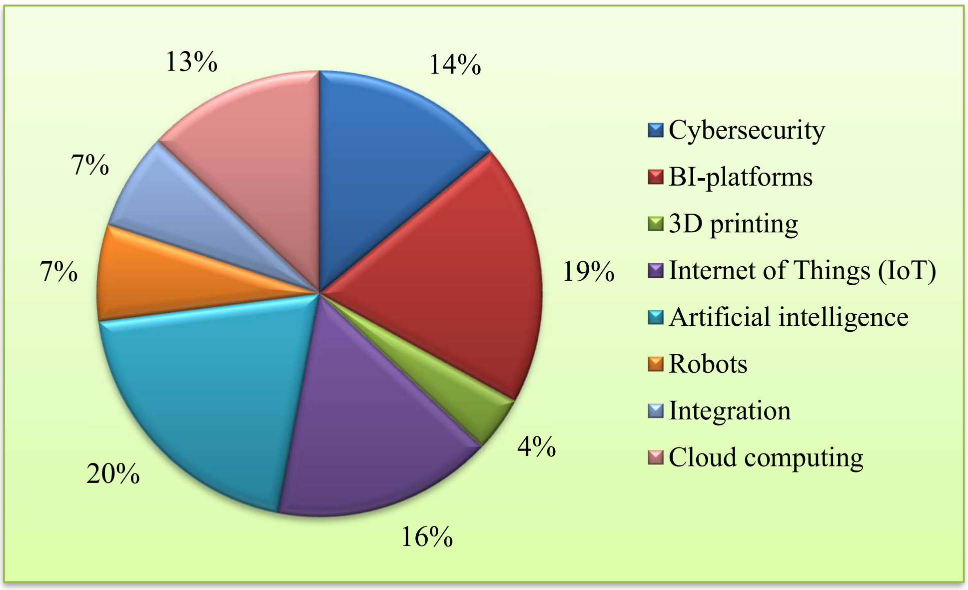
The growing market for smart devices and digital services is driving up energy consumption, greenhouse gas emissions, and the accumulation of electronic waste, which has adverse effects on the environment.. The practice of artificially inflating prices and employing monopolistic strategies to maximize quasi-rents, driven by pseudo-innovation, where marketing tactics that promote excessive consumption for status-seeking purposes replace genuine research and development, exacerbate these negative consequences.

The emergence of new technologies, the digital transformation of established processes and procedures, and the adoption of a sustainable economic approach have transformed the landscape of business opportunities. In recent years, the most frequently encountered terms in the academic discourse have been «digitalization», «information technology» and «sustainable economy».

To stay ahead in the market, a company must revamp its management strategy. Emerging technologies can assist in overcoming obstacles to development and achieving the goal of providing comprehensive management services to all. Digitally transformed and digitally empowered organizations offer a plethora of applications and digital resources that, combined, create novel and innovative capabilities that give companies a competitive edge[7]. The latest technological advancements are essential for modernizing corporate operations, such as administration, communication, and organization, to make them more sustainable.

Business representatives note that the Internet of Things, BI platforms and artificial intelligence are most significant when performing their professional tasks (Fig. 1).

Figure 1. The degree of impact of digital technologies on management tasks



The implementation of these tools prompted employees to adapt their traditional management practices, particularly the procedures for gathering and analyzing interim results. Industrial experts also highlight substantial cost savings achieved through the deployment of robots, 3D printing, and the reduction of manufacturing defects.

In the realm of heavy industry, professionals are contemplating the prospects for horizontal and vertical integration, formulating strategies and initiatives for transformation.

In the realm of marketing, public relations, banking, and retail, there is a shift in the way consumers are engaged, from taking orders to creating personalized products.

IT professionals, in their turn, emphasize the significance of cybersecurity tools, which are integrated into daily tasks and routine monitoring of customer operations.

The banking sector, in its own right, is actively engaged in cybersecurity matters and is poised to implement blockchain technology.

The strategic level of management is already functioning in a different approach and in the near future traditional models will become a thing of the past thanks to the active implementation of the Internet of Things, BI platforms and artificial intelligence.

In particular, they serve as a valuable instrument for efficient organizational planning. They enable automated personnel management, ensuring accurate and timely internal quality control of work and services. They facilitate the coordination and automatic adjustment of internal financial, investment, and personnel policies within enterprises. They enhance communication between management and employees, as well as between employees and suppliers, clients, contractors, subcontractors, and other entities. They enhance the effectiveness of marketing campaigns and events, enabling prompt communication with customers about promotions, discounts, working conditions, and the utilization of various digital advertising channels. They provide online training for staff using specialized software systems and online technologies. They enable independent online registration of clients, customers, and suppliers for appointments with company management and specific employees. They enable the creation of 3D visualizations of future projects. Create diverse designs, estimates, accounting records, financial reports, and other documents in an automated fashion.

Conduct automated analysis of extensive data sets, their storage, and security.

The significance of the integrated application of these technologies in enhancing service offerings and fostering business growth cannot be overstated.

Innovative IT solutions empower companies to enhance their market position and competitive edge, contributing to improved financial performance.

Managing the innovative development of business structures in the digital economy requires a comprehensive analysis of various factors and conditions that affect the facility. This includes assessing the potential for innovative projects, ensuring the availability of optimal information and methodological support that meet international standards and quality requirements.

When managing innovation activities, program-oriented resource approaches and the "goal tree" method are used. G.L. Bagiev emphasizes the importance of using economic and statistical methods, mathematical analysis, factor analysis, index analysis, and marketing.

The sequence of stages for a comprehensive analysis of an innovation development management system is presented in table 1.

Table 1 – The sequence of a comprehensive analysis of the management system for innovative development of business structures

Monitoring and comprehensive analysis of information on promising areas of activity of the business structure	
SWOT analysis of innovative potential	Assessing the sustainability of functioning according to socio-economic parameters
Situation modeling and scenario development innovative development	
Development of scenarios for implementing a business model for innovative development	Taking into account the risks of the external and internal environment
Optimization of the distribution of investment resources in priority areas of innovative development	
Expert assessment of business structure development scenarios	Development of a prediction for changes in performance indicators as a result of innovation activities

The level of innovative development is determined by an integral indicator of the potential of entrepreneurial structures. This indicator is formed by several blocks of a conceptual model.

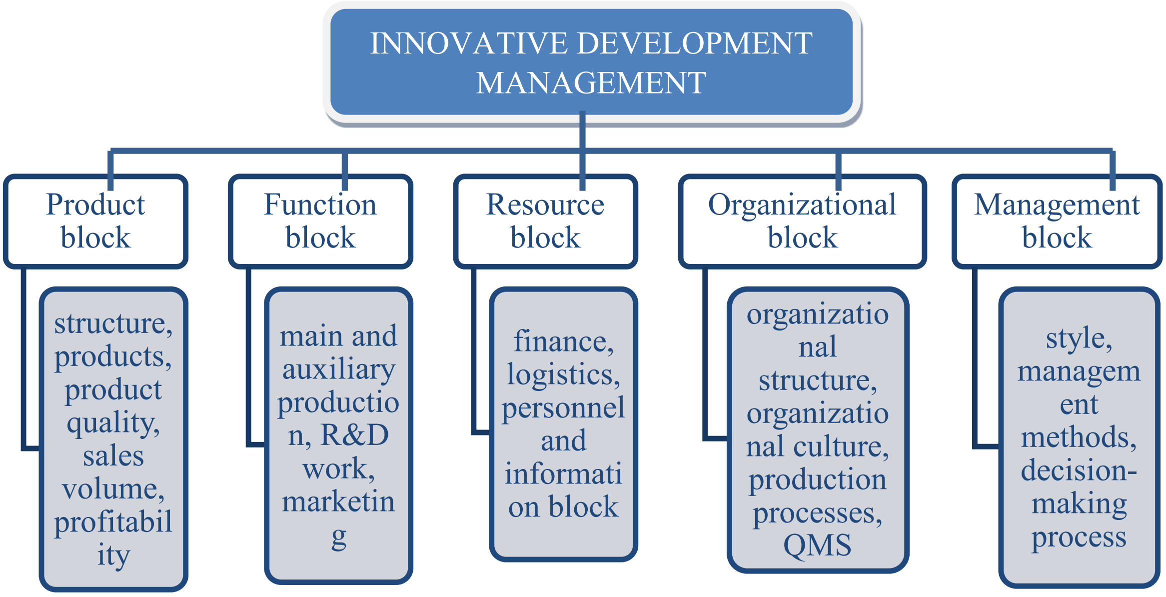
In the product production block, priority areas of activity are formed, such as the production of finished goods or the provision of services.

The functional block examines economic parameters related to research activities, development work, the production chain, and marketing research.

Resource block includes financial, material, and technical indicators as well as an assessment of human resources.

A conceptual model for managing innovative development in business structures is based on organizational and management blocks that are adjusted under the influence of trends in the digital economy(Fig. 2).

Figure 2. Blocks of the conceptual model for managing the innovative development of business entities. Compiled by the author



The digital economy necessitates the acceleration of innovative organizational transformations. Companies must implement and develop innovations in their management systems at least once every two to three years.

Studies have revealed that a third of innovative companies undergo organizational changes approximately every 4-5 years, while around 40% of business structures undergo reforms every 1-2 years. The remaining organizations undergo structural adjustments within a timeframe of 2-4 years.

The digital economy demands a more agile management approach and a faster pace of organizational changes within companies to enhance competitiveness and adapt to global market trends.

Interestingly, organizational changes related to reforming management forms and methods occur less frequently in 40% of large organizations compared to 27% of medium-sized companies and 13% of small companies.

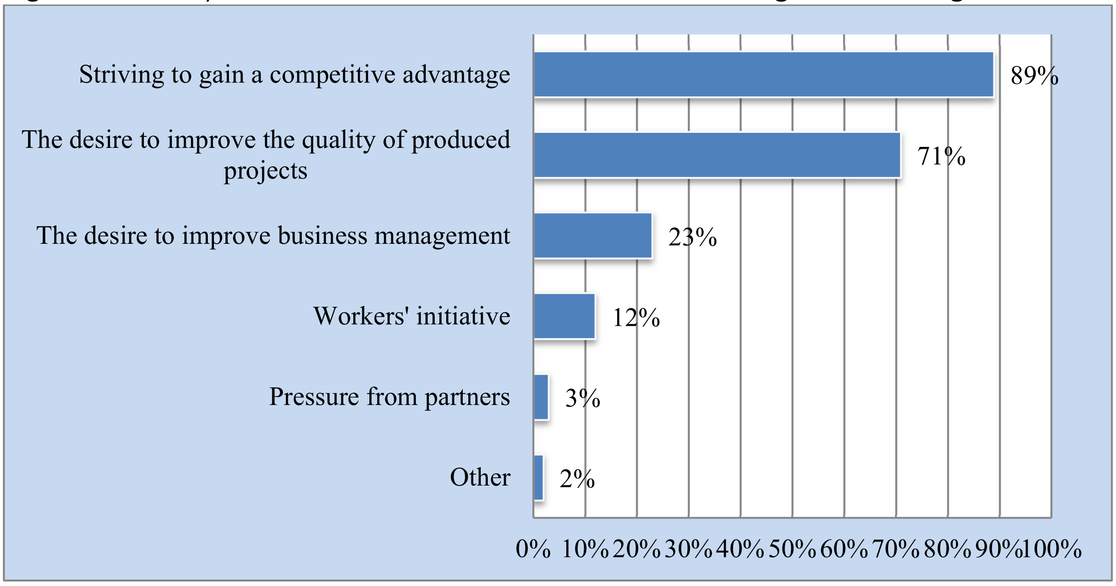
Digital technologies have had a profound impact on the quality management system within companies, with 65% of organizations reporting changes. Additionally, 48% of companies have implemented digital technologies in their project budgeting systems.

However, a significant number of businesses still lack a clear objective and strategy for implementing quality management principles.

At present, the proportion of companies that utilize digital technologies for centralized data storage and information visualization has increased substantially. This allows for swift adjustments to management decisions in real-time.

Management innovations, as depicted in Figure 3, are more prevalent in larger companies, with a three-fold increase. Business entities are actively leveraging digital technologies to enhance their competitive advantage (89%) and the quality of their products or services (71%).

Figure 3. Priority tasks of business structures in the use of digital technologies



The examination of the data reveals that almost all business entities prioritize the strategic management of their organizational knowledge, which is crucial for their long-term success. The custodians of this knowledge are the employees of the company, and it is embodied in various forms such as procedures, methodologies, patents, licenses, and the company's culture.

The enhancement of strategic management is not achieved through the use of conventional methods, such as outsourcing, reengineering, or benchmarking, but rather through the integration of IT systems into the management framework. The significant role of human resources is evident, as the improvement of human capital must be concurrent with the implementation of digital technologies. Otherwise, the potential for profit growth is diminished.. Such transformations are accompanied by a shift in bureaucratic administrative structures towards more professional ones, based on novel principles that ensure the attainment of strategic management objectives.

The innovative development of business entities, leveraging the advancements of the digital economy, is focused on gaining a competitive edge and enhancing the quality of products or services. The key factors for the sustained operation of companies in the digital economy include:

A well-balanced and adaptable organizational structure.

Established connections with regular clients and partners.

A stable financial standing and investment potential, providing the flexibility to make management decisions.

A pool of human and intellectual resources, ensuring a high level of expertise.

The ability to manage processes and diversify development areas.

In the field of business administration, government agencies have a crucial impact: they encourage groundbreaking research, regulate the legal use of digital technologies, establish and enforce quality standards for information services, safeguard economic stability, harness regional intellectual resources, and employ crowd-sourced tools, among other things.

Conclusion

The advent of digital technologies has fundamentally altered the landscape of contemporary business, profoundly influencing its strategic direction, operational processes, marketing strategies, customer engagement, and long-term sustainability. The integration of these technologies enhances transparency, adaptability, and operational efficiency, fostering new market prospects and bolstering the competitiveness of enterprises.

The process of digital transformation affects all aspects of organizational management, from operational to strategic. It encourages the adoption of innovative IT solutions, the development of human capital, and the restructuring of corporate structures.

In the digital age, organizations can only thrive if they adapt to the rapidly changing technological landscape, regularly update their management models, and integrate digital tools into their daily operations.

Moreover, sustainable growth in the digital environment requires companies to not only modernize their technology but also to rethink their corporate culture, investment strategies, and relationships with stakeholders. Strategic knowledge and human capital management are particularly important, as employees become the carriers of key competencies and the drivers of innovation. Only through a holistic approach — a fusion of digital tools, eco-friendly tactics, and a robust intellectual capital — can businesses guarantee their long-term viability, remain agile in the face of rapid transformations, and thrive in the global marketplace.

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THEORETICAL MODELS OF START-UP DEVELOPMENT

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Introduction

The rise of startups as a fundamental component of the contemporary economic landscape has sparked a sustained interest among scholars and practitioners worldwide. Over the past few decades, numerous theoretical frameworks have been developed to elucidate the essence and mechanisms of entrepreneurial activity. These frameworks encompass a broad spectrum of topics, from the cognitive processes of an entrepreneur to the transformation of business models, and their efficacy varies depending on the institutional and cultural backdrop.

Of particular significance is the examination of the applicability of these frameworks to the Chinese startup ecosystem, which is distinguished by its high level of digitalization, governmental influence, and unique socio-economic conditions.

The significance of this research lies in the necessity for a comprehensive understanding of how Western theoretical frameworks can be adapted to the unique circumstances of China. Despite the achievements of Chinese startups in various sectors, such as fintech and e-commerce, many of them encounter institutional obstacles, fierce competition, and fluctuating regulatory frameworks. This necessitates a more precise comprehension of which frameworks truly function in this context and which factors contribute to the success of startups in China.

The objective of this study is to conduct a comparative analysis of key theoretical frameworks for startup development and evaluate their relevance and applicability in the Chinese business environment.

Research objectives:

To examine the fundamental theoretical frameworks for startup development, including the Lean Startup methodology, the resource-based view (RBV), and the Business Model Canvas.

To identify the strengths and weaknesses of each framework when applied in the Chinese context.

The goal of this research is to explore the unique institutional and cultural factors that shape the adaptation of these models within the Chinese startup ecosystem. By examining the specifics of Chinese practice through the lens of existing frameworks, we aim to enhance our theoretical understanding of entrepreneurship in both global and localized contexts. This approach not only helps to clarify the limitations of these models but also contributes to the development of new, more adaptable and context-specific approaches to startup management.

Literature review

The study of theoretical models for startups is an active area of research in the academic literature, covering both Western approaches to entrepreneurship and locally adapted strategies that take into account the specific characteristics of individual countries. One of the most prominent foreign authors in this field is K.Olek, who has developed the Lean Startup methodology[1]. In his work, K.Olek views a startup not simply as a product but as a process of learning based on the "create-measure-learn" cycle. This approach enables entrepreneurs to quickly respond to market changes and minimize risks and uncertainties, especially during the early stages of a product's launch.

This paradigm is supported by the work of E. R. Freeman and D. S. Dmytriyev, a prominent theorist in the field of resource-based view (RBV) theory[2]. He emphasizes that a company's long-term success is determined by its ability to create and protect unique resources, such as knowledge, technology, organizational culture, and human capital.

This model has been widely applied in evaluating startups, particularly in high-tech industries where intellectual property and team expertise are crucial.

Chinese researcher X. Ren, G.Zeng, X. Sun's work, focuses on the institutional constraints and characteristics of the Chinese entrepreneurial environment[3]. They argues that, for Chinese startups, it is not just about having an innovative idea but also about being able to interact with government support, utilize guanxi (business connections), and take into account regulatory factors.

P.Sorokin, I.Froumin, S.Chernenko underscores the significance of adapting international best practices to the circumstances of the post-Soviet region, where institutional backing, a lack of venture capital investment culture, and the need for educational assistance for startup ventures are crucial[4]. Additionally, she emphasizes the role of university incubators and governmental incentives for the information technology sector.

Thus, the analysis of the literature allows us to identify three main theoretical approaches: Lean Startup, the resource-based view, and institutional models. These approaches require consideration of cultural, legal, and economic factors when applied in China and Kazakhstan, which forms the basis for a comparative analysis.

Research methodology

Within the framework of this study, a comparative analytical method has been used. This method aims to compare various theoretical models of startup development, such as Lean Startup, Resource-Based View (RBV), and Business Model Canvas. The purpose of this comparison is to identify common features, differences, strengths, and weaknesses among these models.

In addition to the comparative analysis, another method used in this research is the case study method. This involves examining specific examples of startups and their development paths to gain a deeper understanding of how different models can be applied in various contexts, such as technology startups, social initiatives, and educational endeavors.

Through the use of these methods, we aim to determine which model is most effective for different stages of a startup's lifecycle and which elements from these models can be adapted to different economic, cultural, and legal conditions. Additionally, we will explore the conditions under which each model is likely to be successful.

The case study method allows students to analyze real-life examples of startups that have put theoretical models into practice. This helps to connect theory with practice, identify patterns, and understand deviations.

The purpose of this method is to evaluate how different startups from different countries and industries have applied specific theoretical approaches. We can also see what results they achieved and how they adapted these models to their real-world conditions.

Some examples of how this method can be used in research include:

- Studying the cases of both successful and unsuccessful startups, such as Airbnb, Dropbox, and Spotify.

- Evaluating the effectiveness of the Lean Startup and Resource-Based View (RBV) models.

Results and discussions

In the framework of this study, in the process of comparing theoretical models (Lean Startup, RBV and Business Model Canvas), the following features were identified (table1):

Comparison Criterion	Lean Startup	RBV (Resource-Based View)	Business Model Canvas
Primary Focus	Rapid hypothesis testing	Internal resources and their uniqueness	Business model structure
Objective	Learning and adaptation	Sustainable competitive advantage	Systematization of the business idea
Flexibility	High	Medium	High
Applicability to Startups	Especially at early stages	When unique competencies are present	At all stages
Limitations	Ineffective without feedback	Difficulty in evaluating intangible assets	Risk of oversimplifying reality

This source was compiled based on the data [5-8]

This analysis shows that the Lean Startup model is the most versatile and dynamic in the early stages, while RBV and BMC are more suitable for subsequent business structuring and scaling.

The case study analysis focused on two internationally recognized startups, Airbnb and Dropbox, which have successfully applied key theoretical models of startup development in practice.

Airbnb

Model: Lean Startup + Business Model Canvas

History: Airbnb was founded in 2008 as a platform for private rentals.

Applying the model:

MVP: A simple platform for renting rooms during conferences.

User feedback: Reviews from first users highlighted convenience, safety, and lack of quality control.

Features: Ratings, photos, payment tools, on-site support were added gradually.

Business Model Canvas:

Customers: Tourists, hosts.

Value proposition: Accessibility, local experience.

Channels: Website, mobile app.

Revenue: Percentage of bookings.

Outcome: With an iterative approach, Airbnb quickly adapted to user needs and became a major player in the travel industry.

Dropbox

Model: Lean Startup + Resource-Based View (RBV)

History: Founded in 2007, Dropbox was a cloud-based file storage and sync service.

Applying Models:

Rather than a traditional MVP, Dropbox used a video demo to show how its service worked, avoiding the costs of development. This generated significant interest from early adopters.

Before launching the product, the company gathered valuable behavioral data.

With RBV, Dropbox relied on unique resources like synchronization, security, user experience (UX), and the team's expertise.

Over time, Dropbox increased its VRIN (valuable, rare, inimitable, non-substitutable) portfolio, including patents, infrastructure, and brand recognition. This gave it a long-term competitive advantage.

Results:

From a simple cloud storage service, Dropbox has grown into a feature-rich platform with millions of users worldwide.

The analysis revealed that theoretical frameworks for startup development are successfully implemented in both Western and global contexts. Key frameworks such as Lean Startup, the resource-based approach (RBV), and the Business Model Canvas (BMC) have demonstrated their effectiveness at various stages of the startup lifecycle.

The Lean Startup methodology has proven particularly effective in launching B2C products, where responsiveness to market feedback and scalability are crucial. By adopting an iterative approach and testing hypotheses, this methodology helps minimize risks and quickly adapt to the needs of the target audience.

On the other hand, the resource-based approach (RBV) proves effective when a startup possesses unique and difficult-to-replicate resources, such as technology, team expertise, patents, or strategic partnerships. This approach allows startups to build a long-term competitive advantage and strengthen their market position by leveraging their VRIN resources.

The Business Model Canvas has proven to be a valuable tool for strategic planning. It enables the organization to structure its business logic, visualize key elements, and identify areas for growth, particularly in times of high uncertainty and the need for adaptability to external conditions.

The success stories of Airbnb and Dropbox demonstrate that a combination of theoretical frameworks and an agile strategy can lead to scalable success. Airbnb effectively employed Lean Startup and the Business Model Canvas to rapidly bring its product to market and continuously improve it based on user feedback. Dropbox, in turn, combined Lean Startup with the Resource-Based View, leveraging its unique technological assets and strong engineering team to gain a sustainable competitive advantage. Both examples illustrate that the effective application of development frameworks, tailored to the specific product, market, and resources, is crucial for startup success.

Conclusion

The findings of this research indicate that the process of startup development is intricate and multifaceted, necessitating the utilization of flexible, resource-oriented, and strategically balanced approaches. The examined theoretical frameworks — Lean Startup, Resource-Based View (RBV), and Business Model Canvas (BMC) — demonstrate their practical applicability and provide entrepreneurs with effective tools to navigate the dynamic market landscape.

A comparative analysis of Airbnb and Dropbox exemplifies the effectiveness of startups that employ a combination of models tailored to their current objectives, resources, and developmental stages. The key success factors include the capacity for early-stage learning, the possession of unique resources, a systems-thinking approach, and a focus on the needs of the target audience.

Therefore, comprehending and skillfully implementing theoretical frameworks for startup growth not only minimizes risks but also fosters the creation of enduring competitive advantages. This makes them essential components of contemporary entrepreneurial instruments in both domestic and global innovation environments.

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DOMESTIC AND FOREIGN MODELS OF CORPORATE CULTURE OF AN ORGANIZATION AND METHODS FOR THEIR ASSESSMENT

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Introduction

The contemporary evolution of companies in the era of globalization, digital transformation, and heightened competition necessitates not only proficient administration and strategic foresight, but also a profound comprehension of the internal elements that underpin the resilience and triumph of a business. Among these elements, corporate culture stands out as a crucial factor, encompassing a collection of principles, standards, and conduct that influence the work environment and interactions within an organization.

The importance of this subject is due to the fact that the corporate culture directly influences the motivation of employees, their level of engagement, the quality of management, the company's image, and its ability to adapt to external changes.

A comparative analysis of corporate culture models in Kazakhstan, China, and Western countries is particularly intriguing, as these nations represent diverse cultural and historical backgrounds, managerial traditions, and approaches to fostering internal organizational collaboration.

In Kazakhstan, the integration of traditional values with new management practices is crucial, while in China, it is a fusion of Confucian philosophy with contemporary corporate strategies.

In contrast, foreign (primarily Western) models emphasize individualism, leadership, process transparency, and a focus on outcomes.

The aim of this research is to examine the domestic (Kazakh and Chinese) and foreign models of corporate culture within an organization, as well as to explore existing methods for assessing corporate culture in order to identify their characteristics, strengths, and limitations.

The novelty of this work lies in the fact that it is the first to conduct a comparative analysis of Kazakh and Chinese corporate culture models with international counterparts, focusing on the methods used for assessment. This approach allows for a deeper understanding of the unique aspects of organizational behavior in different cultural contexts.

The objectives of this research are:

To explore the theoretical foundations of the concept of corporate culture and its classification approaches;

To analyze the distinctive features of corporate culture formation and development in Kazakhstan and China;

To examine prominent international models of corporate culture (such as those proposed by Hofstede and Daniel Denison, among others).

To explore the current approaches to evaluating corporate culture and determine their suitability in various cultural contexts;

To perform a comparative examination of local and international frameworks for corporate culture.

Literature review

The exploration of corporate culture as a crucial aspect of organizational advancement is a subject of extensive investigation by both foreign and domestic scholars. Their research provides the theoretical and methodological framework for the analysis of corporate culture models and assessment techniques.

One of the most prominent researchers in this field is G. Hofstede, who developed a model of cultural dimensions that encompasses parameters such as power distance, individualism versus collectivism, and uncertainty avoidance[1]. This approach allows for the comparison of national and organizational cultures across different countries, including those with varying levels of development, such as Kazakhstan and China.

Daniel Denison proposed a framework for corporate culture, which encompasses four dimensions: participation, consistency, adaptability, and mission[2]. This framework has become a widely adopted tool for evaluating the cultural aspects of organizations, as it emphasizes the interplay between cultural characteristics and business performance.

In the Kazakh academic community, the study of corporate culture is approached through the lens of transformation and adaptation to global standards. In her research, A.Almasbekkyzy explores the unique aspects of organizational culture in Kazakh companies, highlighting the influence of traditional values, cultural mindset, and leadership approaches[3]. She argues that a successful corporate culture in Kazakhstan must be rooted in a fusion of ethnocultural elements and contemporary management practices.

I. V.Tian, F.Tang, B. C. A. Tse explores the Chinese perspective on corporate culture, emphasizing the significance of Confucian values, hierarchy, and harmony in organizational management[4]. They research underscores that Chinese companies are guided by the principles of teamwork, respect for authority, and long-term perspective, which sets them apart from Western models.

Therefore, a review of the literature reveals that scholars have developed a variety of perspectives on how to comprehend and assess corporate culture. Their work serves as a foundation for a comparative analysis of models that can be applied in Kazakhstan, China, and other nations.

Research methodology

The following methods were used in the research process:

Analysis and synthesis – to study the scientific literature on the issues of corporate culture, to identify key approaches and models.

Comparative analysis is used to compare Kazakhstani, Chinese and foreign models of corporate culture.

Results and discussion

In the course of the research, the main scientific methods of studying corporate culture were identified.

Special attention was paid to three key approaches:

1. Hofstede's cultural measurement model, which is based on comparing national cultures in several parameters, such as power distance, individualism, avoidance of uncertainty, and others.

2. D. Denison's model, which links corporate culture with organizational performance indicators.

3. The model of competitive values by K. Cameron and R. Quinn, which defines four types of cultures: clan, hierarchical, market and adhocratic.

The comparative analysis revealed differences in approaches to the formation and assessment of corporate culture in Kazakhstan, China and Western countries(table 1).

Table 1. Comparison of corporate culture models and methods of their assessment

Criteria	Kazakhstan	China	Western Countries (USA, Europe)
Cultural Characteristics	A mix of traditional and post-Soviet management. Respect for hierarchy.	Collectivism, Confucianism, vertical relationships, long-term orientation.	Individualism, result-orientation, flexibility, innovation.
Values in organizational culture	Loyalty, stability, respect for leadership.	Harmony, hierarchy, discipline, *guanxi* (personal relationships).	Freedom of action, goal achievement, teamwork, leadership.
Dominant type of culture	Hierarchical with elements of clan culture.	Hierarchical and clan-oriented.	Market-oriented and adhocracy (innovation-driven).
Influence on management style	Authoritarian-oriented, but with a tendency toward employee participation.	Centralized, based on respect for authority.	Delegation of authority, employee involvement in decision-making.

The source is compiled by the author based on the data [6-7]

The examination revealed that the corporate culture is closely intertwined with the national mindset, historical background, and societal norms. This connection is particularly evident in nations with deeply entrenched traditional philosophical frameworks, such as China, as well as in post-Soviet countries, including Kazakhstan. In such circumstances, corporate culture mirrors broader cultural and institutional values, encompassing perspectives on hierarchy, authority, and shared responsibility.

Western models of corporate culture, typically, are more universal and standardized, enabling the application of standardized and quantifiable assessment methods[8]. Models such as Hofstede's model of cultural dimensions, Denison's model of corporate culture, and Cameron and Quinn's model of competing values are widely employed in multinational corporations due to their structure and adaptability.

Meanwhile, in Kazakhstan and China, more flexible and context-specific approaches to evaluating corporate culture are becoming more prevalent. High-quality tools such as internal surveys, expert assessments, and monitoring are being used more frequently. To ensure cultural relevance, it is essential to adapt Western models, as their direct application without considering local nuances can lead to inaccurate results or ineffectiveness.

Furthermore, modern Kazakh and Chinese companies are increasingly incorporating elements of Western models of corporate culture, particularly in the context of international collaboration or when foreign capital is involved. However, these elements are integrated selectively, while maintaining the national characteristics of leadership styles, communication, and interactions with employees.

Therefore, the findings underscore the significance of cultural awareness and adaptability in evaluating and managing organizational culture across diverse national settings.

Conclusion

The research conducted has demonstrated that corporate culture is a multifaceted and intricate phenomenon, the development of which is deeply influenced by the national, historical, and social characteristics of a particular country.

A comparative analysis of domestic (Kazakh and Chinese) and foreign models of corporate culture has revealed significant disparities in management approaches, core values, dominant cultural types, and methods for assessing it.

In Kazakhstan, corporate culture is undergoing a transformation, blending post-Soviet traditions with elements of contemporary management practices. In China, it is largely rooted in Confucian values and principles of hierarchy, yet it also exhibits elements of adaptability in the context of globalization. Conversely, Western models are characterized by a high degree of formalization, an emphasis on individualism, achievement-orientedness, and open communication.

The methods employed to evaluate corporate culture differ across countries. In Kazakhstan and China, qualitative and adaptable approaches are frequently employed, whereas in Western practice, standardized quantitative instruments dominate. This underscores the importance of tailoring foreign methods to local contexts when they are implemented.

Therefore, the successful cultivation and management of corporate culture necessitates an awareness of cultural nuances, a flexible approach to assessment tools, and a deliberate equilibrium between local customs and global management trends. The outcomes obtained can serve as a foundation for further empirical research aimed at developing effective models of organizational culture in a transforming economy.

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ZƏHMƏT- RUZİ MMC-DƏ ƏMƏK EHTİYATLARINDAN İSTİFADƏNİN SƏMƏRƏLİLİYİNİN YÜKSƏLDİLMƏSİ İSTİQAMƏTLƏRİ

Dadaşova Zəhra Ruslan qızı
magistrant, Bakı Biznes Universiteti,Bakı şəhəri

Əmək-insanın maddi və mənəvi ehtiyaclarını ödəmək məqsədilə göstərdiyi məqsədyönlü fəaliyyətdir. Bu fəaliyyət zamanı insan zehni və fiziki gücünü sərf edərək məhsul və ya xidmət yaradır.Əmək istehsalatın əsas amillərindən biridir.

Əmək ehtiyatları — müəyyən bir ölkənin və ya regionun iqtisadiyyatında işləyə biləcək əhali hissəsini ifadə edən anlayışdır. Əmək ehtiyatları ölkənin istehsal potensialını müəyyən edən əsas resurslardan biridir.

Ətraflı desək, əmək ehtiyatlarına aid olanlar:

1.Əmək qabiliyyətli yaşda olan əhali:

Azərbaycanda bu yaş aralığı adətən kişilər üçün 15–64 yaş, qadınlar üçün isə 15–59 yaş hesab olunur.Bu qrup həm işləyənləri (məşğullar), həm də işsizləri əhatə edir.

2.İşləməyən, lakin işləyə biləcək şəxslər:

Təhsil alan, lakin işləməyə qadir olan tələbələr
Evdar qadınlar

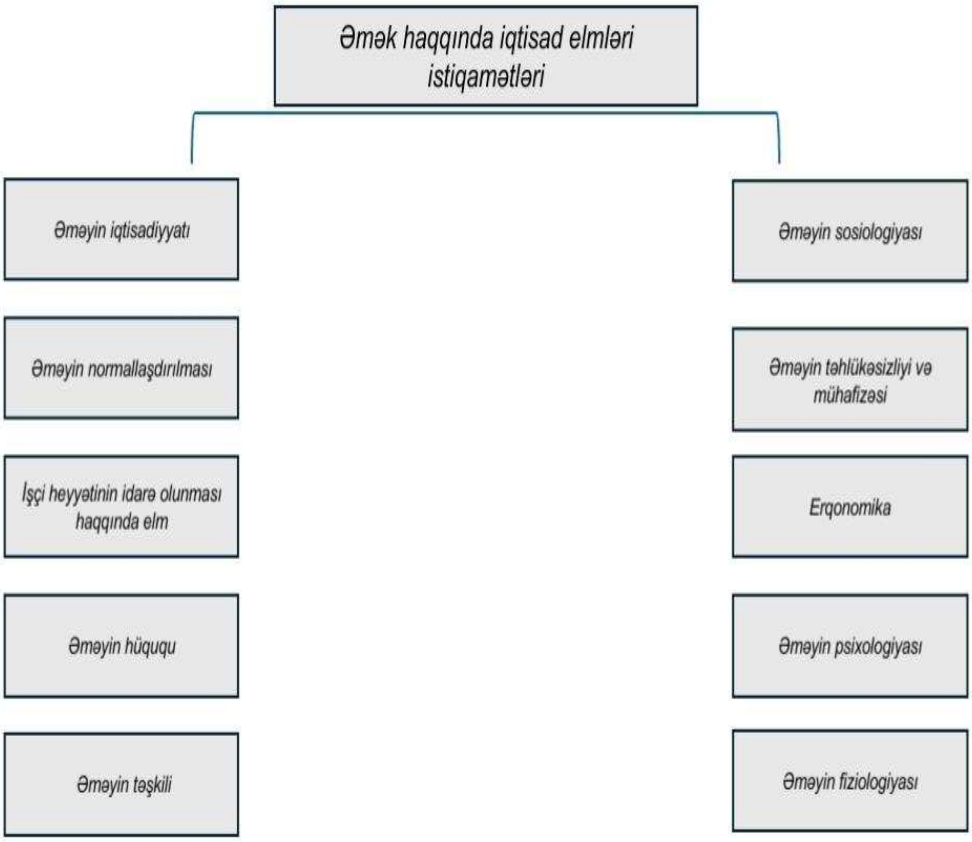
3.Əmək bazarından kənarda olanlar:

Əmək qabiliyyətli yaşda olub, işlə maraqlanmayanlar
Könüllü işləməyənlər və s.

Əmək ehtiyatlarının əsas xüsusiyyətləri:

Say və struktur baxımından dəyişkəndir-miqrasiya,demoqrafik dəyişikliklər, təhsil səviyyəsi və s. bu ehtiyatların miqdarına və keyfiyyətinə təsir edir.Bu göstəricilər insan kapitalının səviyyəsini göstərir və əmək bazarında rəqabət qabiliyyətini artırır.

Əmək haqqında iqtisad elmləri qrupunun istiqamətləri.



Mənbə:İnternet resusrları əsasında müəllif tərəfindən hazırlanmışdır.

Əməyin təşkili üzrə strateji yanaşmalarda işçilərin karyera inkişafı və fərdi potensiallarının reallaşmasına şərait yaradılması əsas məqsədlərdən biri olmalıdır. Bu isə hər bir əməkdaşın inkişaf etmək və özünü reallaşdırmaq imkanlarını qorumaqla mümkün olur.

Sosial-iqtisadi inkişafda insan resurslarının real və obyektiv qiymətləndirilməsi, fərdi bacarıq və intellektual potensialın tam ortaya çıxarılması üçün əlverişli şəraitin yaradılması olduqca vacibdir. Bu cür yanaşma yalnız fərdlərin deyil, ümumilikdə cəmiyyətin və iqtisadiyyatın balanslı inkişafını təmin edir. Sənaye müəssisələrində isə əmək potensialının idarə edilməsi müəssisənin strateji məqsədlərinə və əsas prioritetlərinə uyğun şəkildə həyata keçirilməlidir. İdarəetmə mexanizmlərinin çevik və tətbiqə yararlı olması əmək resurslarından maksimum dərəcədə faydalanmağı təmin edir [19.s 146].

Bununla yanaşı, müəssisədə əməyin təşkili və motivasiya sistemləri elə qurulmalıdır ki, işçilər üçün motivasiya aydın və perspektivli olsun. İşçilərin karyera yüksəlişi imkanları şəffaf və obyektiv meyarlarla müəyyən edilməli, onların vəzifə funksiyalarının yerinə yetirilməsi peşəkar və məsuliyyətli şəkildə təşkil olunmalıdır. İstehsalatda bütün proseslərin vaxt və məkan baxımından düzgün əlaqələndirilməsi vacibdir. Effektiv istehsal üçün əməliyyatların vaxt strukturunun planlaşdırılması, onların qarşılıqlı uyğunluğu və sinxronlaşdırılması əsas rol oynayır.Bu struktur çərçivəsində isə istehsal ardıcıl, paralel və ya paralel-ardıcıl formada təşkil edilə bilər. [17.s 116].

Mətnin əsas məğzi ondan ibarətdir ki, əmək ehtiyatlarının düzgün idarə olunması müəssisənin ümumi məhsuldarlığına və sosial-iqtisadi sabitliyinə birbaşa təsir göstərir.

Burada əsas fikirlər bunlardır:

- Resurslardan yüksək məhsuldarlıqla istifadə müəssisə üçün vacibdir.
- İdarəetmə mexanizmləri strateji, metodoloji baxımdan etibarlı və effektiv olmalıdır.
- Optimal idarəetmə işçi heyətinin potensialını artırır və müəssisənin inkişafına təkan verir.

- Sağlam iş mühiti və yüksək motivasiya isə əmək məhsuldarlığını və məmnunluğu gücləndirir[18.s 135].Bu məqsədə çatmaq üçün vəzifələr aşağıdakılardır:

1.Əmək resurslarından istifadənin iqtisadi göstəricilərinin qiymətləndirilməsi və təhlili;

2.“Zəhmət Ruzi” MMC-də əmək resurslarından istifadənin təhlili və səmərəliliyin artırılması yollarının müəyyən edilməsi .

İşçi heyətinin idarə olunması mikro və makroiqtisadiyyat, müəssisənin iqtisadiyyatı, statistika, istehsalın təşkili kimi iqtisad fənnləri ilə sıx bağlıdır.

İstehsal proseslərinin vaxt və məkan aspektlərindən təhlili;

- Əməliyyatların qarşılıqlı əlaqəsinin optimallaşdırılması;
- Proseslərin sinxronlaşdırılması və planlaşdırılması üsullarının tətbiqi;
- İstehsalın vaxt strukturunun effektiv idarə olunması üçün metodların işlənib hazırlanması;
- Əmək bazarındakı mövcud tendensiyaların və problemlərin müəyyən edilməsi;
- Dövlət siyasətinin və qanunvericiliyin əmək resurslarının idarə olunmasındakı rolu;
- Resursların səmərəli istifadəsini təmin edən mexanizmlərin inkişafı.

Elmi rasionallıq və hermenevtika anlayışları anlama və onun rasional idrakda rolu baxımından mühüm əhəmiyyət kəsb edir. Elmi rasionallıq, obyektivlik və empirik təcrübəyə əsaslanaraq biliklərin əldə olunmasını təmin edir. Hermenevtika isə mətnlərin və hadisələrin mənasının anlaşılması və təfsiri ilə məşğul olur. Bu iki yanaşma birlikdə insan idrakının daha dərindən başa düşülməsinə və elmi biliklərin daha effektiv şəkildə tətbiqinə imkan yaradır [20.s 80].

Aydındır ki, sahibkarlığın inkişafı üçün kapitalın yalnız pul şəklində olması zəruri deyildir. Qlobal təcrübə göstərir ki, bəzi istehsal sahələri sahibkarlıq fəaliyyəti baxımından yüksək gəlir gətirən sahələr kimi tanınır. Belə sahələrə yönəldilən investisiyalar tez bir zamanda maliyyə baxımından müsbət nəticə verir və sahibkara qazanc gətirir. Bu cür perspektivli sahələr aşağıdakılardır:

1) ictimai iaşə obyektləri;
2) ticarət sektoru;
3) avtomobil texniki xidmət və təmir sahələri;

Sahibkarın əsas vəzifələrindən biri də sərmayəni hansı sahəyə yönəltmək qərarını verdikdən sonra, həmin sahədə istehsal fəaliyyətini həyata keçirmək üçün lazımi resursları təmin etməkdir [25, s. 74]. Bu zaman torpaq resursları ya satınalma, ya da uzunmüddətli icarə yolu ilə əldə edilərək müvafiq istehsal infrastrukturu qurulur.

“Zəhmət Ruzi” MMC qeyri-dövlət müəssisəsi olaraq kənd təsərrüfatı və ərzaq məhsullarının istehsalı sahəsində fəaliyyət göstərir.

Müəssisənin istehsal etdiyi məhsullar AZS keyfiyyət idarəetmə standartlarına və ISO 9001:2000 sertifikatına malikdir. Müəssisədə ümumi idarəetmə strukturu əsasında əmək bölgüsü tətbiq olunur və işçilərin funksional vəzifələri dəqiq müəyyənləşdirilmişdir. Lakin, əməyin planlaşdırılması və monitorinqi sahəsində bəzi çatışmazlıqlar müşahidə olunur [27.s200].

Eyni zamanda, motivasiya alətlərinin zəifliyi və stimullaşdırıcı mexanizmlərin natamam olması əmək məhsuldarlığına mənfi təsir göstərir.

Marketinq və innovasiya sahələrində də əmək ehtiyatlarının rolu əhəmiyyətlidir. Lakin bu sahələrdə çalışan işçilərin fəaliyyəti sistemli şəkildə ölçülmür və nəticələr strateji qərarlara çevrilmir. Əlavə olaraq, müəssisədə işçilərin fərdi bacarıqları və peşəkarlıq səviyyələri nəzərə alınmalı, onların fəaliyyəti mütəmadi olaraq qiymətləndirilməlidir. Tədqiqat işində istifadə olunan məlumat bazası, Azərbaycan Respublikasının Əmək və Əhalinin Sosial Müdafiəsi Nazirliyinin təqdim etdiyi hesabatlar, Dövlət Statistika Komitəsinin illik statistik göstəriciləri və Dövlət Məşğulluq Xidmətinin analitik materialları kimi rəsmi mənbələri əhatə edir. Müəssisə daxilində işçi heyətinin idarə olunması formaları, tətbiq olunan metodlar və prosedurların öyrənilməsi, işçi heyətinin səmərəli fəaliyyətinin təmin olunmasına yönəldilmişdir. Bu prosesdə texniki fənlərlə qarşılıqlı əlaqə mühüm rol oynayır; belə ki, əmək proseslərinin təkmilləşdirilməsi, istehsal texnologiyasının və istifadə olunan əmək vasitələrinin təhlili ilə birbaşa bağlıdır. . Əməyin təşkili, funksiyaları və müəssisələrdə səmərəli istifadəsi məsələləri üzrə bir sıra tədqiqatçılar – L.A. Russel, C.B. Storey, C.M. Cennifer, M.F. Armstrong və digərləri – öz elmi əsərləri və yanaşmaları ilə diqqət çəkirlər.

Bu dövrdə, xüsusilə ABŞ-da F.U. Teylorun rəhbərliyi ilə aparılan tədqiqatlar, istehsal proseslərinin səmərəliliyinin artırılması məqsədilə əməyin elmi təşkili istiqamətində mühüm addımlar atılmışdır [28.s285].

Müəssisənin uğurlu fəaliyyəti üçün strateji və təşkilati yanaşmalar vacibdir. Əmək məhsuldarlığının artırılması məqsədilə müasir və qabaqcıl texnologiyaların istehsalat prosesinə tətbiqi əsas amillərdəndir. Eyni zamanda, işçi heyətinin peşəkarlıq səviyyəsinin artırılması və motivasiyanın gücləndirilməsi də məhsuldarlığın yüksəlməsində mühüm rol oynayır. Bu texnika və texnologiyalar əməyin avtomatlaşdırılmasına və iş səmərəliliyinin yüksəldilməsinə töhfə verir. Belə yanaşmalar müəssisənin fəaliyyətində operativlik və çevik qərarvermə prosesini gücləndirir.

Bundan başqa, müəssisənin maliyyə və təsərrüfat fəaliyyətini dəqiq şəkildə qiymətləndirməyə imkan verən göstəricilər sistemindən və planlaşdırma alətlərindən istifadə olunmalıdır.Əmək münasibətlərinə gəlincə, həm işçilər, həm də işəgötürənlər üçün əlverişli və ədalətli əmək şəraitinin yaradılması vacibdir. İş mühitinin sağlamlaşdırılması, sosial təminatlar və motivasiyaedici güzəştlər əmək resurslarının davamlılığını və effektivliyini artırır.Bu istiqamətlərdə ardıcıl və sistemli yanaşma müəssisənin strateji məqsədlərinə çatmasına xidmət edir.

Müstəqil Azərbaycanın hüquqi sistemində əmək münasibətlərinin tənzimlənməsi əsasən Əmək Məcəlləsi vasitəsilə həyata keçirilir. Məcəllənin hazırlanması zamanı Azərbaycan Respublikasının Konstitusiyasının müddəaları əsas götürülmüşdür. Əmək Məcəlləsinin tətbiqinə nəzarət və bu sahədə dövlət siyasətinin həyata keçirilməsi Əmək və Əhalinin Sosial Müdafiəsi Nazirliyi ilə Dövlət Əmək Müfəttişliyi Xidməti tərəfindən həyata keçirilir. Eyni zamanda vətəndaşların əmək, istirahət, sağlam və təhlükəsiz iş şəraitində çalışma hüquqları, insan hüquqları və azadlıqlarının müdafiəsinə dair əsas prinsiplər bu sənəddə öz əksini tapmışdır [29.s168].

Məcəllə 13 əsas bölmədən, 48 fəsildən və ümumilikdə 318 maddədən ibarətdir. Məcəlləyə əsasən:

1.İşçi dövlət sirri və kommersiya sirri kimi məxfi məlumatların qorunmasına ciddi əməl etməlidir.

Bu öhdəliklər əmək münasibətlərində etibarı və təhlükəsizliyi təmin edir.

2. Dövlət sirri və kommersiya sirri kimi məxfi informasiyaların qorunmasına əməl etməlidir;
3. Digər əməkdaşların hüquq və qanuni maraqlarını pozmamalıdır;
4. Məhkəmə qərarlarının və qətnamələrinin icrasına məsuliyyət daşıyır;
5. Əmək müqaviləsində göstərilən bütün şərtlərə və öhdəliklərə əməl olunması zəruridir.

Bu prinsiplər əmək münasibətlərinin hüquqi əsaslarını təşkil edir və hər iki tərəf üçün qarşılıqlı məsuliyyəti təmin edir [30,s.225].

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Роль кадрового потенциала в организациях школьного образования

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Аннотация. Статья посвящена стратегическому значению кадрового потенциала в системе общего и начального школьного образования. Автор рассматривает кадровый потенциал как совокупность профессиональных, личностных и адаптационных ресурсов всех категорий работников школы и подчёркивает, что именно грамотное управление этими ресурсами определяет устойчивость академических результатов, культуру инноваций и долгосрочную конкурентоспособность образовательной организации. На основе современных подходов к управлению персоналом показано, что потенциал коллектива раскрывается не линейно, а через создание поддерживающей экосистемы — эффективной административной коммуникации, распределённого лидерства и полноценного ресурсного обеспечения.

Ключевые слова: кадровый потенциал, системный подход, управление персоналом

В условиях стремительно меняющегося социально-экономического ландшафта качество общего образования во многом определяется тем, насколько эффективно образовательные организации способны мобилизовать, развивать и удерживать свой кадровый потенциал. Под кадровым потенциалом школы следует понимать совокупность профессиональных, личностных и адаптационных ресурсов всех категорий работников, прежде всего педагогов, но также административного, методического и технического персонала. Грамотное управление этими ресурсами позволяет не только повышать академические результаты обучающихся, но и формировать устойчивую культуру инноваций, обеспечивающую конкурентоспособность образовательной организации в долгосрочной перспективе.

Классические теории управления персоналом трактуют кадровый потенциал как латентную способность человеческих ресурсов к продуктивной деятельности, раскрывающуюся при наличии благоприятных организационных условий. В сфере школьного образования данное понятие приобретает ряд специфических черт:

Эмпирические исследования последних лет показывают устойчивую корреляцию между уровнем квалификации педагога и учебными достижениями учащихся. Однако прямолинейная связь «более опытный учитель → лучший результат» проявляется лишь при условии, что школе удаётся выстроить поддерживающую экосистему: эффективная административная коммуникация, гибкое расписание, распределённое лидерство и ресурсное обеспечение инноваций. Таким образом, кадровый потенциал выступает системообразующим фактором, а не простой суммой индивидуальных компетенций.

Особое внимание заслуживает феномен «кадрового резонанса»: когда ценностные и педагогические ориентации большинства сотрудников совпадают, возникает синергетический эффект, выражающийся в росте успеваемости, снижении текучести кадров и повышении родительской лояльности. Напротив, «кадровая диссонансность» (неравномерность квалификации, скрытые конфликты, бюрократический перегруз) снижает коллективную эффективность, даже если отдельные педагоги демонстрируют высокий профессионализм.

Кадровый потенциал является ключевым стратегическим ресурсом школы. Его продуктивное раскрытие требует системного подхода, сочетающего стратегический анализ, персонализированное развитие и институциональное стимулирование инноваций. При этом даже самые продвинутые модели управления персоналом теряют эффективность без культивирования доверительной образовательной среды, где ценится профессиональная автономия и поддерживается культура взаимного обучения.

С учётом вызовов XXI века — цифровой трансформации, глобальной конкуренции за таланты и усложнения социальных запросов — инвестирование в педагогический персонал должно рассматриваться не как издержки, а как долгосрочный капитал. Именно учитель, обладающий высоким уровнем профессиональной рефлексии и мотивации, способен не только передавать знания, но и формировать у школьников критическое мышление, гражданскую ответственность и гибкие метакомпетенции, необходимые для успеха в мире, который постоянно меняется.

Таким образом, роль кадрового потенциала в организациях школьного образования выходит далеко за рамки обеспечения «процесса обучения». Это фундамент, на котором строятся инновационность, устойчивость и общественный вклад современной школы.

Начальное школьное образование играет фундаментальную роль в формировании личности ребёнка, его мотивации к обучению и социальной адаптации. Именно в этот период закладываются базовые навыки — грамотность, логическое мышление, коммуникативные умения, а также первичные установки на труд, дисциплину и ответственность. Поэтому значение кадрового потенциала в учреждениях начального образования особенно велико и требует особого подхода.

Ключевые особенности кадровой работы в начальной школе:

1. Универсальность педагога

Учитель начальных классов — это педагог широкого профиля, совмещающий функции преподавателя, воспитателя, психолога и организатора. От него требуется не только владение методиками обучения по различным предметам, но и чуткость к эмоциональным и поведенческим реакциям младших школьников. Это требует особого уровня эмпатии и педагогической интуиции.

2. Формирование школьной мотивации

Первые годы школьной жизни определяют, станет ли ребёнок активным и заинтересованным участником образовательного процесса. Роль учителя здесь — не только передача знаний, но и создание среды, в которой каждый ребёнок чувствует себя принятым, успешным и нужным. Это требует от педагога высокой эмоциональной устойчивости, педагогического такта и способности гибко адаптировать методики.

3. Партнёрство с родителями

В начальной школе педагогу необходимо активно взаимодействовать с родителями, формируя единое воспитательное пространство. Учитель становится медиатором между семьёй и школой, координирует совместные усилия по развитию ребёнка. Это делает необходимыми коммуникативные компетенции и умение строить доверительный диалог с семьёй.

4. Повышенные требования к психологической подготовке

Возраст 6–10 лет является чувствительным к стрессу, социальной тревожности и неудачам. Учитель начальных классов должен владеть не только педагогическими, но и базовыми психологическими техниками: ранней диагностикой тревожности, агрессии, гиперактивности и других особенностей. Это требует непрерывного повышения квалификации и обмена практиками с психологами.

5. Развитие гибких методик и игровых форм

Начальное образование должно быть не только обучающим, но и развивающим. Элементы игры, проектной деятельности, межпредметных связей особенно важны. Поэтому кадровый потенциал в этой сфере предполагает наличие методической креативности, способности к постоянному обновлению содержания уроков с учётом индивидуальных особенностей учеников.

Кадровый потенциал в начальной школе — это не просто совокупность профессиональных навыков педагога. Это сложный комплекс личностных качеств, методической грамотности, эмоциональной зрелости и способности строить долгосрочные доверительные отношения с детьми и их родителями. Вложения в развитие учителей начальных классов — одна из самых эффективных стратегий обеспечения качества всего школьного образования, поскольку они формируют тот самый «стартовый капитал», с которым ребёнок входит в систему образования и общественной жизни.

Рисунок. Основные пути совершенствования кадрового потенциала

Схема охватывает три взаимодополняющих вектора: развитие, мотивация и сотрудничество. Это классическая модель, которая отвечает требованиям современного образовательного менеджмента. Высокая мотивация сотрудников напрямую влияет на их эффективность, вовлеченность и желание оставаться в системе образования. Мотивационные меры должны быть как индивидуальными, так и командными. Обмен опытом помогает внедрять передовые практики, избегать повторения ошибок и расширять профессиональный кругозор педагогов. Особенно важно для региональных и сельских школ, где внутренняя среда ограничена.

Роль ассортиментной политики в деятельности компании

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Аннотация. В статье рассматриваются теоретические аспекты формирования и реализации ассортиментной политики как ключевого элемента стратегического управления организацией. Особое внимание уделяется критериям классификации ассортимента, этапам его анализа и стратегического развития. Также в статье на примере дошкольных учреждений Республики Казахстан раскрываются особенности управления ассортиментом образовательных услуг. Показано, что современная система дошкольного образования ориентирована на гибкость, индивидуализацию и удовлетворение растущих потребностей семей. Эффективное сочетание образовательных, развивающих и вспомогательных услуг в ДОУ способствует формированию конкурентоспособных учреждений и качественной подготовки детей к школьному обучению.

Ключевые слова: ассортиментная политика, ассортимент услуг, анализ ассортимента

В современных условиях высокой конкуренции на рынке эффективное управление ассортиментной политикой становится ключевым фактором устойчивого развития предприятия. Ассортимент — это не просто совокупность предлагаемых товаров или услуг, но и важнейший инструмент позиционирования, удовлетворения потребностей целевого сегмента и формирования лояльности клиентов. Грамотно сформированная ассортиментная политика позволяет предприятию не только расширять рынок сбыта, но и оперативно адаптироваться к его изменениям, минимизируя риски и повышая рентабельность.

Ассортиментная политика предприятия — это совокупность стратегических и тактических решений, направленных на формирование, развитие и управление товарной номенклатурой с целью максимизации прибыли, удовлетворения потребностей потребителей и укрепления рыночных позиций.

В рамках этой политики определяется:

- широта и глубина ассортимента;
- жизненный цикл продукции;
- порядок обновления, модернизации и вывода продукции;
- сбалансированность между различными группами товаров по уровню рентабельности и спроса.

Эффективная ассортиментная политика должна учитывать как внешние (конъюнктура рынка, предпочтения потребителей, уровень конкуренции), так и внутренние факторы (производственные возможности, финансовые ресурсы, стратегия развития).

Ассортимент предприятия можно классифицировать по следующим критериям:

1. По широте:
    - узкий (ограниченное количество товарных групп);
    - широкий (многообразие товарных групп).
2. По глубине:
    - неглубокий (небольшое количество вариантов в пределах группы);
    - глубокий (широкий выбор внутри группы).
3. По стабильности:

- стабильный ассортимент (мало подвержен изменениям);
- динамичный (часто обновляется).

4. По уровню спроса:
    - основные товары;
    - сопутствующие товары;
    - сезонные и новинки.

Формирование ассортиментной политики должно опираться на следующие принципы:

- Адаптивность — способность быстро реагировать на изменения спроса и предпочтений потребителей.
- Рациональность — соответствие товарного портфеля производственным и финансовым возможностям предприятия.
- Инновационность — включение новых товаров, соответствующих современным требованиям и трендам.
- Рентабельность — приоритет товаров с высокой маржинальностью и потенциалом роста.
- Сегментация — учет особенностей различных целевых аудиторий и рынков.

Этапы разработки ассортиментной политики

1. Анализ текущего ассортимента (ABC/XYZ-анализ, матрица BCG, анализ жизненного цикла).
2. Оценка рыночной конъюнктуры (тенденции спроса, конкурентная среда, предпочтения потребителей).
3. Формирование стратегии развития (расширение, сокращение, обновление, дифференциация).
4. Внедрение и контроль (управление запасами, планирование продаж, мониторинг показателей).

Современные предприятия сталкиваются с рядом сложностей при реализации ассортиментной политики:

- перенасыщенность рынка и высокая конкуренция;
- быстро меняющиеся вкусы и поведение потребителей;
- технологическая сложность внедрения новых продуктов;
- логистические и производственные ограничения;
- риск неликвидных запасов и обесценивания продукции.

Преодоление этих вызовов требует гибкости, регулярного анализа и своевременного принятия решений на основе данных.

Ассортиментная политика — это неотъемлемая часть общей стратегии управления предприятием. Она оказывает прямое влияние на финансовые результаты, конкурентоспособность и устойчивость бизнеса. В условиях рынка, характеризующегося высокой степенью неопределённости, успех предприятия во многом зависит от способности грамотно формировать и оперативно адаптировать свой ассортимент, создавая ценность для клиента и извлекая максимальную прибыль из каждой товарной единицы. Поэтому регулярный пересмотр и оптимизация ассортиментной политики являются необходимым условием устойчивого развития любого предприятия.

Дошкольное образование в Республике Казахстан является первым уровнем системы непрерывного образования и рассматривается как важный этап становления личности ребёнка. В соответствии с Законом РК «Об образовании» и Государственным общеобязательным стандартом дошкольного воспитания и обучения, дошкольные организации предоставляют широкий спектр образовательных и сопутствующих услуг, направленных на интеллектуальное, эмоциональное и физическое развитие детей.

На фоне растущего запроса со стороны родителей, многие ДОУ в Казахстане предлагают:

- кружки и студии (музыка, танцы);
- языковые курсы;
- курсы по арифметике, логике;
- шахматы, робототехника, логопедия.

Эти услуги помогают дифференцировать образовательное предложение и адаптироваться к индивидуальным потребностям ребёнка.

Ассортимент услуг в дошкольных учреждениях Республики Казахстан представляет собой разноуровневую, гибкую и адаптивную систему, ориентированную на реализацию государственной политики в сфере образования, а также на удовлетворение разнообразных запросов семей. Эффективное управление данным ассортиментом позволяет формировать конкурентоспособные и современные детские сады, способные обеспечить высокий уровень подготовки детей к школе и жизни в быстро меняющемся обществе.

КОРПОРАТИВНАЯ КУЛЬТУРА КАК ФАКТОР УСТОЙЧИВОГО РАЗВИТИЯ ОРГАНИЗАЦИИ

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Аннотация. В условиях Казахстана корпоративная культура в значительной степени воспринимается через призму мероприятий, направленных на укрепление командного взаимодействия: тимбилдингов, корпоративных ивентов, формирования внутренних сообществ и иных инициатив. Однако корпоративная культура – это не только мероприятия, но и важнейший элемент стратегического управления персоналом. Она напрямую влияет на вовлечённость сотрудников, производительность, текучесть кадров и общую эффективность бизнеса, поскольку ключевым ресурсом любой компании является человеческий капитал. В настоящей статье анализируются современные теоретико-методологические подходы к изучению корпоративной культуры, а также представлена эмпирическая аналитика, включая данные исследований Gallup (2022–2024), подтверждающих критическую роль культуры признания и доверия, в снижении текучести кадров и повышении эффективности.

Ключевые слова: стратегическое управление персоналом, вовлечённость сотрудников, производительность, текучесть кадров, доверие в организации.

Введение

Современные трансформации, обусловленные постпандемийной реальностью, активной цифровизацией и экспоненциальным ростом удалённых форм занятости, существенно изменили характер трудовых отношений и механизмы управления персоналом. В этих условиях особую значимость приобретает корпоративная культура как неформальный регулятор поведения сотрудников и одновременно как стратегический ресурс обеспечения организационной устойчивости.

Корпоративная культура, представляющая собой совокупность ценностей, норм, убеждений и моделей поведения, разделяемых членами организации, становится важнейшим инструментом адаптации к внешним изменениям и внутренней консолидации коллектива. Её роль возрастает в условиях, когда традиционные управленческие рычаги теряют эффективность, особенно при распределённой или гибридной модели занятости, где прямая административная коммуникация и контроль становятся затруднительными.

Результаты исследования Gallup (2020) подчёркивают практическую значимость развитой корпоративной культуры: компании с высоким уровнем вовлечённости сотрудников и устойчивыми культурными практиками демонстрируют на 23% более высокую прибыльность и на 18% более высокую продуктивность по сравнению с организациями, не придающими системного значения этим аспектам [1]. Эти данные свидетельствуют о прямой корреляции между состоянием корпоративной культуры и ключевыми показателями эффективности бизнеса.

В современных организациях корпоративная культура всё чаще рассматривается как системообразующий фактор, способный не только объединять сотрудников вокруг общих ценностей и целей, но и формировать устойчивые модели поведения в условиях постоянных изменений. Она выполняет функцию внутреннего навигатора, помогая сотрудникам ориентироваться в сложной среде, принимать решения в условиях неопределённости и выстраивать эффективные коммуникации на всех уровнях. Благодаря своей интегративной роли культура способствует укреплению доверия, развитию ответственности и формированию среды, в которой поощряются инициативность, командная работа и стремление к постоянному развитию.

Таким образом, в контексте глобальных изменений и нарастающей конкуренции за человеческий капитал, исследование механизмов формирования и развития корпоративной культуры приобретает не только теоретическую, но и выраженную прикладную актуальность [2].

Основные компоненты корпоративной культуры

Для системного понимания и осознанного формирования корпоративной культуры необходимо выделить её ключевые структурные элементы, каждый из которых вносит вклад в общее восприятие, поведение и эффективность организации [2].

1. Ценности и поведенческие нормы

Ценности – это фундаментальные убеждения и ориентиры, определяющие, что является «правильным» и «приемлемым» в конкретной организационной среде. Они задают «моральный компас» компании и служат критерием принятия решений на всех уровнях [3]. Поведенческие нормы, в свою очередь, представляют собой конкретные формы реализации этих ценностей в повседневной деятельности сотрудников.

Сильные, чётко артикулированные и разделяемые большинством сотрудников ценности обеспечивают когерентность поведения, особенно в условиях неопределённости или изменений. По данным Denison Consulting, компании, обладающие высокой степенью согласованности ценностной базы, в 60% случаев успешнее достигают стратегических целей по сравнению с организациями с фрагментированной культурой. Это связано с тем, что ценности создают единый ментальный каркас, упрощающий координацию действий и повышающий внутреннюю мотивацию сотрудников [4; 5].

2. Лидерство и управленческие практики

Лидеры организации — ключевые носители и трансляторы корпоративной культуры. Их личные убеждения, стиль управления, коммуникативные привычки и поведенческие модели становятся своего рода «зеркалом» культуры, с которым сверяются сотрудники. Эффективное лидерство проявляется не только в способности достигать KPI, но и в умении укреплять ценности организации через личный пример, поддержку диалога, развитие команд и признание заслуг. Лидеры, демонстрирующие соответствие провозглашаемым ценностям, укрепляют доверие и стимулируют их органичную интеграцию в повседневную работу.

Культурное лидерство должно включать:

- регулярную обратную связь;
- участие в развитии командной идентичности;
- поддержку инициатив, отражающих ценности компании.

Противоречия между декларируемыми ценностями и реальным поведением руководителей разрушают культурный фундамент и способствуют формированию «теневой культуры» [4].

3. Коммуникационные практики

Качество и структура внутренних коммуникаций напрямую влияют на уровень доверия, согласованность действий и устойчивость корпоративной среды. Открытая, прозрачная и многоуровневая коммуникация способствует лучшему пониманию целей, снижает сопротивление изменениям и укрепляет горизонтальные связи. Согласно аналитике McKinsey, организации с развитой внутренней коммуникацией в 3,5 раза чаще превышают финансовые показатели среднего уровня [5]. Это объясняется тем, что качественная коммуникация способствует лучшему пониманию целей, снижает сопротивление изменениям и укрепляет горизонтальные связи между подразделениями.

Особенно важно, чтобы коммуникации включали не только формальные каналы, но и неформальные – внутренние сообщества, кросс-функциональные форумы, практики признания и обсуждения инициатив «снизу».

4. Ритуалы, символы и традиции

Этот компонент является важным механизмом эмоциональной и символической консолидации коллектива. Ритуалы и символы придают культуре «осязаемость»- они делают её зримой и узнаваемой, усиливая коллективную идентичность и формируя положительный эмоциональный фон.

Речь идёт как о символических элементах (логотип, слоган, архитектура офиса, фирменный стиль), так и о поведенческих практиках: регулярные встречи команды, церемонии признания, корпоративные праздники, ритуалы приветствия новых сотрудников (onboarding), ритуалы прощания и т. д.

Такие элементы не только укрепляют чувство принадлежности, но и служат проводниками ценностей – например, если признание успехов встроено в ритуалы, это усиливает ценность командной работы и инициативности. Традиции также играют роль в сохранении и передаче культурного кода между поколениями сотрудников, особенно в условиях высокого роста или текучести персонала. [4].

Эмпирические данные: кейсы Gallup (2022–2024)

Исследование Gallup & Workhuman (2023), охватившее 3 449 сотрудников, показало: сотрудники, получившие признание в 2022 году, на 45% реже увольнялись к 2024 году; высокая вовлечённость, связанная с позитивной культурой, увеличивает производительность на 23% и снижает абсентеизм на 81% [6]. Отсутствие доверительной культуры увеличивает текучесть в среднем на 32% в течение двух лет. По данным Gallup (2022), сотрудники, чьи ценности совпадают с корпоративными, в 4,5 раза чаще вовлечены [1].

“Recognition isn't a perk. It's a proven driver of retention and performance” (Gallup, 2023).

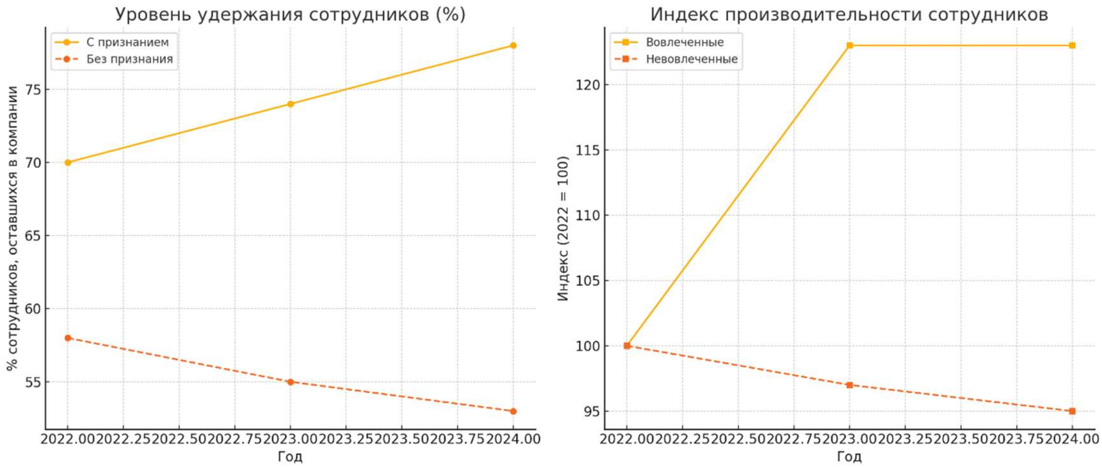

Рисунок 1. Связь между уровнем удержания и вовлеченностью сотрудников

Примечание: Составлено авторами на основании источника Gallup & Workhuman (2023). Empowering Workplace Culture Through Recognition [6].

Уровень удержания сотрудников- демонстрирует, что признание на рабочем месте стабильно связано с более высоким уровнем удержания.

Индекс производительности - показывает, как вовлечённость влияет на эффективность: вовлечённые сотрудники сохраняют и повышают продуктивность, тогда как невовлечённые теряют её.

Трансформация организационных практик в контексте корпоративной культуры: кейс компании Adobe

Одним из значимых примеров успешной трансформации организационных практик, направленных на повышение вовлечённости и удержание персонала, является кейс компании Adobe, реализованный в 2012 году. В рамках изменений компания отказалась от традиционного инструмента управления эффективностью – ежегодной оценки результатов деятельности сотрудников (Performance Review), заменив его на формат регулярных встреч Check-in. Такая реформа была обусловлена необходимостью формирования более гибкой, ориентированной на развитие организационной культуры, основанной на доверии и непрерывной обратной связи.

Концепция и особенности системы Check-in

Система Check-in представляет собой формат регулярных встреч между сотрудниками и их непосредственными руководителями, в ходе которых обсуждаются следующие ключевые аспекты:

- актуальные цели и приоритеты;
- индивидуальные траектории профессионального развития;
- обратная связь в двустороннем формате;
- признание достигнутых результатов.

Принципиальной особенностью новой практики стала отказ от формализованных шаблонов и стандартизированных оценочных шкал. Каждое взаимодействие адаптировалось под текущий контекст и индивидуальные особенности участников.

Ключевые элементы новой модели включают:

- переход к гибкому, индивидуализированному подходу;
- развитие управленческой компетенции в сфере конструктивной и некарательной обратной связи;
- институционализация признания как постоянной составляющей коммуникации;
- смещение акцента с оценки на развитие.

Эмпирические результаты трансформации

Через три года после внедрения системы Check-in были зафиксированы следующие количественные изменения:

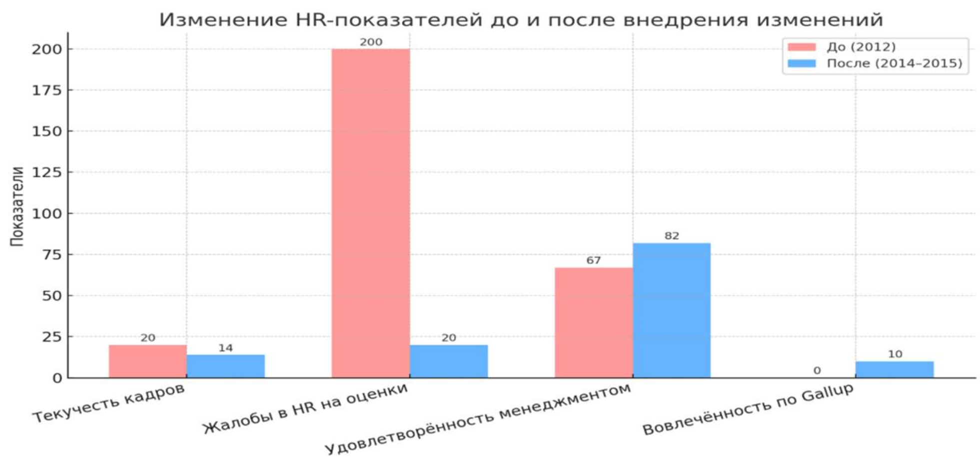

Рисунок 2. Изменение HR – показателей до и после внедрения изменений
Примечание: Составлено авторами на основании источника Harvard Business Review "Adobe Abolished the Annual Performance Review. Here’s What Happened" Авторы: David Rock, Beth Jones (2015) [7]

Данные результаты свидетельствуют о высокой эффективности внедрённой практики в контексте формирования среды, способствующей развитию человеческого капитала.

«Мы просто убрали оценку "наказать или похвалить" и дали людям пространство для роста и диалога. Это стало одной из самых мощных культурных трансформаций в Adobe»- Donna Morris, бывший Chief HR Officer компании Adobe [7].

Анализ факторов успешности внедрения

Системный эффект от внедрения практики Check-in объясняется несколькими ключевыми изменениями в организационной культуре:

- замещение культуры страха на культуру ответственности;
- переосмысление роли менеджера как коуча и наставника, а не оценщика;
- формирование доверительной атмосферы за счёт регулярных диалогов и устранения элементов формального контроля;
- снижение уровня неопределённости и тревожности за счёт предсказуемости и прозрачности взаимодействий.

Таким образом, кейс Adobe демонстрирует, что организационные практики, находящиеся в когерентности с корпоративными ценностями, способны оказывать трансформирующее воздействие на поведение сотрудников и общую эффективность человеческих ресурсов. Переход от формализованного контроля к поддерживающему лидерству и регулярному взаимодействию стал катализатором устойчивых позитивных изменений в системе управления персоналом. Институционализация обратной связи и признания в рамках повседневных процессов позволила не только повысить мотивацию, но и интегрировать культуру развития в повседневную деловую практику.

Заключение

Корпоративная культура в современных условиях – это не абстрактное философское понятие, а стратегически значимый и структурно оформленный элемент организационной системы, непосредственно влияющий на формирование человеческого капитала и, как следствие, на долгосрочную конкурентоспособность компании. Она определяет не только то, как сотрудники взаимодействуют между собой и с внешней средой, но и то, насколько организация способна адаптироваться к изменениям, удерживать таланты и поддерживать высокий уровень вовлечённости персонала.

Современная корпоративная культура должна обладать рядом ключевых характеристик: быть гибкой - способной оперативно отвечать на вызовы времени; ценностно-ориентированной- базироваться на разделяемых всеми уровнями организации принципах и убеждениях; опираться на доверие, признание заслуг и предоставление возможностей для профессионального и личностного роста. Такие параметры культуры не формируются спонтанно- они требуют целенаправленного и системного подхода.

Развитие корпоративной культуры возможно только при активном участии руководителей всех уровней, особенно топ-менеджмента, выступающего носителем и транслятором ключевых ценностей. Важнейшую роль также играет постоянная и многоуровневая обратная связь, позволяющая выявлять зоны развития и корректировать культурные практики в режиме реального времени. Необходима интеграция ценностных установок и культурных ориентиров в основные HR-практики - от найма и адаптации до оценки эффективности, мотивации и карьерного планирования.

Для практической реализации данных подходов целесообразно рассмотреть следующие решения:

1. Диагностика текущего состояния культуры: проведение регулярных опросов вовлечённости, ценностных ориентиров и организационного климата с последующим анализом и открытым обсуждением результатов.
2. Формирование культурного кодекса: разработка и внедрение документа, фиксирующего ключевые ценности, нормы поведения, ролевые модели и ожидаемые формы взаимодействия внутри коллектива.
3. Обучение и развитие лидеров культуры: запуск программ по развитию эмоционального интеллекта, лидерства, фасилитации и обратной связи для руководителей и амбассадоров культуры.
4. Внедрение ритуалов и символов: создание устойчивых практик, укрепляющих идентичностб (например, welcome-дни, корпоративные мероприятия, публичное признание успехов, традиции наставничествп и т.д.).
5. Интеграция культуры в HR-процессы: адаптация подходов к найму, оценке, удержанию и развитию сотрудников таким образом, чтобы они поддерживали и усиливали корпоративные ценности.
6. Создание digital-инструментов поддержки культуры: внутренняя социальная сеть, платформа для признания достижений, мобильные приложения для сбора обратной связи и управления мотивацией.

Таким образом, корпоративная культура должна рассматриваться как системный и управляемый процесс, а не как побочный продукт организационной жизни. При соответствующем внимании и ресурсной поддержке она может стать мощным фактором устойчивости и конкурентного преимущества в долгосрочной перспективе.

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Локальный «knowledge» куб для Knowledge management

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Аннотация. В статье приводятся результаты исследования по разработке системы управления знаниями на предприятии на основе концепции управления знаниями. Рассмотрены догадки по функциональной схеме в концепции системы. Предложена схема системы по аналогии с локальным OLAP (online analytical processing) кубом. Построен эвристический алгоритм обнаружения знании в данных. Приводится математическое описание алгоритма, основанного на методах логики первого порядка, продукционной модели представления знаний и методах обнаружение знаний в данных и интеллектуальном анализе. Опираясь на предыдущие исследования по разработке методов извлечения знаний из данных предложен комбинированный метод, который при обработке таблиц формирует базу знания. Машина вывода проверяет утверждение(гипотезу) в полученном запросе от источника запросов. Показана принципиальная возможность построение локального «Knowledge» куба, которая. опирается на модель трансформаций знаний Нонаки-Такеучи в концепции управления знаниями (Knowledge management).
Ключевые слова: Системы управления знаниями, обнаружение знаний в данных и интеллектуальном анализе, логическое исчисление, исчисления логики предикат, интеллектуальные системы.

Андатпа. Мақалада өнеркәсіпте біліммен басқару жүйесін құрумен байланысты зерттеулер нәтижелері қарастырылған. Жүйеге қойылатын талаптарды Knowledge management концепциясының негізінде құрасырылған. Зерттеу кезінде жасалған эвристикалық алгоритмнің математикалық сипаттамасы келтірілген. Алгоритм деректерден білімді шығару әдістері және білімді құру моделінің негізінде программалық жабдықтың әдісі қарастырылған. Алгоритм кетселерден білімді шығарып, білім қорын формальді жүйе ретінде жасайды. Ережелер интерпретаторы гипотезаларды тексеріп, қортынды шығарады. Алгоритм Python программалау тілінде жазылған. Мақалада локальді кубты құрудың концептілік негізі көрсетілген.
Түйін сөздер: Біліммен басқару жүйесі, Деректерде жіне интеллектуалды талдауда білімді анықтау, шығару, логикалық есептеулер, предикат логикасының есептеулері, интеллектуалды жүйелер.

Abstract. The article presents the results of a study on the development of a knowledge management system in an enterprise based on the concept of knowledge management. Considered guesses on the functional scheme in the concept of the system. A scheme of the system is proposed by analogy with a local OLAP cube. A heuristic algorithm for detecting knowledge in data is constructed. A heuristic algorithm for detecting knowledge in data is constructed. A mathematical description of the algorithm based on the methods of first-order logic, the production model of knowledge representation and methods of knowledge discovery in

data and intellectual analysis is given. Based on previous studies on the development of methods for extracting knowledge from data, a combined method is proposed that, when processing tables, forms a knowledge base. The inference engine checks the statement (hypothesis) in the received request from the request source. The algorithm is written in Python.
Keywords: Knowledge management systems, knowledge discovery in data and data mining, logical calculus, predicate logic calculus. intelligent systems.

1.Введение.

Одной из ключевых ролей в концепции управления знаниями (Knowledge management) на предприятиях занимает система управлениями знаниями. Существующие решения не нашли широкого применения, так как идеи концепции были еще не так востребованы и не полностью поняты современниками. На настоящий момент уровень научной идеи и технологий дают возможность пересматривать прошлые решения и в данной области. Перспективными могут стать междисциплинарные направления, то есть направления, в которых пересекаются различные подходы. Пересечением для концепции управления знаниями может стать интеллектуальный анализ. Становится интересным рассмотреть это пересечение, которая может выражаться в пределе обработкой полученных из данных выводов анализа. Другими словами, рассмотрим задачу, в которой необходимо построит информационную систему оперирующей не данными, а построенными над данными знаниями в рамках логического исчисления. При этом система не должна ограничиваться выводами анализа полученных над конкретными данными. Система как бы накапливая знания, в смысле термина искусственного интеллекта, использовать эти знания ссылаясь на них в производстве логических следствии или проверки утверждения. Упоминания о важности построение подобных систем и их применении на практике можно найти в концепции управления знаниями (Knowledge management). Рассмотрим принципы построение данной системы подробнее.

2. Литературный обзор.

В 80-90-х годах XX века американские, японские и западно-европейские экономисты: М. Алави, Н. Бонтис, У. Букович, К. Вииг, Т. Дэвенпорт, И. Нонака, Г. Пробст, Й. Руус, К.-Э. Свейби, Х. Такеучи, Д. Тис, Л. Эдвинссон, заложили концептуальные основы управления знаниями. Сейчас эта концепция считается одной из инновационных подходов управления предприятием. В публикациях в этой области доказывается, что управление на основе принципов данной концепции приводит к развитию предприятия. В концепции также упоминается применение, для некоторых процессов, системы управления знаниями. Это информационная система. В частности, в работах Нонака и Такеучи или Давенпорта [1, 2] упоминается аналогичная информационная система. О системе управления знаниями говорится и в других источниках. Существуют попытки построение такой системы, например, в публикациях тех лет, идет речь об архитектуре этой системе (Том Шорт, старший консультант по управлению знаниями в IBM Global Services). Следует отметить, что существую и научные работы, например как работа [3]. Однако, как показывает практика, предложенные решения не получили широкого применения. В настоящее время, с ростом интереса к совершенствованию аналитической деятельности предприятия, с одной стороны, и развитием научных идей и технологий в области построение информационных систем, с другой стороны, вопрос по разработке систем управления знаниями снова может найти свою актуальность. Следует также рассмотреть такую систему, как инструмент интеллектуального анализа данных предприятия. Которая могла бы дополнять или проверять выводы анализа или визуализаций данных.

Зададимся вопросом о построении системы управления знаниями, которая, согласно той же концепции управления знаниями может обнаружит «потенциально явные знания», преобразовывать их в «явные». В данной статье сосредоточим свое внимание на рассмотрении подхода по реализации такой системы. Обзор литературы показывает, что

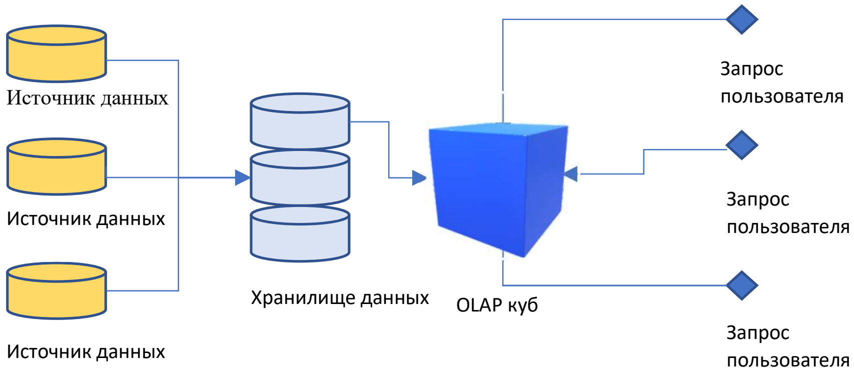
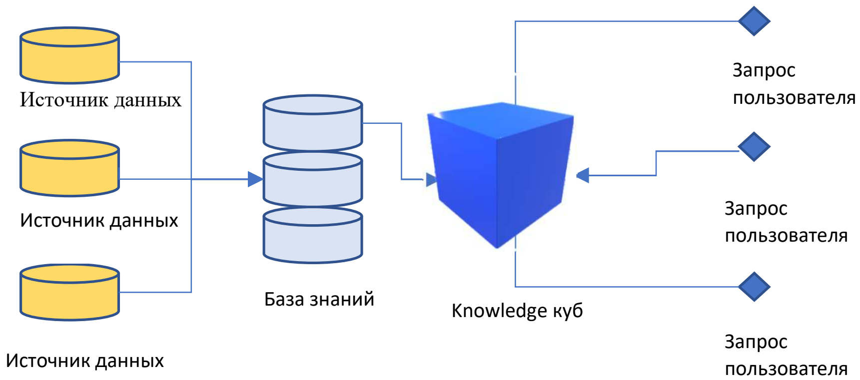


Рисунок 1. Функциональная схема OLAP системы. [4]

при разработке подобных систем, задача обнаружения, обогащение базы «явных» знаний является основной задачей для систем управления знаниями. Речь идет об обеспечении процесса «комбинации явных знаний» в модели Нонака и Такеучи. Рассуждая на основе имеющегося обзора при проектировании функциональной схемы системы управления знаниями, можно заметить, что систему можно реализовать как экспертную систему. Которая отличается от классической системы тем, что база знаний может обогащаться продукцией извлеченных из данных. Непосредственно из источников данных. На стороне взаимодействие с клиентом система введет себя как классическая экспертная система,



отвечая на запрос. Наиболее удобной в такой интерпретации функциональная схема может

Рисунок 2. Функциональная схема системы управления знаниями.

быть схема локального OLAP куба. Как показано на рисунке 1. Следуя догадке, функциональная схема системы может быть представлена по аналогии с локальным OLAP кубом. Как показано на рисунке 2.

Как показано на рисунке, в рассматриваемой функциональной схеме, ключевую роль занимает «Knowledge куб», которая по предположению согласуется с моделью Нонака и Такеучи [5] «комбинации явных знаний», должна порождать новые знания, утверждения полученных на основе существующих высказываний или данных полученных из других источников, например внешней базы данных.

3. Методы.

Решения по построению системы управления знаниями мы сводим к построению интеллектуальной системы. При этом мы опираемся на работы в области применение методов обнаружения знаний в данных (Knowledge Discovery in Data Bases and Data Mining) и интеллектуальном анализе. В частности опираемся на работы [6, 7]. В которых построены эвристические системы с применением технологий обнаружения знаний в данных. Однако в таких работах извлечение знаний из таблиц основываются на определённом шаблоне формул предикат или логической формуле, которая требует конкретный тип структуры таблицы. Другими словами, метод проверяет строки таблицы с приведенной заранее известной формы гипотезы (логической формуле), с помощью которой извлекают строки из таблиц соответствующей этой логической формуле. В данной работе рассматривается комбинированный подход, который заключается в построении логических формул, утверждений на базе различных срезов таблицы. Сама интеллектуальная система выполняет роль формальной системы, которая состоит из множества аксиом и множества правил вывода. Становиться очевидным, что элемент локального Knowledge куба — это тоже формальная система, которая обладает собственным множеством аксиом и правилами вывода.

Представим локальный «Knowledge» куб как формальную систему в логике первого порядка, на базе срезов таблиц. В функциональной схеме таблицы являются источниками базы знания, которая в нашем случае представляется множеством аксиом. Покажем общий подход извлечения утверждения из таблиц на основе срезов. Достаточно представить срезами формулы исчисления предикатов.

Пусть задана таблица $table(p_1, p_2, \dots, p_n)$, где p_i есть атрибут сущности таблицы. Тогда представляя каждый атрибут предикатной в логике, мы можем построит множество аксиом формальной системы или базу знаний в функциональной схеме, предложенной выше:

$$\forall x P(x) \sim \{[table[table[p] * a],\ len(table[table[p] * a]) \approx len(table)\} \quad (1)$$

$$\exists x P(x) \sim \{[table[table[p] * a],\ len(table[table[p] * a])\ != 0\} \quad (2)$$

$$P(x) \& Q(y) \sim \{[table[(table[p] * a) \& (table[q] * b)]\} \quad (3)$$

$$P(x) | Q(y) \sim \{[table[(table[p] * a) | (table[q] * b)]\} \quad (4)$$

$$\forall x \neg P(x) \sim \{[table[(table[p] * a)], sum(table[p] * a) \approx len(table)\} \quad (5)$$

$$\exists x \neg P(x) \sim \{[table[(table[p] * a)], sum(table[p] * a)! = 0\} \quad (6)$$

$$\neg \forall x P(x) \sim \{[table[(table[p]! = a)], sum(table[p]! = a)! = 0\} \quad (7)$$

$$P(x) \to Q(y) = \neg P(x) | Q(y) \quad (8)$$

$$\forall x P(x) \to P(y), P(y) \to \exists x P(x) \quad (9)$$

Формула (8) следует из формул (4), (5) и (6). Следует отметить, что в формулах (1)—(9), символ a, b — агрегатные функции, $*$ — логическое выражение. В формулах (1)—(9)

используются коды на языке python команды модуля pandas. x, y — экземпляры сущности таблицы.

Формулы (1)—(9) являются также основой для построения арифметики формальной системы по К. Геделю, которые дают возможность перейти на уровень языка дедуктивной логики и строит логические выводы на основе интерпретатора правил. Здесь в основе интерпретатора лежит метод продукции и некоторые правила по типу *modus ponens*.

Приведем несколько примеров формул множества правил вывода.

$$\frac{\forall x P(x) \rightarrow \forall y Q(y), \forall x P(x)}{\forall y Q(y)}, \frac{\forall x P(x) \rightarrow \exists y Q(y), \forall x P(x)}{\exists y Q(y)} \quad (10)$$

$$\frac{F \rightarrow \exists x P(x)}{F \rightarrow \forall x P(x)}, \frac{\forall x P(x) \rightarrow F}{\exists x P(x) \rightarrow F} \quad (11)$$

Формула (11) представляет правила обобщения и конкретизации. Формула (10) и другие правила реализуются на основе модели продукции. Приведем пример, сопоставления и срабатывания правила (10).

$$If\ len(table[(table[p] * a)\&(table[q] * b)]) > 0 : print('\exists y Q(y)') \quad (12)$$

4. Результаты.

В результате рассмотрения задачи построения системы управления знаниями нам удалось построит алгоритм интеллектуальной системы, которая может разрешит задачи предусмотренных в концепции управления знаниями предприятия. А именно, в части «комбинации явных знаний». При этом удалось предложить самостоятельную систему, которая может применяться в аналитической деятельности предприятия. Продуктом такой системы являются утверждения, сделанные на основе обработки таблиц и обнаружения в них знаний. Эти утверждения могут корректировать или дополнять выводы анализа, например сделанных на основе интеллектуального анализа и визуализации данных. В результате исследования нам удалось построит алгоритм получения знаний из таблиц и построение логических выводов по запросам в полной мере советующей функциональной схеме. Фрагмент алгоритма, реализующий один отчет локального куба, приводится в качестве примера на рисунке 3 а)—б). Здесь показаны примеры реализации формул (1)—(9), на основе языка Python применив модули Pandas и Prolog.

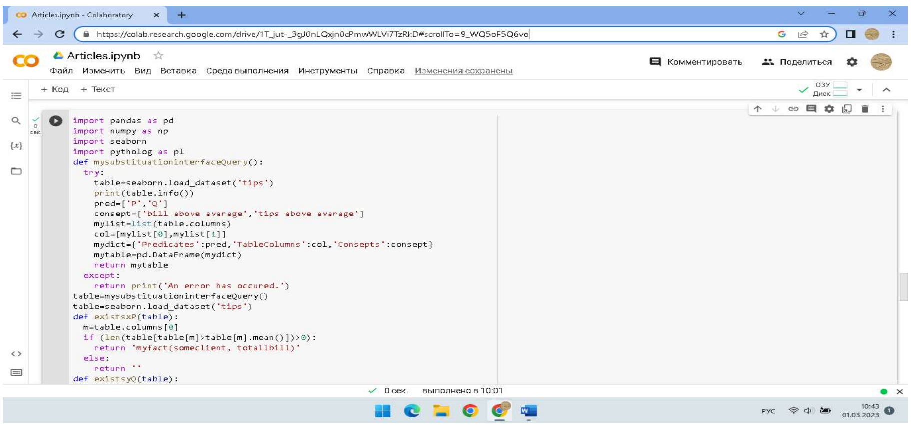


Рисунок 3. Фрагмент работы алгоритма локального куба, а)

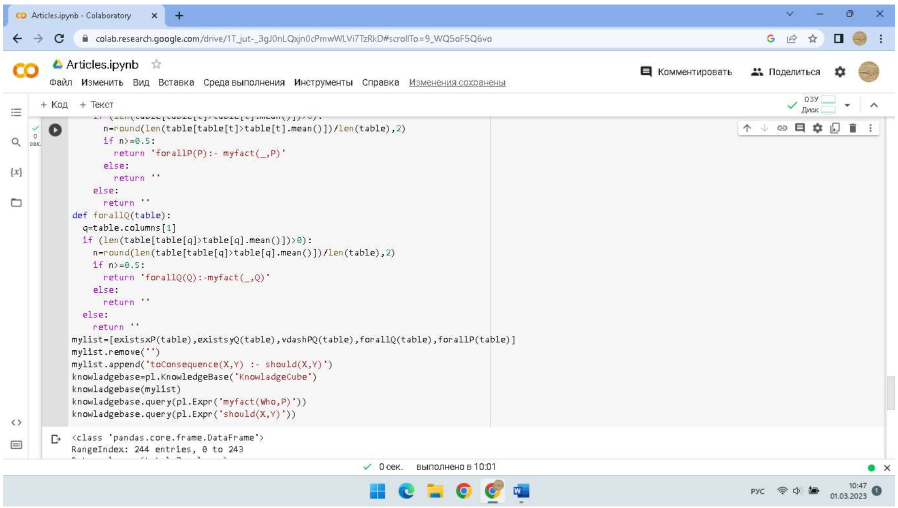


Рисунок 3. Фрагмент работы алгоритма локального куба, б)

5. Выводы и обсуждение.

На рассмотренном этапе практическое применение «Knowledge» куба ограничена логикой первого порядка. Существует необходимость расширить модель представления знаний системы, применив методы нечеткой логики, а также возможно индуктивной логики. Следует также отметить о необходимости графического интерфейса. Алгоритм имеет возможность интегрировать в обработку запроса методы обработки естественного языка. Результаты исследования могут быть представлены как альтернативный источник выводов анализа данных. В основе которой лежит логическое исчисление. Полученные результаты исследования подтвердили начальные предположения о том, что предложенная архитектура системы управления знаниями разрешает ряд задач, которые были предусмотрены концепцией управления знаниями. Прототип также имеет потенциал применения в аналитической деятельности предприятия.

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Intelligent Neural Network System for Analysis and Optimization of Production Processes Based on a Digital Twin: Comparative Analysis and Strategic Positioning in the Context of Industry 4.0 and 5.0

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Annotation. This article is an in-depth analysis of an innovative Intelligent Neural Network System designed to analyze and optimize production processes at food processing enterprises. The essence of the system lies in its ability to revolutionize operational efficiency by automatically analyzing employee movements, identifying deviations from optimized plans, predicting potential delays and dynamically adjusting schedules and tasks in the real-time, which is critically important in the context of daily changes in orders and technological maps.

The main value of the system is a significant increase in productivity and responsiveness for small and medium-sized enterprises (SMEs) in the food sector, which is often characterized by high volatility and complexity. Technologically, the system demonstrates a high degree of sophistication, using advanced artificial intelligence (AI) models, including spatio-temporal graph convolutional networks (GNNs) for detailed motion analysis, recurrent neural networks for robust predictive analysis, and deep reinforcement learning (DRL) for dynamic real-time optimization and resource reallocation.

Strategically, the system demonstrates a strong alignment with the fundamental principles of Industry 4.0, especially in the use of cyber-physical systems and real-time data. Moreover, its emphasis on optimizing human labor through movement analysis and task redistribution positions it as an innovative solution within the evolving human-centered paradigm of Industry 5.0. The system's proactive, adaptive capabilities and robust architecture for integrating different data streams are key benefits that enable SMEs to successfully navigate volatile market demand and achieve sustainable growth.

1. Introduction

1.1. Definition and evolution of Digital Twin technology

A digital twin (DDI) is defined as a dynamic, virtual copy of a physical object, system, or process that functions in real time.[6] This digital replica uses sensor data and advanced analytical techniques to accurately reproduce the current state and behavior of a physical object in a digital environment. Its primary function is to provide in-depth insights, predict future outcomes, and facilitate informed decision-making.[6]

The concept of the Digital Twin was first introduced by Greaves around 2002 in the context of Product Lifecycle Management (PLM) and subsequently became widespread after its adoption by NASA to develop high-fidelity simulations and testing in the aerospace industry.[9] Over the years, CD technology has evolved significantly, from static simulation models that are based on historical data and predefined scenarios, to dynamic, constantly updated replicas that reflect the living state of their physical counterparts.[6] This development represents a fundamental shift in the approach to industrial modeling and optimization. Unlike traditional simulations, which provide only a snapshot or a limited set of hypothetical outcomes, Digital Twins offer a living, ever-evolving view of reality that allows for unprecedented levels of accuracy, responsiveness, and continuous optimization.

1.2. The Synergistic Role of Artificial Intelligence (AI) and Machine Learning (ML) in Empowering Digital Twins

Artificial intelligence (AI) and machine learning (ML) algorithms are fundamental technologies that determine the effectiveness of Digital Twins.[6] These algorithms play a critical role in analyzing the vast amounts of data generated by the DDC, identifying complex patterns, and generating accurate predictions. This analytical power greatly enhances the Digital Twin's ability to simulate, optimize, and manage real-world operations.[6]

The integration of AI with Digital Twins is a key driver in the transition to more sustainable and human-centric manufacturing systems, which is in line with the vision of Industry 5.0.[2] AI increases the adaptability of Digital Twins, allowing them to dynamically change boundary conditions and operational requirements at the shop floor level.[11] This provides not only predictive behavior, but also proactive, adaptive control, which is critical for navigating the complex and fast-paced environment of modern manufacturing. In addition, the true power of Digital Twins is evident in the synergistic integration of AI, the Internet of Things (IoT), and advanced data analytics.[6] Without this interdependence, IoT data remains only raw information, and AI/ML algorithms without real data quickly become obsolete.

1.3. Overview of the applications and benefits of Digital Twins in various production sectors, with a particular focus on the food industry and SMEs

Digital twins are driving significant advances in monitoring, simulating, and optimizing manufacturing processes, resulting in improved overall efficiency, substantial reductions in operating costs, and improved product quality.[6] They enable real-time monitoring of operations, the implementation of predictive maintenance strategies, and the optimization of complex manufacturing processes. Moreover, CDs enable manufacturers to virtually simulate and test product designs and manufacturing processes before they are physically implemented, thereby reducing risk and speeding time to market.[6]

In the food industry, digital twins are specifically used to model complex supply chains, production lines, and equipment.[8] This capability allows companies to conduct "what-if" scenarios, predict potential disruptions (e.g., in the supply chain), and improve operational efficiency without impacting actual production.[8] Key applications include predictive management of perishable inventory, robust risk management (e.g., assessing the reliability of suppliers or alternative transportation routes), improved quality control through detailed monitoring (e.g., tracking seafood temperatures from catch to kitchen), and efforts to reduce environmental impact.[8] AI-based solutions, including digital twins, democratize access to advanced manufacturing capabilities, effectively leveling the playing field for small and medium-sized enterprises (SMEs).[4] These technologies streamline manufacturing processes, dramatically reduce time to market, deliver significant cost savings through automation, improve quality control, and help navigate complex regulatory requirements.[4] Empirical evidence shows that the adoption of AI has led to a significant increase in revenue (up to 34%) and operational efficiency (up to 33%) for SMEs, highlighting the vital role of AI in their growth and competitiveness.[5]

2. Detailed analysis of an intelligent neural network system

2.1. Purpose of the system and intended application

The system is officially called "Intelligent neural network system for analysis and optimization of production processes of a food industry enterprise based on a digital twin".[1] Its main goal is to create and implement an innovative neural network system that is closely integrated with the digital twin of the enterprise. This system is designed to automatically analyze the movement of employees, identify deviations from optimized plans, predict the risks of delays and offer adjustments to the schedule and tasks in real time, which is critical in the face of daily changes in orders and product flow charts.[1] The system is specifically designed for the food industry. This sector faces unique challenges such as perishable products, strict quality control and often high variability in demand. [1] This focus means that the solution is more scalable, cost-effective, and easier to implement for enterprises with limited resources compared to large enterprises.

2.2. Main functional modules and technologies of AI/ML

Automatic analysis of actual personnel movements:

- This module is responsible for the continuous collection of data from CCTV cameras strategically located on the production site. The resulting visual data is processed to accurately determine the trajectories of employees.[1]

- To analyze these complex space-time patterns and identify deviations from a predetermined optimal plan, the system uses Space-Time Graph Convolutional Networks (S-TGCN).[1] The selection of such advanced graph neural networks (GNNs) reflects a sophisticated approach to understanding dynamic human interaction in a structured environment.

Delay Prediction and Dynamic Schedule Optimization:

- To predict future deviations and potential delays, the system uses advanced Recurrent Neural Networks (RNN), in particular the Transformer and LSTM (Long Short-Term Memory) architectures.[1] These forecasts are dynamically generated based on current operational data and, critically, daily changes in the production plan, allowing the system to proactively respond to potential disruptions.[1]

- To enable real-time adaptation, the system integrates a Deep Reinforcement Learning (DRL) model.[1] This DRL component is designed to dynamically adjust the work plan, offering optimal solutions for redeploying tasks and personnel in response to the ever-changing nature of orders.[1] This represents the basic adaptive and prescriptive capability of the system.

Automated digital twin creation and real-time visualization:

- The system provides seamless integration of all processed data, including the received employee trajectories and optimized solutions generated by neural networks, directly into the digital twin of the enterprise.[1]

- The digital twin serves as a central, interactive platform that provides real-time visibility into the current state of production and proposed optimizations. This visualization dynamically takes into account different routings and inherent order variability, offering a comprehensive and up-to-date operational overview.[1]

Table 1 shows the main functional modules and associated AI/ML technologies. This table is an indispensable component of the technical report, offering a clear, concise and structured overview of the system architecture. It effectively matches specific operational tasks with the advanced AI/ML solutions used, thereby highlighting the technological complexity of the system and its multifaceted approach. For a technical audience, this visual representation makes it easier to understand the complex relationships and rationale for choosing AI models, serving as a quick reference to the system's core mechanics.

Table 1: Main functional modules and related AI/ML technologies

Function Module	Key task to be solved	Main AI/ML technologies used	Mechanism/role
Automatic analysis of personnel movements	Identification of spatio-temporal patterns and deviations from optimal plans in the trajectories of employees' movements.	Spatiotemporal graph convolutional networks (S-TGCN)	Analyzes video data from surveillance cameras to extract trajectories and compare them to predetermined optimal routes, identifying inefficiencies or bottlenecks.
Predictive analytics	Predict future deviations and potential delays in production processes.	Recurrent neural networks (RNN): Transformer, LSTM	Processes current operational data and daily changes in production plans to predict where and when delays or deviations may occur, allowing for proactive intervention.
Dynamic optimization of schedules and tasks	Real-time adjustment of work plans and optimal redistribution of tasks and personnel.	Deep Reinforcement Learning (DRL)	Learns optimal strategies through interaction with the digital twin, suggesting the most effective ways to reallocate resources and tasks in response to dynamic changes in orders and production conditions.
Automated Digital Twin and Real-Time Visualization	Integrate operational data and optimized solutions and provide a live, comprehensive view of production.	Digital Twin Platform (Integration Layer)	Serves as a central hub for integrating raw data (e.g., motion paths) and AI-generated decisions (e.g., adjusted schedules), providing real-time visibility into the current state of the shop floor and proposed optimizations.

2.3. Data requirements and integration architecture

The efficiency of a system depends heavily on a comprehensive set of inputs, which are classified as follows [: 1].

These are mainly video recordings obtained from surveillance cameras strategically located in the production hall.[1] This raw visual data is critical for the initial analysis of personnel movements. This type includes two critical subtypes:

- Flow charts: Detailed information about the different types of products, including the duration and exact sequence of operations required for each specific type of product.[1] These maps define the "optimal plan" against which deviations are measured.
- Daily optimized production plans: These are dynamic plans generated daily based on current orders, clearly defining tasks and assigned routes for each employee.[1] This data provides a dynamic basis for real-time system analysis and optimization.

To improve the accuracy of forecasting and historical analysis, the system can use additional data, such as order fulfillment reports, records of past delays, and actual variance data from previous production periods. This additional data is valuable for training and refining predictive models.[1]

The data collection and integration mechanism includes live streams from cameras for visual data and integration with existing enterprise systems (e.g., ERP, MES) for production and additional data.[1] The digital twin acts as a central integration platform where raw data (e.g., real-time motion paths) and processed, optimized solutions (e.g., dynamically adjusted schedules generated by neural networks) are seamlessly combined.[1] This integrated data environment is vital to enable real-time visualization, continuous feedback loops for AI models, and informed decision-making by operators or automated systems.[1]

2.4. Project Implementation Roadmap

The implementation of the project is structured in four separate, sequential phases 1:

1. Preparatory stage:

- Camera Installation and Calibration: This initial step involves the physical installation and accurate calibration of the security cameras at the manufacturing facility to ensure high-quality visual data collection of employee movements.[1]
- Data preparation and labeling for neural networks: A critical step that involves the thorough collection, cleaning, and annotation of the data needed to train AI models. This includes marking employee routes, specific operations performed, identified delays, and accounting for daily changes in orders.[1] This process underscores the fundamental importance of high-quality, labeled datasets to system performance.

2. Development of neural network models:

- Training graph neural networks for trajectories analysis and deviation detection: In this step, spatio-temporal graph convolutional networks are trained to accurately analyze spatio-temporal patterns in employee movements and automatically identify any deviations from the optimal production plan.[1]
- Development and training of recurrent networks for latency forecasting: Transformer (LSTM) models are developed and trained to predict potential future deviations and delays, with a particular focus on incorporating daily order variability into their predictive capabilities.[1]
- Creating and Training a Reinforcement Learning Model for Dynamic Process Management: A deep reinforcement learning model is developed and trained to dynamically control manufacturing processes, learning to propose optimal solutions to reallocate tasks and personnel in response to ever-changing orders.[1]

3. Creating a Digital Twin:

- Integration of neural network models with the existing digital twin platform: This important step involves connecting the developed and trained AI models to the existing enterprise digital twin platform. This ensures a seamless flow of analyzed trajectories and optimized solutions into a virtual representation of the plant.[1] This approach involves using existing infrastructure, potentially reducing the complexity of implementation.

- Real-time visualization system implementation: Develop an intuitive interface for a digital twin that provides real-time visualization of the current state of production and proposed optimizations. This system dynamically takes into account different routings and production plans, offering a comprehensive operational picture.[1]

4. Testing and implementation:

Extensive testing of the entire integrated system is carried out using actual manufacturing data to rigorously evaluate its performance, accuracy, and reliability under various operating conditions.[1]

Identified gaps or areas for improvement based on the results of the testing phase lead to necessary improvements in neural network models and their integration with the digital twin, improving the overall accuracy and efficiency of the system.[1]

After successful testing and improvements, the system is launched in pilot mode at a real food processing plant. This allows you to check its operation in real operation and collect important feedback for further optimization.[1]

3. Expected results

A significant reduction in the time required to complete production tasks by at least 10-15% is predicted.[1] This is a direct, measurable improvement in operational efficiency and throughput. Broader industry data shows that the adoption of AI can lead to substantial improvements in operational efficiency, with SMEs showing an average improvement of 32.71%.[5] This includes a 40% reduction in manual operations, a 25% reduction in workflow bottlenecks, and a 20% faster response time.[5] AI-powered automation can lead to significant cost savings. For example, it can reduce overhead costs by 9% and customer service costs by 30-45%.[5] While these figures are not directly related to manufacturing, they highlight the broader financial impact of AI adoption.

The system significantly increases the efficiency of operations, which is especially important in a dynamic environment with daily changes in orders.[1] This allows you to proactively solve problems rather than react to them in a "firefighting" mode. A key quality benefit is the automation and simplification of complex process management, specifically designed for small and medium-sized enterprises (SMEs).[1] This solves a significant problem for SMEs, which often operate with limited resources and less complex management systems compared to larger enterprises. The proposed project is intended to significantly increase overall productivity and significantly improve the responsiveness of the enterprise.[1] The system promises to take the entire paradigm of production management to a new level by using advanced neural network technologies specifically focused on the dynamic and volatile nature of orders typical of SMEs.[1]

The expected results of the system are fully consistent with the generally recognized advantages of Digital Twins (DDs) in production, which include increased operational efficiency, significant cost reductions and significant improvements in product quality.[6] For SMEs, AI-based solutions have been empirically proven to improve operational efficiency by approximately 33%. This is achieved through various mechanisms, such as reduced manual operations, improved process automation, and faster, more accurate data-driven decision-making.[5] The proposed system directly contributes to these documented results. In addition, the system's advanced predictive capabilities (using RNN) and dynamic optimization features (DRL-based) inherently facilitate proactive strategies similar to predictive maintenance and improved quality control. improving the overall consistency of products.[6]

4. Benchmarking: System Alignment with Industry Trends and Best Practices

4.1. Comparison of AI/ML system models with established and new algorithms in smart manufacturing

Spatiotemporal graph convolutional networks (S-TGCN) for personnel movement analysis areused to analyze complex spatio-temporal patterns of employee movements.[1] S-TGCNs are an advanced class of graph neural networks (GNNs) that are particularly efficient for processing data structured as graphs. This is ideal for capturing complex spatial and temporal relationships, such as in factory layouts and dynamic human interactions. that goes beyond the simpler methods of computer vision.[11]

Recurrent neural networks (Transformer, LSTM) for predictive analytics areused to predict future deviations and delays based on current data and daily changes in the production plan.[1] Both Transformer and LSTM models are advanced in sequence modeling and time series forecasting.[1] LSTMs are classically used for sequential data processing and long-term dependencies, while Transformer (originally developed for natural language processing) have shown excellent performance in various sequence tasks due to their attention mechanisms. Their application to predict delays, especially given the daily volatility of orders, is a standard but powerful use of RNNs in predictive analytics.[11]

Deep reinforcement learning (DRL) for dynamic optimization is used to dynamically adjust the work plan, offering optimal solutions for redistributing tasks and personnel in the face of changing orders.[1] DRL is a cutting-edge AI paradigm for teaching optimal strategies through trial and error in dynamic environments.[12] Its use for dynamic adjustment and real-time reallocation of tasks/personnel is a prime example of application in complex, multi-purpose industrial control tasks.[12] This positions the system as at the forefront of adaptive manufacturing solutions. The strategic combination of these specific, advanced AI models – S-TGCN for spatial analysis, RNS for temporal forecasting, and DRL for autonomous control – demonstrates a strong technical foundation. This multifaceted approach leverages the unique strengths of each AI paradigm to address different aspects of the complex task of optimizing production, positioning system as highly innovative and in line with the latest advances in AI for manufacturing.

4.2. Evaluation of System Functionality Compared to Typical Digital Twin Applications

The system's ability to collect real-time visual and production data and visualize the current status through a digital twin [1] directly corresponds to one of the core functionality of the DDC: "Real-time Monitoring and Control".[6] This provides continuous visibility into operations. Using the RNN to predict future deviations and delays1 is fully consistent with the Forecasting functionality of the DD, which includes predicting future states and preventing failures.[9] The ability of the DRL model to dynamically adjust plans and reallocate resources in real time [1] is a complex form of "Reactive Modeling". This functionality of the CD allows you to respond autonomously to changes, dynamically manage process variables, and recommend corrective and preventive actions.[9] This also applies to "Operations Optimization".[6] By analyzing personnel movements and identifying deviations from optimal plans [1], the system indirectly contributes to "Production Planning: Optimizing Layout, Workflow" and identifying bottlenecks in the production flow.[2] Although not explicitly stated as "quality control", the reduction of delays and variances [1] contributes to the stability of production, which is an aspect of the quality improvement facilitated by the DDC.[4] The emphasis on personnel movements and task redistribution is in line with the "operator measurement" in CD applications, improving safety and ergonomics through intelligent assistance.[2] This is a strong compliance with Industry 5.0.

Discuss how the system addresses specific challenges and opportunities for the food industry and SMEs, drawing parallels with the overall benefits of AI/CD for these sectors. The food industry faces unique and pressing challenges, including stringent product safety and quality requirements, the need to reduce costs in an environment of typically low margins, ensuring timely delivery to meet the growing and diverse demand for products, and building resilience.[9] The proposed system directly addresses some of them: it helps reduce costs (by increasing efficiency), ensures on-time delivery (by predicting and eliminating delays), and maintains quality (by optimizing processes). Built-in automation and simplification of production management in the system [1] directly benefits SMEs, which often operate with more limited resources and less complex IT infrastructure compared to large corporations. AI platforms, in general, make advanced manufacturing more accessible to small businesses, reducing time to market, providing significant cost savings through automation, and improving quality control.[4] The system's critical ability to handle "daily changes in orders" is particularly important for SMEs in the food sector, which are often faced with highly volatile demand for perishable products.[1] By providing real-time insights, proactive forecasting, and dynamic optimization capabilities, the system enables SMEs to improve their global competitiveness. It enables them to offer high-quality products faster and more efficiently, thereby overcoming traditional scaling challenges.[4]

The most distinctive feature of this system is its direct and explicit emphasis on the analysis *of human* movements in the production environment and the integration of this data into the optimization cycle. This goes beyond the typical monitoring of machines or processes, including human factors as a critical, quantifiable variable in overall operational efficiency.[1]

This approach strongly resonates with the Industry 5.0 paradigm, which emphasizes human-centricity and the concept of Human Digital Twins (HDT). HDTs are designed to reflect human characteristics with the aim of improving human-system integration, enhancing ergonomics, and creating a personalized work experience.[2] The system, by providing intelligent assistance in task assignment and workflow optimization, seeks to empower humans, not just replace manual labor, contributing to a more collaborative and efficient human-machine environment.

In addition, the system's robust dynamic adaptation to variable orders, based on deep reinforcement learning, is crucial. This allows the system to continuously learn and offer optimal solutions in highly unpredictable environments, which is a common characteristic of SME operations in the food industry. [1]

Table 2 shows the fundamental importance for fulfilling the user's request for "comparative analysis". It provides a highly structured and easily digestible comparison, demonstrating how the specific features and technology solutions of the proposed system match and, in some cases, exceed the broader capabilities and benefits of AI-driven digital twins in smart manufacturing. The table helps to contextualize the system's innovations, confirm the validity of its design decisions in accordance with established industry trends and best practices, and clearly articulate its unique advantages.

Table 2: Comparative analysis of system functions compared to common AI/CD applications in manufacturing

System Function/Aspect	Related AI/ML Technologies (Proposed System)	Common Application/Advantage of AI/CD in Manufacturing	Compliance/Innovation and Strategic Value
Real-time monitoring and data collection	Automatic analysis of personnel movements using S-TGCN.[1]	Real-time data collection from IoT 6 sensors; Continuous monitoring of physical assets/processes.[7]	**High specificity:** The direct application of S-TGCN for the analysis of human movements is highly specialized and extends the capabilities of monitoring the CD to human factors.
Predictive analytics and forecasting	Predict future deviations and delays using RNS (Transformer, LSTM).[1]	Predictive functionality (prediction of future states, failures)[9]; Predictive maintenance.[6]	**Proactivity:** Strong alignment with the predictive capabilities of the CD to anticipate problems before they occur, which is critical for perishable products.
Dynamic optimization and management	Dynamic adjustment of plans and redistribution of tasks/personnel using DRL.[1]	Reactive Modeling (Real-Time Autonomous Responses, Variable Adjustment)[9]; Operations Optimization.[6]	**Adaptive Management:** The advanced application of DRL for autonomous decision-making in the face of volatile orders, which is key to SME agility.
Digital Twin Integration and Visualization	Automated CD integrates trajectories and optimized solutions, real-time visualization.[1]	Virtual view of physical assets/processes [6]; Real-time visualization and synchronization.[8]	**End-to-end platform:** The DD serves as a central, intuitive interface that combines complex AI insights into actionable visual data.
Target industry and type of business	Food industry, small and medium-sized enterprises.[1]	General production [2]; Food industry [8]; SMEs.[4]	**Highly specialized:** Purposefully addressing the unique challenges of the food industry (perishables, variability) and SMEs (resources, scaling).

Human-centered	Analysis of actual personnel movements to identify deviations and optimize tasks.[1]	Operator Measurement [2]; Human-Centered Manufacturing, Industry 5.0, Human Digital Twins (HDT).[3]	**Pioneering:** Direct application of HDT concepts for operational efficiency, which is in line with the future trends of Industry 5.0, improving not only productivity but also working conditions.
Expected Business Impact	Reduce task execution time by 10-15%; increase in the speed of detecting delays.[1]	Increased efficiency, reduced costs, improved quality [6]; AI improves SME efficiency by ~33%.[5]	**Quantitative and strategic benefits:** Clear, measurable goals that align with the documented benefits of AI for SMEs, indicating a strong potential return on investment.

5. Conclusion

An intelligent neural network system for analyzing and optimizing production processes based on a digital twin is a highly developed and strategically important solution for the food industry, especially for SMEs. Its strengths lie in a comprehensive set of AI tools, including GNN, RNN and DRL, which provides detailed analysis of personnel movements, accurate forecasting of delays and dynamic real-time redistribution of tasks and personnel.[1] Integrating the system with a digital twin creates a powerful platform for real-time visualization and data-driven decision-making.[1]

The system perfectly aligns with the principles of Industry 4.0 and pioneers the human-centric approach of Industry 5.0, optimising the interaction between man and machine.[2] Its emphasis on dynamic adaptation to daily changes in orders directly addresses the critical need for flexibility of SMEs in a volatile market.[1]

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MATHEMATICAL MODELS OF SPECIFIC CREEP DEFORMATION OF CONCRETE

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ABSTRACT
Creep deformation of concrete is one of the important factors in the theory of calculation of reinforced concrete structures. In calculations, it appears as a creep characteristic, which is a function of the product of two quantities: the creep value and the modulus of elasticity. These quantities were obtained experimentally, so they have random deviations from a fixed value. This article presents a statistical study of one of these quantities - specific creep deformation. To determine the boundaries of possible deviations of the creep characteristic of concrete, it is necessary to statistically process the data of numerous experiments conducted by a number of scientists under various experimental conditions. To be able to properly apply them in a statistical experiment, a mathematical model was first built to eliminate these errors. To check the reliability of the constructed mathematical model, a statistical experiment was conducted, namely, for the data obtained by the formula, a statistical distribution order and a theoretical distribution law were built, the reliability of which was checked using the Pearson and Kolmogorov correlation criteria. The reliability of the constructed mathematical model was confirmed with a fairly high probability.

Intrtoduction

To determine the forces caused in statically indeterminate structures by long-term deformations, and in particular, by creep deformation of concrete, it is necessary to establish the calculated creep characteristic of concrete; this is the ultimate creep characteristic of concrete.

To achieve the goal of determining the limits of possible deviations of the concrete creep characteristics, it is necessary to statistically process the data of numerous experiments conducted by a number of scientists under various experimental conditions. To enable their appropriate application, a mathematical model was initially constructed to eliminate these errors.

According to СНиП 2.05.03-84 [1], creep limit characteristic of concrete φ_n depends on two main design values of concrete - specific creep deformation $C_{(\infty,\tau)}$ and the modulus of elasticity E_b:

$$\varphi_n = C_{(\infty,\tau)} \cdot E_b \qquad (1)$$

To determine possible deviations of φ_n from the normative, it is first necessary to establish possible deviations of its two constituent quantities and construct mathematical models for them that take into account all the main influencing factors and that will help find the probability laws of distribution of their possible deviations.

We constructed such a model based on statistical processing of 150 experimental data on the specific creep deformation of concrete, taken from the works of various scientists [2,3,4,5].

From these 150 cases, systems of equations were compiled in different variants. From the variants of coefficients calculated in this way, the corresponding coefficients were determined by the least square method.

The resulting model for predicting the specific creep deformation of concrete could be define with given equation:

$$C^{mod}_{(\infty,\tau)}=7{,}7\text{x}10\text{-}6\ \left(\frac{180}{R_b}-0{,}7\frac{35+\theta}{95}+0{,}11\frac{365-\tau}{9}+0{,}5\frac{B}{310}+0{,}1\frac{173+\Delta t}{\Delta t}+0{,}1\eta_0\right) \quad (2)$$

Where 7,7x10^{-6} - standard specific creep strain for concrete class B35 according to СНиП 2.05.03-84 [1]; R_b- prism strength of concrete under load in Mpa, for kg/cm^2; ϑ - relative humidity of the environment in %; τ - age of concrete under loading, days; B - water consumption, l/m^3; Δt - duration of long-term load, days; η_0- ratio of effective stress to prism strength; 180 - maximum prism strength in experiments used for statistical processing, kg/cm^2; 35 and 95 - minimum and maximum relative humidity of the environment in these experiments, %; 9 and 365 - minimum and maximum age of concrete under loading, days; 310 - maximum water consumption in the accepted experiments, l/m^3; 173 - minimum duration of long-term load, in days;

Results

To test the mathematical model (2) of specific creep deformation of concrete, a statistical distribution series was compiled for the ratio of experimental and model calculated values of specific deformation - $\eta_1 = {C^{exp}}/{C^{mod}}$ (Table 1).

Table 1. Statistical distribution series for η_1

η_1	0,82 0,85	0,85 0,88	0,88 0,91	0,91 0,94	0,94 0,97	0,97 1,00	1,00 1,03	1,03 1,06	1,06 1,09	1,09 1,12
m_i^*	2	7	15	24	27	27	24	15	7	2
IP_i^*	0,013	0,047	0,100	0,160	0,180	0,180	0,160	0,100	0,047	0,013

Further in the work, the following method is used for the probabilistic development of each calculated value.

With Statistical distribution series (Table 1.), m_i^* - is the quantity per each *i*-th digit; P_i^* - are the corresponding frequencies.

The mathematical expectation (Statistical Definition) for the statistical distribution [6] has following form:

$$m = \sum_{i=1}^{k} \left(\overline{X_i}\ P_i^*\right) \quad (3)$$

Where k - is the number of digits; $\overline{X_i}$ - is the average value of the *i*-th digit; P_i^* - is the frequency of the *i*-th digit. For given example m = 0,97.

To determine the variance of a statistical distribution, the second initial moment has to be defined [6]:

$$\alpha_2^* = \sum_{i=1}^{k} \left(\overline{X_i^2}\ P_i^*\right) \quad (4)$$

In this case α_2^* = 0,994. Distribution variance: $D = \alpha_2^*$ - m^2=0,944-(0,97)2=0,0031, and the standard (standard deviation) of the accepted statistical series: $\sigma = \sqrt{D}$= 0,056; coefficient of variation $\delta = {\sigma}/{m}$ =0,058.

Based on these statistical data, a probabilistic (theoretical) law of distribution of deviations of a given value is constructed, which in this case is normal and has the form:

$$f_{(\eta_1)} = \frac{0{,}028}{0{,}056\sqrt{2\pi}}\exp\left(-\frac{(\eta_1-0{,}97)^2}{2\cdot 0{,}056^2}\right) \quad (5)$$

Where 0,028 - approximation coefficient of the normal distribution curve given with Graph 1 (Chart 1) and the histogram of the statistical series with Graph 2 (Chart. 1). Values of $f_{(\eta_1)}$ at the boundaries of the categories of data provided in Table (Table 2).

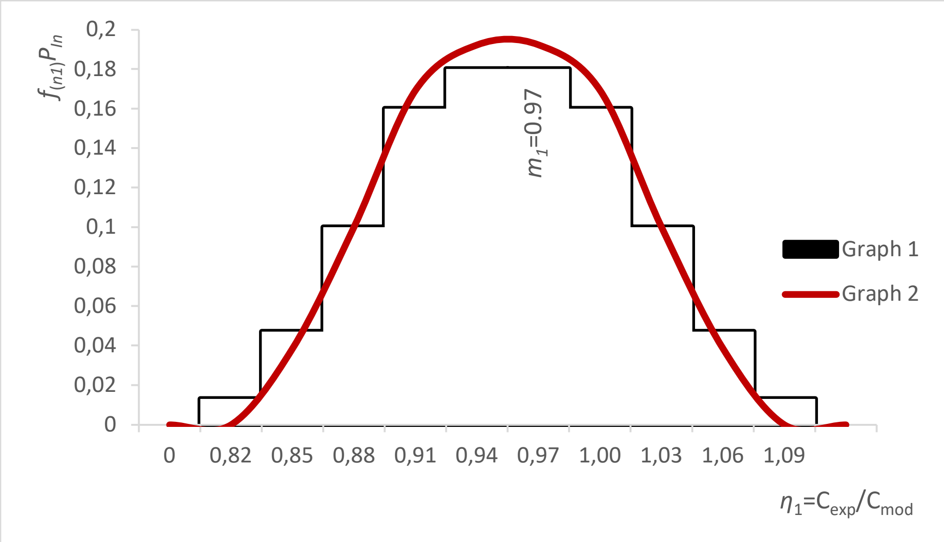

Chart 1. Graphs of distribution of random variable η_1

Table 2. Densities of normal distribution for deviations of the value η_1

η_1	0,82	0,85	0,88	0,91	0,94	0,97	1,00	1,03	1,06	1,09	1,12
$f_{(\eta_1)}$	0,0056	0,020	0,055	0,113	0,173	0,200	0,173	0,113	0,055	0,020	0,0056

To test the hypothesis about the acceptability of the normal distribution law for this case, we use the Pearson and Kolmogorov criteria of combability.

According to Pearson, we define the measure of discrepancy between theoretical and statistical distributions χ^2 with a following equation:

$$\chi^2 = \sum_{i=1}^{k} \frac{(m_i - np_i)^2}{np_i} \quad (6)$$

Where m_i - the same as m_i^*; n - number of experiments, in this case n=150; p_i – theoretical probability of a random variable entering the *i*-th digit:

$$P_i = \phi^*(\frac{X_{i+1} - m}{\sigma}) - \phi^*(\frac{X_i - m}{\sigma}) \quad (7)$$

Where χ_i , χ_{i+1} – boundaries of the i-th digit; ϕ^* - we find in table of Appendix [6].

Then a comparative table of numbers falling into the categories is compiled m_i^* and corresponding values nP_i (Table 3). According to formula (6), the measure of discrepancy is χ^2 for this case χ^2 = 2,78; number of degrees of freedom Г=К-3=10-3=7. According to χ^2 and Г using table of Appendix [6], the probability that a value having χ^2 = 2,78 и Г=7 degrees of freedom will exceed this value χ^2. For our case *P* =0,9 $> 0{,}1$. Based on this, the adoption of the normal distribution law (5) for the statistical series η_1 (Table 1) does not contradict experimental data.

Table 3. Comparative table for deviations of the value η_1

η_1	0,82 0,85	0,85 0,88	0,88 0,91	0,91 0,94	0,94 0,97	0,97 1,00	1,00 1,03	1,03 1,06	1,06 1,09	1,09 1,12
m_i^*	2	7	15	24	27	27	24	15	7	2
np_i	2,34	6,87	15,2	24,23	27,54	27,2	24,3	14,9	7,12	1,89

According to Kolmogorov, the measure of discrepancy between theoretical and statistical distributions is D^* - the maximum value of the modulus of the difference between the statistical distribution function Graph 1 (Chart 1) and the corresponding theoretical one Graph 2 (Chart 1). For statistical series η_1 (Table 1) D^* = 0,047, Kolmogorov number λ=0,047$\sqrt{150}$=0,576; according to table 7.6.1. [6] probability of agreement *P* 0,576=0,889 $>$ 0,1, therefore, the hypothesis about the acceptability of the distribution law (5) is plausible [7], [8], [9].

Discussion

The statistical experiment showed that the experimental and calculated values of the specific creep deformation of concrete obtained using the mathematical model (2) coincide satisfactorily; their average ratio is about 0.97 with a spread according to the normal statistical distribution. In this case, the variation coefficient δ=0,058.

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DETECTING CRIMINAL CONTENT ON SOCIAL MEDIA USING MACHINE LEARNING MODELS: A CASE STUDY ON KAZAKH-LANGUAGE CONTENT

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Abstract. With the increasing prevalence of harmful content on social media, there is a growing need for automated systems capable of detecting criminal discourse online. This study focuses on the detection of crime-related content in Kazakh-language social media posts using machine learning and natural language processing (NLP) techniques. A multilingual corpus was compiled from social networks, annotated into seven categories: Noncrime, Assault, Burglary, Drugs, Homicide, Sex Offense, and Extremist. Both classical machine learning classifiers (e.g., Logistic Regression, Naive Bayes, Random Forest) and deep learning models were trained and evaluated using various text vectorization methods (TF-IDF, Word2Vec, CountVectorizer). Among traditional models, Logistic Regression achieved the highest performance with an F1-score of 0.9681. BERT, used as the primary deep learning model, demonstrated strong capability in identifying nuanced criminal content, especially in under-resourced languages like Kazakh. The study underscores the effectiveness of modern NLP techniques for multilingual crime detection and contributes valuable resources for future research on content moderation in low-resource linguistic environments.

Keywords: cybersecurity, online social networks, crime detection, deep learning, neural networks

Introduction. With the rapid growth of social media, digital platforms have become not only tools for communication and information exchange but also channels for the spread of harmful and illegal content. Among the various categories of online threats, criminal content poses a significant risk to public safety and national security. This includes posts related to violence, drug trafficking, extremism, and other unlawful activities. The proliferation of such content demands the development of effective automated monitoring systems capable of identifying and mitigating risks in real time. Recent advances in machine learning and Natural Language Processing (NLP) have enabled the creation of models that can detect patterns in large-scale unstructured text data. These models are increasingly being applied to the analysis of social media content, allowing for the classification of posts that may indicate criminal behavior. However, most existing studies focus on widely spoken languages such as English, while low-resource languages, including Kazakh remain underexplored in this context.

This study addresses this gap by developing and evaluating machine learning models specifically for the detection of criminal content in social media posts written in Kazakh. A multilingual corpus was compiled from Twitter, VKontakte, and YouTube, with manual annotation into crime-related categories. Both classical machine learning classifiers and deep learning architectures were trained and compared using various text vectorization techniques. The aim is to assess the effectiveness of these models and determine optimal strategies for crime-related content detection in the Kazakh-language social media landscape.

Literature Review.

The growing spread of cybercrime, extremism, and illegal activities on social media has prompted active research into automated detection methods. Machine learning and NLP have shown effectiveness in processing such content, especially in English. However, low-resource languages like Kazakh remain largely overlooked due to the lack of linguistic resources and labeled datasets, highlighting the need for specialized models in these contexts.

Early research efforts primarily employed traditional machine learning algorithms, such as Naïve Bayes, Support Vector Machines (SVM), logistic regression, and decision trees. These models were often paired with basic vectorization techniques, such as Bag-of-Words and TF-IDF, to process text data [1]. Despite their simplicity, these models demonstrated limited effectiveness in understanding context and linguistic variability common in social media language. The advent of deep learning introduced more advanced architectures capable of capturing semantic and sequential patterns in text. Long Short-Term Memory (LSTM) networks, Convolutional Neural Networks (CNNs), and, more recently, transformer-based models such as BERT, have significantly improved the performance of text classification tasks, including hate speech detection, extremist content identification, and crime event classification [2-3].

In particular, [4] proposed CrimeBERT, a fine-tuned BERT model for detecting criminal intent in tweets. They curated a labeled dataset by filtering Twitter posts using crime-specific keywords (e.g., murder, assault) and demonstrated that BERT significantly outperformed traditional models in precision and recall. Their work emphasized the importance of domain adaptation for better context modeling. Mohanty et al. [5] extended this idea by implementing domain-adaptive pretraining on crime-related tweets. They created a task-specific dataset using Twitter's public API and manually annotated it across crime categories such as theft, violence, and fraud. Their experiments showed that fine-tuned BERT outperformed baseline models like logistic regression, SVM, and LSTM, highlighting the benefit of contextual embeddings trained on relevant domains.

Authors [6] explored sentiment-based crime prediction using tweets collected from U.S. cities with high crime rates. They extracted geolocated tweets, filtered them with crime-relevant lexicons, and analyzed them using SVM and Random Forest classifiers. Although their model focused on predictive trends rather than classification, it introduced a valuable perspective on how sentiment analysis can complement crime monitoring efforts. In the field of drug-related crime detection, [7] conducted a study on Facebook and Instagram posts, leveraging a slang-based dictionary to extract illegal drug-related content. Using TF-IDF and Word2Vec representations, they compared Naïve Bayes, SVM, and CNN classifiers. Their results demonstrated the superiority of CNNs in capturing complex slang and context, which is critical in detecting covert criminal discourse. In [8] working with Arabic, a low-resource language, developed a corpus of abusive and offensive tweets by scraping data using sensitive keywords. They applied morphological preprocessing and trained models such as SVM, Random Forest, and LSTM. Their results highlighted the challenges of dealing with informal morphology and the importance of custom preprocessing in underrepresented languages.

In earlier works, the authors conducted foundational research on criminal content detection in the Kazakh language. [9] examined the application of LSTM networks for identifying extremist messages. They compiled and annotated a dataset from various social media platforms and demonstrated that deep sequential models, especially LSTM, performed well in binary classification tasks. In a subsequent study [10] expanded the focus to general crime-related text analysis, employing machine learning techniques such as logistic regression, decision trees, and neural networks to detect criminal indicators in Kazakh-language data.

The present study builds upon these earlier efforts by extending the task to multi-class classification, introducing seven crime-related categories: Noncrime, Assault, Burglary, Drugs, Homicide, Sex Offense, and Extremist. It also evaluates a wider range of models—including BERT, DoubleLSTM, and CNN and systematically compares the impact of different vectorization techniques (TF-IDF, Word2Vec, CountVectorizer). Thus, this work represents a significant step toward comprehensive, automated monitoring of criminal discourse in Kazakh-language social media.

Methodology. The development of a machine learning model for detecting criminal content on social media comprises several key stages: data collection and preprocessing, model selection and training, followed by evaluation and optimization. The architecture of the proposed method for detecting criminal texts in the Kazakh language is presented in Figure 1.

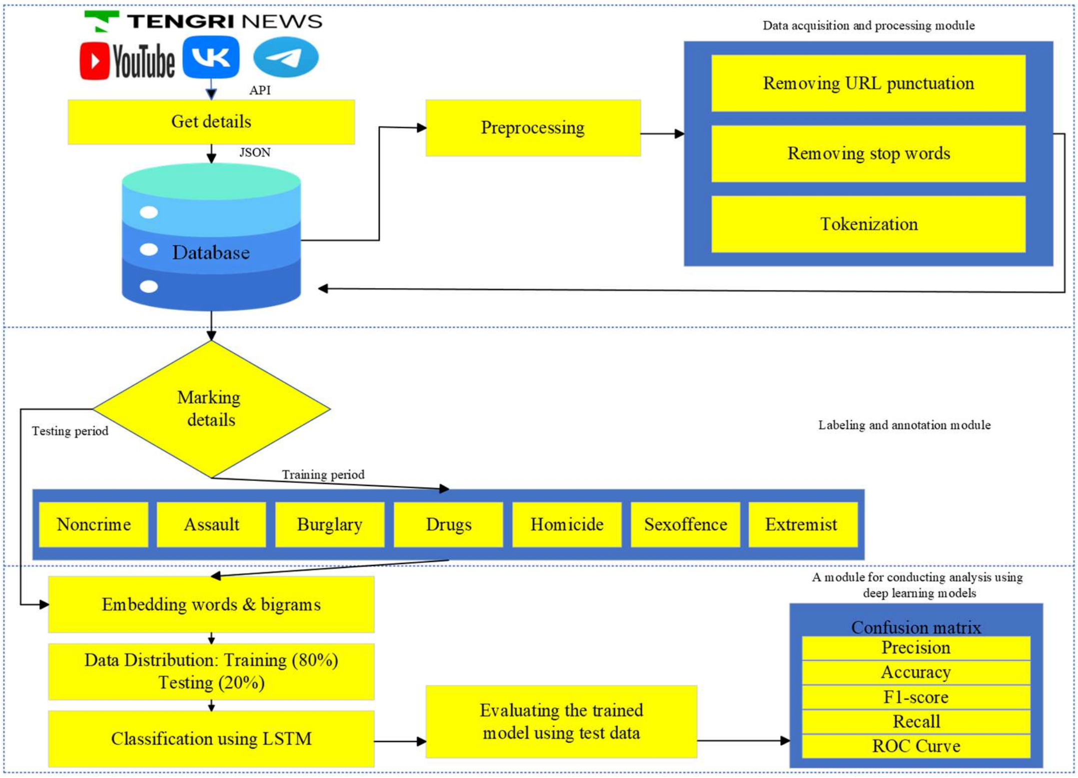


Figure 1 – Architecture of the proposed method for detecting criminal texts in the Kazakh language

1. Data Acquisition and Preprocessing. The first phase focuses on gathering text data from publicly accessible social media platforms by leveraging their respective APIs to retrieve user posts, comments, and video captions. Since user-generated content is typically unstructured and contains a high level of noise, an extensive data cleaning process is required. This includes filtering out URLs, emojis, and non-alphanumeric symbols, along with standardizing mixed-language and informal text entries. To ensure linguistic uniformity and prepare the data for analysis, core natural language processing (NLP) procedures are applied, including text segmentation (tokenization), the elimination of non-informative words (stop-word removal), and the transformation of words to their base forms through lemmatization.

The compiled corpus comprises a total of 20,217 textual entries. Each record associated with criminal content is structured into four distinct fields: a unique message identifier, the full text of the message, a binary attribute marked as “1” to indicate the presence of criminal elements, and a categorical label specifying the type of criminal content (as illustrated in Figure 2).

2. Model Selection and Training. For the task of criminal content classification, a diverse set of machine learning techniques was explored, encompassing both traditional algorithms and cutting-edge language models. Among the conventional approaches, logistic regression was employed due to its efficiency and interpretability, particularly in binary classification settings. Random forest, a robust ensemble method, was used to enhance prediction stability by combining the outputs of multiple decision trees. Support Vector Machines (SVM) were also considered for their capacity to construct optimal decision boundaries in high-dimensional feature spaces. In addition, the study incorporated modern deep learning models based on transformer architectures, most notably BERT, which excels at understanding the semantic and syntactic context of words within a sentence critical for handling the informal and often ambiguous language found in social media texts. All models were trained using supervised learning techniques on a manually labeled dataset, categorized into multiple crime-related classes. This allowed for a comprehensive comparison of algorithmic performance and provided insight into the relative strengths of classical versus neural network-based approaches when applied to low-resource languages like Kazakh. The results informed the selection of optimal models for further experimentation and real-world deployment.

	A	B	C
1	message	label	label_name
2	полиция уилкокс округінде жасар бала мектепке мылтық әкелгеннен кейін мылтық атылды а	1	assault
3	детективтер нью йорк даңғылы мен парк пл маңында болды олар екі ер адамның мылтықпе	1	assault
4	жақында кадомада полициямен оқ атқаннан кейін тұтқындалған банда мүшелерінің ұсталға	1	assault
5	вичита хайтс орта мектебінің жанындағы ауданда атыс дегі жаңалықтар	1	assault
6	мысыр қайықтары теңізде балықшыларға оқ жаудырғаннан кейін жастағы газалық балықшы	1	assault
7	техникалық қоршау зикким атыс пен жарылыс дыбыстары жарылыс хабарламалар бойынш	1	assault
8	мемфистің оңтүстік шығысында дүйсенбі күні түстен кейін депутаттардан қашпақ болған екі	1	assault
9	лас вегастағы сауда орталығында атыс стриптегі сауда кешенінде атыс болып адам жарала	1	assault
10	техас тас жолында атыс кезінде жасар қыз жараланды	1	assault
11	шығыс джорджияда мемлекеттік сарбаз күдікті көлік қозғалысын тоқтату кезінде оқ жаудырд	1	assault
12	филадельфияда нысаналы автотұрақта атыс болып бір адам қаза тауып тағы адам ауыр жа	1	assault
13	сот құжаттарына сәйкес ер адам офицерлермен күрескеннен кейін соққыға жығылған бірақ	1	assault
14	тітіркендіргішті басқан жастағы жасөспірім заңды және лицензиясы бар қару иесі болған дег	1	assault
15	фото боко харам мүшелері бір біріне қару бұрып бірнеше адам қаза тапты елдің солтүстік ш	1	assault
16	авантипора пулвама кездесуі үкімет күштері мен содырлар арасындағы қақтығыс сағаттан к	1	assault
17	канзас ситидегі түнгі клубтың сыртында оқ жаудырып бір әйелді өлтіріп кем дегенде адамд	1	assault
18	шығыс джорджияда түнгі клубтың сыртында оқ жаудырып бір әйелді өлтіріп кем дегенде ад	1	assault
19	вичита хайтс кездесуі үкімет күштері мен содырлар арасындағы қақтығыс сағаттан кейін қай	1	assault
20	зикким газаның солтүстігінде теңізде балықшыларға оқ жаудырғаннан кейін жастағы газалы	1	assault

Figure 2 – Example of messages extracted from the corpus

3. Evaluation and Optimization. The performance of the classification models was systematically evaluated using widely accepted quantitative metrics. These include accuracy, which reflects the overall correctness of model predictions across all classes; precision, measuring the proportion of correctly identified positive instances among all those predicted as positive; and recall, which indicates the model’s ability to detect actual positive cases within the dataset. To provide a balanced measure that accounts for both precision and recall, the F1-score their harmonic mean was also computed. To enhance model performance, several optimization strategies were employed. One of the key challenges addressed was class imbalance, particularly the overrepresentation of non-criminal content in the dataset. To counter this, resampling techniques were applied: oversampling was used to increase the presence of underrepresented classes, while undersampling helped reduce the dominance of frequent categories. Additionally,

hyperparameter tuning was conducted to refine each model's internal settings and improve generalization.

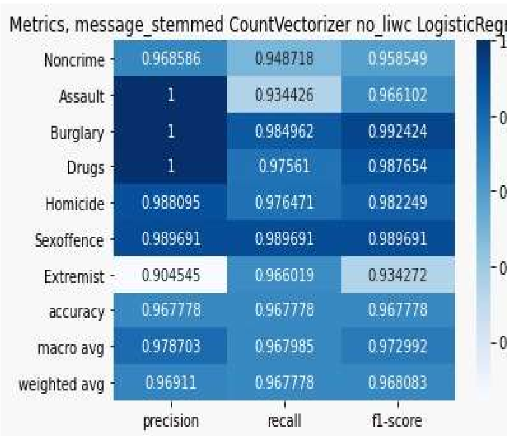
Building on the findings presented in earlier studies [9–10], the scope of the current research was extended from binary to multi-class classification, enabling a more nuanced identification of criminal content in Kazakh-language social media. The annotated dataset was reorganized into seven distinct categories, each corresponding to a specific type of criminal discourse. These include: Noncrime (neutral or unrelated to criminal activity), Assault (mentions of violence or physical aggression), Burglary (references to theft or unlawful entry), Drugs (mentions of narcotics or trafficking), Homicide (references to murder or intentional killing), Sexoffence (content involving sexual harassment or abuse), and Extremist (texts promoting radical ideologies or inciting violence). This more detailed classification framework allows for improved precision in the detection of diverse criminal narratives and supports deeper insight into the linguistic and thematic patterns of online crime-related communication in under-resourced languages like Kazakh.

The performance comparison of three classification algorithms Logistic Regression, Multinomial Naive Bayes, and Random Forest Classifier is summarized in Table 1. Among these, Logistic Regression yielded the most accurate results, achieving a precision of 0.9691, recall of 0.9678, accuracy of 0.9678, and F1-score of 0.9681. The MultinomialNB model followed closely, with slightly lower values across all metrics: precision (0.9642), recall (0.9633), and F1-score (0.9635), indicating consistent but marginally reduced performance.

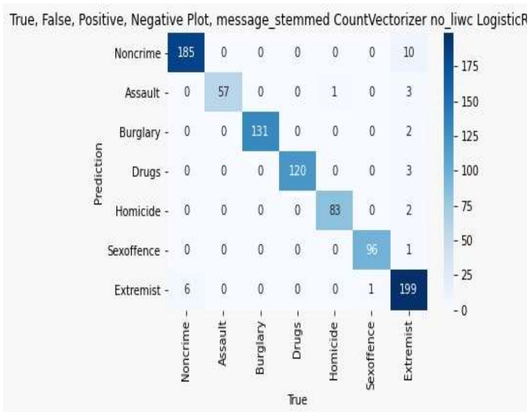
Table 1 – Key performance comparison of different methods for criminal content classification

algorithm	precision	recall	accuracy	f1
Logistic Regression	0,9691	0,9678	0,9678	0,9681
MultinomialNB	0,9642	0,9633	0,9633	0,9635
RandomForest Classifier	0,9561	0,9544	0,9544	0,9549

The Random Forest Classifier showed the lowest scores among the three, with precision at 0.9561, recall at 0.9544, and F1-score at 0.9549. These results suggest that, for this specific task of classifying Kazakh-language criminal content, linear models such as Logistic Regression may offer superior performance compared to ensemble-based methods (Figure 3).



A) Performance metrics for the Logistic Regression algorithm

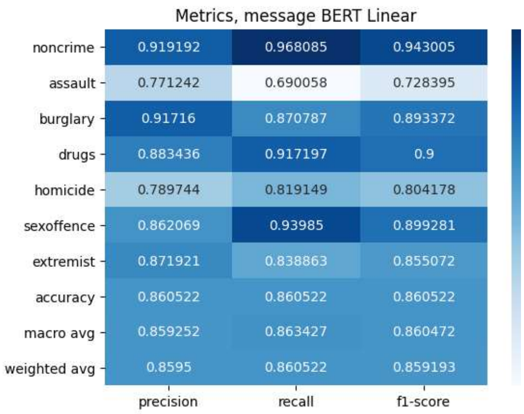


B) Confusion matrix for the Logistic Regression algorithm

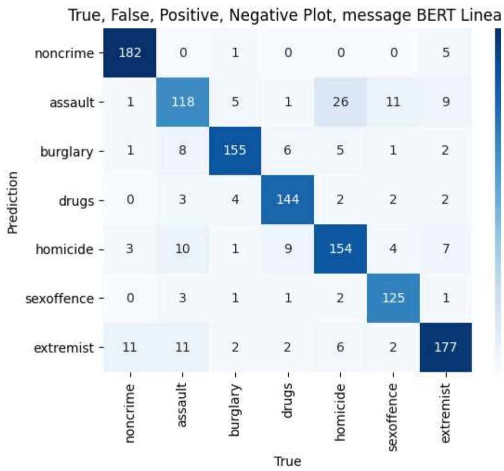
Figure 3 – Classification results of texts using machine learning models and various vectorization methods

In this study, BERT (Bidirectional Encoder Representations from Transformers) was employed as the primary deep learning model for the classification of criminal content in texts. Due to its state-of-the-art performance in various natural language processing tasks, BERT was selected for its ability to understand contextual meaning at a deep semantic level. Originally developed by Google in 2018, BERT marked a breakthrough in NLP by introducing bidirectional context modeling, where the representation of each word is informed by both its left and right context within a sentence. Unlike traditional models that process text sequentially, BERT is based on transformer architecture, enabling it to capture complex dependencies between words and phrases regardless of their position. This deep contextual awareness allows BERT to excel in high-level NLP tasks such as text classification, sentiment analysis, and question answering. In the context of this research, BERT's ability to distinguish nuanced language patterns made it particularly suitable for identifying subtle indicators of criminal, extremist, or harmful content within social media posts. Its general-purpose pretraining and fine-tuning capabilities contribute to robust performance, even in low-resource language settings like Kazakh.

The results of BERT's performance in this study are illustrated in Figure 4. Each cell represents the value of a specific metric (e.g., precision, recall, F1-score) for a corresponding class, while color saturation indicates performance intensity the darker the color, the higher the metric.



A) Performance metrics for the BERT model



B) Confusion matrix for the BERT model

Figure 4 – Text classification results using deep learning models and various vectorization methods

The Noncrime class achieved the highest values across all three metrics (precision, recall, and F1-score), with scores reaching 0.95, indicating that the model reliably identifies non-criminal content. The Drugs and Burglary classes also showed high metric values, reflecting the model's strong performance in recognizing these categories. In contrast, lower scores were observed for the Assault and Homicide classes, suggesting greater classification difficulty potentially due to ambiguous language or insufficient training data for those categories.

Conclusion. This study presents a comprehensive approach to detecting criminal content in Kazakh-language social media posts using both traditional and deep learning-based text classification models. A manually annotated corpus consisting of over 20,000 entries was developed and categorized into seven crime-related classes. Through systematic evaluation, logistic regression emerged as the most effective classical algorithm, while the BERT model demonstrated superior performance in capturing complex linguistic nuances, particularly in distinguishing subtle indicators of criminal behavior. The results highlight the feasibility and effectiveness of using machine learning and NLP techniques for crime detection in low-resource languages. The study also demonstrates the potential of transformer-based models like BERT in handling the informal and multilingual nature of social media content, where traditional models often fall short. Future work will focus on expanding the dataset and exploring real-time deployment possibilities.

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Historical Sciences

Ұлы зұлмат жылдарындағы қуғын-сүргін және босқыншылық

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Аңдатпа. Мақалада 1931-1933 жылдардағы ашаршылықтың қазақ халқының болашағына, көші-қоңы мен шаруашылығына тигізген зардабы пайымдалып, кеңес билігінің байларға қарсы жүргізген науқанының себептері мен салдары сараланады. Жекелеген байлар мен зиялылардың үстінен қозғалған істер қарастырылып, шетелге босып кеткен қазақтардың қайғылы тағдырына дереккнамалық талдау жасалды.

Тірек сөздер: ашаршылық, босқындар, байларды қудалау, тәркілеу, ұжымдастыру.

1931-1933 жылдардағы ашаршылық қазақ халқының қырылып, ұлт ретінде сақталуына қауіп-қатер төндірген аласапыран кезең еді. Кеңес үкіметінің шабындық және егістік жерлерді бөлу, жаппай ұжымдастыру, отырықшыландыру, байларды тәркілеу және байларды тап ретінде жоюға бағытталған саясаты қазақ халқының тең жартысының жер бетінен жойылып, 1 млн-ға жуық қазақтың шетелдерге ауа көшуіне алып келді. Бұл бұлғақ уақыты қазақ халқының титулды ұлт мәртебесінен айрылып, қазақ жеріне келімсектердің келіп, еліміздің көпэтникалық мемлекетке айналуының алғышартын жасаған еді. Кеңес үкіметі өз билігін заңдастыру үшін қазақ даласындағы байлардың ықпалын азайтқысы келді. Ол үшін олардың мал-мүлкін тәркілеп, кедейлерге тең тарату сынды социалистік тәсілдерді пайдалану ұсынылды. Шаруалар ұжымшарларға біріктіріліп, жаппай қоғамдастырылу қажеттілігі айтылды. Кеңес билігі байларды кедейлерді қанаушы және жәбірлеуші ретінде көрсетіп, оларды тап ретінде жоюға тырысты. Байлар мен кедейлердің арасында ежелден бері келе жатқан таптық қайшылықтар экономиканың өрлеуіне тосқауыл қойып, бөгет жасап жатыр деген ой алға тартылды. Кеңес үкіметіндегі теоретиктер бұл ойды ғылыми тұрғыда негіздеуге тырысса, әкімшіліктегі қызметкерлер арнайы комиссия құрып, байларға қарсы күреске дайындала берді. Дегенмен, ғалымдардың көбісі қазақ қоғамының арасында таптық қайшылықтар болмағанын растайды. Әлихан Бөкейхан мен Ахмет Байтұрсынұлы қазақ шаруаларының арасындағы рулық және жалпықазақтық мүдде таптық мүддеден басым түсіп жатады деп мәлімдеген.

Байларға қарсы күрестің алғышарты ретіне алдымен шабындық және егістік жерлерді үлестіру қажет еді. Семей губерниясындағы 17154 десятина, Орал губерниясындағы 84605 десятина, Жетісу губерниясындағы 31961 десятина және Қостанай округіндегі 17365 десятина шабындық және егістік жерлер 1926-1927 жылдары байлардан тартып алынып, кедейлерге берілді [1, 32 б.].

Байлардың жалпы қазақ халқының құрамындағы үлес салмағы 1924–1925 жылдары 0,2 пайыз, 1925–1926 жылдары 0,6 пайыз, 1926–1927 жж. 1,1 пайыз, ал 1927–1928 жж. 1,3 пайыз болған [2, 231 б.].

Байлар отырықшыландыру мен жаппай қоғамдастыру саясатына қарсы болған. Елде байларды тәркілеу саясатын заңдастыру үшін Қазақ КСР ОАК және Қазақ ХКК жанынан арнайы комиссия 1927 жылы желтоқсанда құрылды. Төраға болып Елтай Ерназар бекітіліп, құрамына Ораз Жандос, Нығмет Нұрмақұлы, Ораз Жанұзақұлы Иса және Ғаббас Тоғжанұлы кірген. Көп ұзамай 1928 жылы 27 тамызда байларды тәркілеу жөнінде қаулы шықты. Байлар «ірі байлар» және «аса қауіптілер» деген санаттарға бөлінді. Бірінші топқа ақсүйек болып, бек, би атағын пайдаланып, феодалды құрылысты сақтауға тырысатын топ өкілдері жатқызылды [2, 232 б.]. Бастапқыда 696 бай қожалықтары тәркіленді деп есептелінді. Соңғы деректер бойынша барлығы 1034 бай қожалықтары тәркіленген болып шықты. Байларды тәркілеумен қатар, партияның 15-құрылтайындағы шешімі бойынша қожалықтарды ұжымдастыру көзделді.

Мұхаметжан Тынышбайұлы БМСБ тергеушісіне берген жауабында Халел Ғаббас, Жағыпар Сұлтанбек, Міржақып Дулатұлы арқылы бұл шешімге қарсылық танытуға тырысқанын айтты. Ірі ұжымшарларды құрмай, шағын ұжымшарларды құру қажеттілігін, мал-мүлік иелердің қолында қала бергендігі дұрыс деген пікірде болғандығын білдірді. Барлық алаш зиялылары да осындай пікірде болған. Мұхаметжан Тынышбайұлы қазақ арасында рушылдық басым болғандықтан, мал-мүлік үшін талас-тартыс туады деп санап, рулық тәртіпті сақтай отыра, ұжымшарларды құруға болады деп есептеді [3]. Алаш зиялыларын кеңес үкіметі тыңдамағаны түсінікті. Қармысов, Алыненский, Асылбекұлы байларды тап ретінде жою комиссиясына кіріп, байлардың мүлкін тартып алып, кедейлерге тарату ісіне ерекше белсенділік танытқан еді. 225 972 малды тәркілеу жоспарланған еді. Ақыры тек 145 мыңға жуық малды ғана кеңес билігі жинай алған [1, 35-36 бб.]. Орташаларды тәркілеген қызыл әскерлер олардың киімін, аяқ киімін және жастығын тартып алып, иемденген. Кейбір заттарын сатып, пайда көрген. Үйшікті 60 тиынға, ал сиырды 15 тиынға сатқаны белгілі болды [4, 276 б.]. Байларды тәркілеген соң, кеңес билігі 44 мың мал мен ауылшаруашылық құралдарын ұжымшар және кеңшарларға берді. 84 599 мың мал 25 мыңға жуық кедейлерге берілді [4, 277 б.].

Ұжымдастыру саясатын жүргізе отырып, кеңес билігі тап арасындағы қайшылықты жасанды түрде қоздыра түсті. Билікті сіңірі шыққан тақыр кедейлерге беріп, байлардан өшін алуға жағдай жасаған. Кедейлерден арнайы комиссия жасақталып, кімді тәркілеп, кімді таңдау құқығынан айырып, басқа жерге күштеп көшіруге болатындығы жайында кеңес жүргізген болатын.

Бұл саясаттың салдарынан ел жаппай аштыққа ұшырады. Ашаршылық 1930 жылдың қысынан 1933 жылдың қысына дейін созылды. Жергілікті билеушілер тәркілеу барысында тек байларды емес, орташалар мен кедейлерді тәркілеген. Заңсыздықты болдыртпауға тырысқан белсенділер тұтқындалып, жауапқа тартылды. Кеңес билігі 1928-1930 жылдары байларға қарсы ұйымдастырылған саясат жүргізілген кезде алаш зиялыларын да біртіндеп түрмеге қамады. Астық сұраған, астықты Мәскеуге тасымай, халыққа таратқандар қатаң жаза тартты. Ашыққандар егіс алаңдарына барып, бидай жинаған үшін де жазаланған. 55 мың адам тұтқынға алынып, 2 мыңы атылды [5, 134 б.].

1930 жылы 19 ақпанда БК(б)П «Қуатты шаруалар мен байларға қарсы күрес жүргізу туралы» қаулы шығарып, байларға қарсы науқан жүргізіліп, елдегі ақсүйектер мен шонжарлар елден қуылды [2, 228 б.]. 281 230 шаруа қожалығы 1930 жылдың басынан 1931 жылдың ортасы аралығында Қазақстаннан көшіп кетті. Қазақстанда 225 мыңға жуық босқын болды [6, 82 б.]. 1931-1932 жылдары өз қонысынан ауа көшу барысында ел 300 мың қожалығынан айырылды. Бұл, шамамен, 1,5 миллион адам [6, 83 б.].

1930 жылы Қытай асуға тырысқан 10 636 адам, ал 1931 жылы 15 мың адам ұсталған. 20 мың қазақ босқыны Түркіменстанға барып, елге қайтпау үшін төлқұжаттарында қарақалпақ деп жазылып, кеңес билігінің құрығынан аман қалған [7, 147 б.].

Өзбекстан мен Түркіменстанға көшкен қазақтар уақыт өте келе елге қайтқысы келетінін білдірген. Олар жаңа жерге бейімделе алмағандықтан, онымен қоса, олардың есек пен түйе сынды көліктерді тартып алу жайттары белең алғандықтан, меселдері қайтып, елге оралуға рай танытатын [7, 153 б.]. Манаш Қозыбаевтың дерегінше, елде 1 млн 70 мың адам босқыншылыққа ұшырады [8, 230 б.].

Қазақстан үкіметінің 1933 жылы Мәскеуге берген есебінде шаруа қожалығы 490 мыңға, ал ауыл халқы 2,6 миллионға азайғанын мәлімдеген [9, 258 б.].

Қырғызстанға босып кеткен қазақтардың көбісі Бішкек теміржолында тамақ сұрап, кезіп жүрген. Басында қырғыз билігі босқындарды кері қайтаруға тырысқан. Кейін тамақ бере бастады. Ораз Иса босқындардың қай жерде орналасқанын біліп, елге қайтаруға бұйрық берді. Алайда, қазақтардың көбісі сол қырғыз жерінде қала берді [9, 270 б.].

Өзбекстан үкіметі қазақ босқындарына арнап 515 мың сом ақша бөлді. Өзбекстанда қазақтар босып жүрген аудандарда 22 асхана ашылды. Күніне берілетін астың саны 298-ден 929-ға артқан болатын. Сөйтіп, өзбектер қазақтарды ажал аузынан құтқарып алды. Өзбекстандағы қазақтарды елге қайтару міндетін Ұзақбай Құлымбетұлы мойнына алады. Жетім балаларға арнап үй салып, біраз қазақтарды қайтара алса да, көпшілік қазақтар қуғын-сүргіннен шаршап, Өзбекстанда қалып қойды [9, 271 б.].

Шығыс Қазақстан облысынан Қытайға тек байлар емес, орташалар мен кедейлер де қоныс аударған. Қытайға бет бұрғандардың ішінде белгілі Райымжан Мәрсекұлы еді. Ол көтерілісшілерді біріктіріп, кеңес билігіне қарсы күш жинау міндетін өз мойнына алғандығы жөнінде дерек бар. Райымжан Мәрсекұлының нұсқауымен көпшілік қауым Қытай асты. Көтерілістің негізгі қозғаушы күші – байлар емес, кедейлер болғандығын мұрағат құжаттары да растайды [1, 40 б.].

Байлармен қатар олардың отбасылары да қуғын-сүргін көрген. Алматы округінде 82 байдың қожалықтарымен қатар 800-ге жуық адамның тағдыры әбден талқандалып, болашақтары бұлыңғыр болды [10, 369 б.]. 82 байдың ішінен Базарбай Мәметұлы кезінде Шура-Ислами және Алашорда үкіметінің мүшесі болып, елге ықпалын жайған белгілі бай болатын. Жетісуда екі алаш жасағын құрып, автономияны күшейтуге өз еңбегін сіңірген болатын. Байырша Абылайханұлы – төреден шыққан би, азамат соғысында Анненков жасағы сапында күресіп, азамат соғысы біткенде Қытайға ауған болатын. "Кеңес үкіметіне қарсы көтеріліс бастамақ болды" деп айыпталды. Әлібек Әшімұлы кедейлерді қанаған бай, ал Есенғұл Маманұлы "мектеп ашып, алаштың көсемдерінің тірегі болып, большевиктерді қолдаған қазақтарды жазалады" деп айыпталған [10, 370-371 б.].

Қасымхан Алтынсарин Қостанай облысында 1916 жылғы ұлт-азаттық көтеріліс кезінде хан болып, халықты қанап, кеңес үкіметі билікке келген кезде малын өз інісі Жүніске беріп, жауапкершіліктен қашты деп жауапқа алынған еді. Ол тәркілеуге ұшыраған. Қасымхан Алтынсарин – белгілі Ыбырай Алтынсариннің інісінің баласы еді [11, 70 б.].

Осы қайғылы жылдары 1,5 млн адам босқыншылыққа ұшырап, олардың 200 мыңы Қытай асты. 1930-1931 жылдары босып кеткен қауым өз малдарын тастап, шекарадан заңсыз өткен болатын. 286 мың отбасы осы жылдары Республиканы тастап кеткен [12, 242 б.]. 1927 жылы Голощекин ұжымдастыру саясаты байларға, феодалдарға, алашордашылар мен контрреволюционерлерге қарсы бағытталғанын мәлімдеді. 1928 жылы қазақтарды әскери қызметке шақыру басталды. Халық оған қарсылық танытқан еді. Қазақтар тек ұлы зұлмат жылдарынан кейін еуропалық халық өкілдерімен бірге әскери міндетті болды.

Онымен қоса, ұжымдастыру мен байларды тәркілеу саясаты қазақ даласына басқа халық өкілдерін көшіруге жағдай жасап берген еді. 1927 жылы Нығмет Нұрмақұлы мен Жағыпар

Сұлтанбекұлы басқа халықтарды қазақ еліне көшіруді патша үкіметінің шаруаларды қоныс аудару саясатының тікелей жалғасы деп атап, бұл саясатқа қарсылық танытқан еді [13, 153 б.]. Байлар тап ретінде жойылып, елде таптық теңдік қалыптасты деп жарияланғаннан кейін, елді отырықшыландыру үдерісін тездету қажет еді. Голощекин 1932 жылы елде 230 мың көшпелі отырықшыланды деп дабыра қылса, 1933 жылы Киселев комиссиясы тек 70 500 адам отырықшыланғанын мәлімдеп, Голощекиннің ақпаратын жоққа шығарды [13,179 б.]. 1933 жылы Голощекиннің орнына Мирзоян келіп, жеке меншікте ұстауға болатын қой мен ешкінің санын 100-ден 150-ге, ал сиыр санын 5-тен 7-ге арттырды. Көшпелілерден бұрынғыдай салық алыну тоқтатылып, біртіндеп шаруашылығын қалпына келтіруге жағдай жасалды. Басқа ел мен аудандарға босып, көшіп жерген қазақтардың көбісі өз жерлеріне қайта оралды. Алайда, осы жолы оларға бұрынғыдай көшпелі мал шаруашылығымен айналысуға мұрсат берілмеді. Олар күштеп отырықшыландырылды. Шаруаның бір тобы егіншілікпен айналысса, бір тобы зауыт-фабрикада, бір тобы шахтада жұмыс тапты. Осылайша, кеңес билігі қазақтардың ежелден бері айналысып жатқан дәстүрлі қоғамы мен шаруашылығын әбден күйзелтіп, халықты титықтырып, адам айтқысыз ауыр халде қалдырды.

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Geographic Sciences

Ғарыштық мониторинг негізінде ауылшаруашылық жерлердің деградациясын зерттеу

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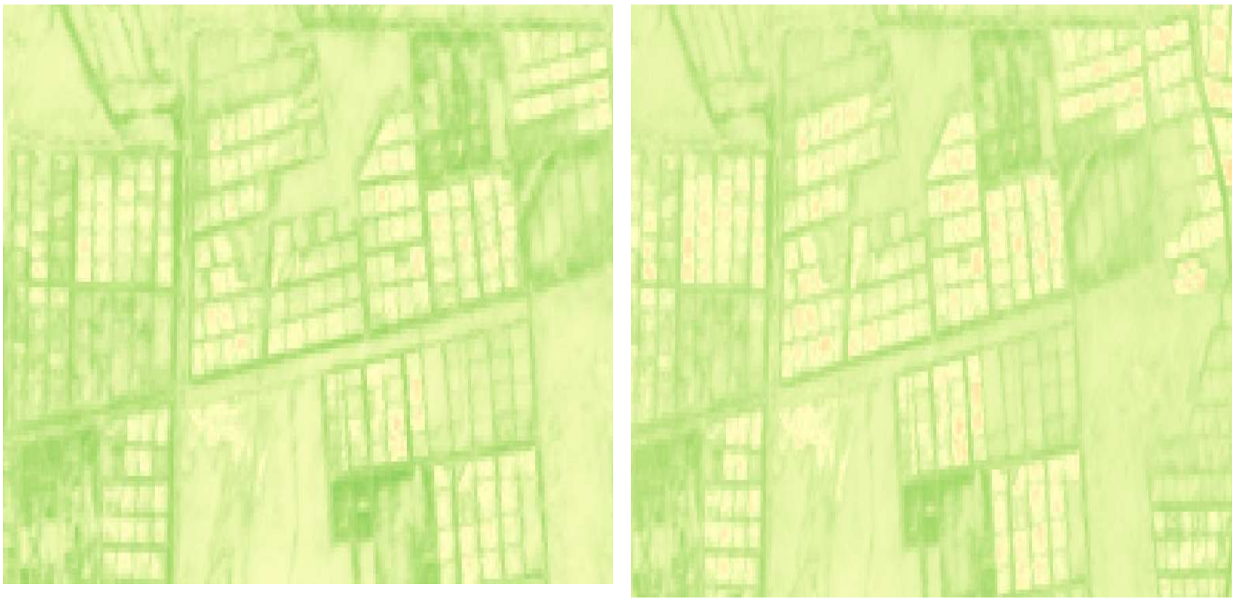
Аңдатпа. Бұл мақалада ғарыштық мониторинг пен геоақпараттық технологиялар көмегімен Түркістан облысындағы ауылшаруашылық жерлерінің деградациясын зерттеу нәтижелері қарастырылған. Жердің тозу түрлері, себептері мен ауқымы ғарыштық суреттер арқылы талданып, NDVI индекстері негізінде деградацияның деңгейі бағаланды. Зерттеу нәтижелері деградацияға ұшыраған аумақтарды нақты анықтап, оларды қалпына келтіру бойынша ұсыныстар ұсынуға мүмкіндік берді.

Түйін сөз. ауылшаруашылық жерлер, деградация, ғарыштық мониторинг, NDVI, ГАЖ, Түркістан облысы.

Ауылшаруашылық жерлердің тозуы – жаһандық және өңірлік деңгейде экологиялық және экономикалық мәселеге айналған күрделі процесс. Қазақстандағы көптеген өңірлерде, соның ішінде Түркістан облысында, топырақтың физикалық, химиялық және биологиялық қасиеттерінің нашарлауы ауылшаруашылық өнімділігіне кері әсерін тигізуде. Бұл мәселені шешуде ғарыштық мониторинг пен ГАЖ технологиялары маңызды құрал ретінде танылуда.

Зерттеу барысында келесі әдістер қолданылды:

- Қашықтықтан зондтау (ҚЗ) – LANDSAT 8 және Sentinel-2 спутниктік суреттері пайдаланылды;
- NDVI (Normalized Difference Vegetation Index) – өсімдіктердің өнімділігін және деградация деңгейін бағалау үшін;
- ГАЖ-талдау – ArcGIS және QGIS платформаларында кеңістіктік деректерді өңдеу және картографиялау;
- Картографиялық модельдеу – деградация карталарын құру және оларды санаттарға бөлу;
- Қосалқы материалдар – Түркістан облысының жер ресурстары жөніндегі ресми дереккөздері, метеорологиялық мәліметтер және агроөнеркәсіптік карталар қолданылды.



1 сурет - 2010–2024 жылдар аралығындағы спутниктік суреттерді салыстыру

Нәтижелер

NDVI индексі бойынша деградацияны бағалау

2010–2024 жылдар аралығындағы спутниктік суреттерді салыстыру негізінде өсімдіктер жамылғысының айтарлықтай азаюы тіркелді. NDVI мәнінің төмендеуі, әсіресе жаз айларында, егіншілікке жарамды жерлердің өнімділігінің әлсірегенін көрсетті. Бұл жайт деградацияның прогрессивті сипатта екенін көрсетті.

Деградация түрлерін айқындау

Зерттеу нәтижесінде Түркістан облысында келесі негізгі тозу түрлері анықталды:

Жел эрозиясы – ашық жазықтар мен жел өтінде орналасқан жерлерде;

Құрылымдық тозу – жиі өңделетін егістік алқаптарда, әсіресе суару мен ауыр техника әсерінен;

Шөлейттену – су тапшылығы бар оңтүстік аудандарда байқалды;

Қайта тұздану – бұрынғы суармалы жүйелерде ылғал мен тұз теңгерімінің бұзылуы салдарынан.

Картографиялық өнімдер

Геоақпараттық жүйелерде деградацияға ұшыраған аумақтардың картасы жасалды. Бұл картада деградация деңгейі үш санатқа бөлінді: төмен, орташа және жоғары. Нәтижесінде ең қатты тозған аймақтар ретінде Отырар, Арыс және Сауран аудандары тіркелді. Карталар ауылшаруашылық жерлерді қалпына келтіру және агроөнеркәсіптік жоспарлау үшін негіз бола алады.

Талқылау

Ғарыштық мониторинг технологиялары жер тозуының кеңістіктік сипатын дәл және тиімді анықтауға мүмкіндік берді. NDVI индекстері бойынша өсімдіктер жамылғысының уақыт өте азаюы климаттық және антропогендік факторлардың күрделі өзара әрекетін көрсетеді. Зерттеу көрсеткендей, ауылшаруашылық жүктеменің артуы, дұрыс жоспарланбаған суару және егіншілік айналымының бұзылуы тозудың негізгі себептерінің бірі болып отыр. Ғарыштық мониторингтің артықшылығы – деректердің тұрақты жаңарып тұруы, кең ауқымды қамтуы және өзгерістерді уақтылы тіркей алуы.

Қорытынды

Ғарыштық мониторинг пен ГАЖ технологияларын қолдану – ауылшаруашылық жерлердің деградациясын бағалаудың заманауи, тиімді жолы. Бұл тәсіл табиғи ресурстарды басқаруды ғылыми негіздеуге, деградация процестерінің алдын алу шараларын нақтылауға мүмкіндік береді. Зерттеу нәтижелері Түркістан облысы бойынша жер ресурстарын тиімді пайдалануға бағытталған нақты ұсыныстар дайындауға және болашақ мониторинг жүйесін жетілдіруге негіз болады.

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Medical Sciences

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ONCOLOGICAL SCREENING IN THE REPUBLIC OF KAZAKHSTAN: REALITIES, TRENDS, PROSPECTS

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Annotation: In this scientific and analytical work, the indicators of incidence and mortality from cervical cancer, breast cancer and colorectal cancer in the regions of our country are considered. The screening methods currently used and the results of this preventive survey of the population are described in detail. Detailed step-by-step algorithms are presented, and the principles of organization and diagnostic capabilities of the screening program for the active detection of these nosological forms of malignant neoplasms in clinically asymptomatic individuals are reflected.

Key words: cervical cancer, breast cancer, colorectal cancer, epidemiology, incidence, mortality, screening, Pap test, smear for oncocytology, ultrasound examination, mammography, hemocult test, fecal occult blood test - FOBT, total colonoscopy.

Today, one of the most important postulates of the oncology service continues to be the early diagnosis of malignant tumors. The purpose of screening is to identify asymptomatic (preclinical) cancer or precancerous conditions in an otherwise healthy target population. In this case, screening plays a leading role in secondary cancer prevention. The key concept of cancer screening is to identify pathology at a stage of development when the effectiveness of treatment is maximum and the prognosis is most favorable. When precancerous diseases are detected during screening, secondary prevention methods allow to prevent the transition of the initial pathological state to cancer. In this case, the main conditions for screening are the presence of trained personnel and a standard approach to identifying the trait being studied and evaluating the results. The methods used must be sufficiently simple, reliable and reproducible, as well as have sufficient sensitivity and high specificity [1-3].

Screening plays an important role in improving early diagnosis and treatment outcomes. According to the Guide to Cancer Early Diagnosis by Ilbawi A. et al. [4], screening aims to detect unrecognized cancer or its prior lesions in a typically healthy, asymptomatic population through tests or other procedures that can be applied quickly and are widely available to the target population. In screening, the target population is assessed for unrecognized cancer or precancer, and most people tested will not be diagnosed with the disease. Screening should be seen as a process and not as the performance of a specific test, examination, or procedure. The screening process includes a system of informing and inviting the target population to participate; administering the screening test; following-up with test results and referral for further testing among those with abnormal test results; ensuring timely pathologic diagnosis, staging and access to effective treatment with routine evaluation to improve the process. A screening program encompasses the process from invitation to treatment and requires planning, coordination and monitoring and evaluation.

To date, the republican oncological screening program includes three nosological forms of malignant neoplasms - cervical cancer (CC), breast cancer (BC), colorectal cancer (CRC). Let's consider the current epidemiological indicators, methodology and results of cancer screening in our country.

CC in the structure of all malignant tumors of both sexes of the population in 2022 took 6th place with a share of 5.51% (2021 - 4th place, 5.54%), in women - stable 2nd place - 9.7% (9.7%) [5].

The incidence rate per 100 thousand population increased from 9.4 to 9.92. In 10 regions of the republic, the incidence rate is higher than the national average: Pavlodar - 17.2 per 100 thousand people (2021 – 16.7) – the highest level, East Kazakhstan – 14.3 (10.8), North Kazakhstan – 14.3 (10.2), Atyrau – 13.2 (13.8), Zhetysu - 11.7, Karaganda - 11.7 (12.0), Abay - 11.1, Akmola - 11.1 (11.9), Mangistau - 11.1 (9.7), Kostanay - 10.8 (10.6) regions.

Low incidence rates in Zhambyl region - 5.8 per 100 thousand population (5.7), Turkestan region - 6.1 (5.2), Aktobe region - 8.3 (11.6), Kyzylorda region - 8.5 (8.2) areas.

CC in the structure of causes of death from malignant tumors of the population of both sexes in 2022 rose from 9th to 8th position, with a share of 4.6% (2021 - 4.3%), mortality from CC is stable at 3.1 per 100 thousand population (3.1).

The mortality rate from CC in 10 regions is higher than the national average: Akmola - 4.2 per 100 thousand population (2021 - 3.1) - maximum level, West Kazakhstan - 4.1 (4.8), Pavlodar - 3.8 (5.6), Almaty – 3.7 (2.5), Zhetysu – 3.7, Atyrau – 3.4 (4.0), East Kazakhstan – 3.3 (3.8), Karaganda - 3.2 (4.7), Kostanay - 3.2 (2.4) regions and Almaty city - 3.4 (2.9).

Below the national average, mortality was recorded in Abay region, cities Astana, Shymkent - 2.9 per 100 thousand population, Mangistau - 2.8 (3.0), Turkestan - 2.3 (2.2), Aktobe - 2.2 (3.0), North - Kazakhstan - 2.0 (2.6), Kyzylorda regions - 1.7 (3.5) - the best result [5].

In 12 regions, a 100% level of morphological verification of the diagnosis was ensured, the lowest or worst indicator for the third year was in the Kyzylorda region - 94.3%, below the national average indicators in Akmola - 98.8%, Atyrau - 98.9%, Kostanay - 98, 9%, Mangistau - 97.6%, Pavlodar - 96.6%, regions and Almaty city - 98.5%;

In a number of regions, the frequency of diagnosis of stage I-II CC was below the national average (88.1%) - in Akmola - 76.2% (2021 - 73.6%) - the worst result in the country, in Karaganda - 77, 2%, Zhetysu - 82.9%, Abay - 83.8%, Kostanay - 84.3%, Aktobe - 85.5%, West Kazakhstan -

85.7%, Pavlodar - 81.3%, while that in the Atyrau region - 100.0% result.

The proportion of stage IV CC is higher than the national average (2.7%) in the following regions: the worst result is in Zhetysu (6.1%), above the national average in Karaganda - 5.1% (2021 - 5.6%), Akmola - 4.8% (2.3%), Kostanay - 4.5% (4.4%), North Kazakhstan - 3.9% (7.4%), Almaty - 3.7 % (5.1%), Zhambyl - 2.9% (0.0) regions, cities Almaty – 3.6% (1.8%) and Shymkent – 3.8% (5.9%). The lowest neglect is in the East Kazakhstan region - 1.0% (0.7%).

Late diagnosis rates (III-IV stages) for CC are above the national average - 11.9% (15.4% in 2021) were noted in Akmola - 23.8% (2021 - 26.4%) - worst result, Karaganda - 22.8% (35.2%), Pavlodar - 18.8% (20.8%), Zhetysu - 17.1% (24.2%), Abay - 16.2% (12.8%), Kostanay - 14.6% (15.6%), Aktobe - 14.5% (9.6%), West Kazakhstan - 14.3% (32.4%) regions. The lowest neglect is in the Mangistau region - 6.0% (20.8%).

Across the country, the five-year survival rate of patients with CC registered in 2018 was 59.9% in 2022, with a decrease from the level of 2021 (67.5% for those registered in 2017), and with a significant range in by region, from the maximum – 72.9% (2021 – 70.7%) in the North Kazakhstan region, to the minimum – 34.9% (64.4%) in the Atyrau region [5].

CC screening is a periodic, comprehensive examination of women of a certain age group as part of a special medical program to prevent and reduce incidence and mortality from CC.

Type of screening - population. The purpose of screening is to identify pre-invasive diseases of the cervix with subsequent recovery. The screening method is a cytological examination of a smear for oncocytology from the cervix (traditional and liquid cytology). Coloring according to the "Papanicolaou test" (Pap test). Interval - 1 time in 4 years. Target group: women aged 30-70 years who are not registered in the dispensary for CC. The expected results are a decrease in incidence and mortality from CC.

Screening steps:

1) Preparatory - formation of target groups, information support and invitation to screening. The preparatory stage is carried out by the nurses of the primary health care organization responsible for preventive measures and includes: annual compilation of a list of women subject to screening in the coming year by November 15 of the current year, followed by monthly correction; informing target groups of the female population about the need for screening; screening invitation; ensure timely screening.

2) Screening - filling out a statistical card of a preventive medical examination (screening) of an outpatient (form 025-08/y), a register of patients subject to cytological screening and taking material for cytological examination from the cervix. The screening examination of the target groups of the female population is carried out by a specially trained midwife of the primary health care organization.

3) The final one is obtaining the results of cytology, informing the woman and developing further management tactics, fill out accounting and reporting statistical documentation. Responsible for the final stage of screening is the obstetrician-gynecologist of primary health care [6].

Cytological screening of CC is a complex of organizational and medical measures aimed at early detection of precancerous and neoplastic diseases of this localization and at reducing the mortality of this cohort of patients. For traditional cytology, a smear containing 8-12 thousand cells of stratified squamous epithelium (including cells of metaplastic epithelium) is considered adequate; for liquid cytology - 5 thousand cells. For both methods, the number of cells of endocervical epithelium and/or metaplastic epithelium (from the transformation zone) must be at least 10 (single or in clusters). If more than 75% of the cells of the stratified squamous epithelium are covered with erythrocytes, leukocytes, etc., then the quality of the smear is considered unsatisfactory.

Interpretation of the results of a cytological study is carried out according to the Bethesda-terminology cytological system:

Intraepithelial changes and malignant processes are absent (NILM). This group includes cytological conclusions about the normal state of the epithelium, as well as the presence of various non-neoplastic diseases. Normally, squamous epithelial cells, groups of cells of columnar epithelium and metaplastic epithelium, a small number of leukocytes, and rod/mixed microflora are found in preparations. In the presence of non-neoplastic processes, their nature and, if possible, the cause are specified: atrophic changes, reactive changes associated with inflammation, including typical regeneration. In addition, the presence of microorganisms is indicated: Trichomonas vaginalis, fungi, morphologically corresponding to Candida spp., bacterial vaginosis, cellular changes corresponding to the defeat of Herpes simplex virus, squamous epithelial cells with atypia of unknown significance (ASC-US), squamous epithelial cells with atypia of unclear significance, not excluding the presence of a high degree of intraepithelial changes (ASC-H). Low-grade squamous intraepithelial changes (LSIL) include lesions associated with HPV and CINI, high-grade squamous intraepithelial changes (HSIL) include CINII, CINIII, carcinoma in situ and cases suspected of invasion, squamous cell carcinoma, cervical (glandular) epithelium with atypia of unknown significance, cells of the cervical (glandular) epithelium, possibly neoplasia, endocervical adenocarcinoma in situ, endocervical adenocarcinoma, endometrial adenocarcinoma, secondary adenocarcinoma, unclassified carcinoma, other malignant tumors.

There are certain features when taking material for oncocytology: firstly, the examined woman should be informed about the exclusion of sexual intercourse, vaginal manipulations, including douching, baths, tampons, etc. 2 days prior to sampling. Taking material for cytological examination is carried out by the midwife of the examination room of the department of medical examinations of the primary health care organization: the traditional method (2 glasses - with obligatory fixation in 96% alcohol, it is preferable to use glass slides with a polished edge, which are easily marked) or the liquid cytology method (one container with stabilizing liquid); the code or surname of the patient, identical to the code and surname in the form for sending material for cytological examination, should be clearly marked on the glasses or container [6].

At the same time, when using the traditional method, the biomaterial is delivered to the cytological laboratory as soon as possible after its collection in specialized containers for glass slides with 96% alcohol. If there are visible visual changes in the cervix, then the material is taken from the woman and, without waiting for the results, she is referred for an examination by an obstetrician-gynecologist.

A cytological study is carried out in centralized cytological laboratories at oncological institutions, where an archive of cytological preparations of patients involved in the screening examination is formed, regardless of the result, for a period of at least 10 years with the formation of a computer database.

What material and technical equipment is required to take material for a Pap test? It is as follows: soap and water for washing hands, a light source for cervical examination, a gynecological chair, a disinfected speculum and gloves, an Eyre spatula, a glass slide and a marking pen, a container with a stabilizing solution for liquid cytology, a fixative solution (96% alcohol), a container with warm water for lubricating and warming the vaginal mirrors, a 0.5% chlorine solution for disinfecting gloves and instruments, or another approved for this purpose. And, of course, the registration form itself.

For carrying out liquid cytology, you additionally need: a disposable cervix brush, a container with a stabilizing solution for liquid cytology, and a fixing solution.

At the same time, a smear for oncocytology cannot be taken: during menstruation, earlier than 48 hours after sexual contact or after using lubricants, vinegar or Lugol solution, tampons or spermicides, after vaginal examination or douching, and also during the treatment of genital infection.

Now, regarding the results of CC screening. In 2022, 771,282 women of the target group aged 30 to 70 years were examined during cytological screening (in 2021 - 757,454).

During cytological screening in 2022, 392 cases of cervical cancer were identified (319 in 2021). The detection rate increased from 0.42 to 0.51 per 1000 women examined

High detection of CC during screening is ensured in Aktobe, Almaty, Atyrau, East Kazakhstan, Kyzylorda, Pavlodar, North Kazakhstan, Turkestan regions and Shymkent city. The detection rate in these regions ranges from 0.55 to 1.59 per 1000 women examined. The best indicator is in Atyrau region - 1.59. Compared to 2021, there is an increase in detection in 10 regions, with the exception of Akmola, Aktobe, Zhambyl, Kostanay, Mangistau, North Kazakhstan regions and Shymkent city. The worst result in Astana is 0.15 per 1000 women examined [5].

Cytologically, cervical precancer was detected in 1.16% of those examined (2021 – 0.99%). The detection rate of precancer below 0.6% (the planned indicator for 2022, according to the Comprehensive Plan) was noted in Aktobe, Karaganda and Kostanay regions.

A high proportion of stage I CC (70% or more) was detected in 6 regions of the country (in 8 in 2021): Kostanay, Mangistau (94.7% - best result), North Kazakhstan, Turkestan regions, cities Almaty and Astana. Low levels of early detection of CC (below 50%) were not observed in any region.

Localized processes (stages I-II) were identified in 99.2% of all cases of detected cancer (96.5%). In the Akmola and Karaganda regions, cases of CC were identified not only in localized, but also in widespread stages of the process. A total of 3 cases of CC in stage III and no cases in stage IV were identified (11 and 0, respectively) [5].

BC ranks first in the structure of the frequency of malignant tumors of both sexes in the population with a share of 14.7% (2021 - 15.4%). This situation has been stable since 2004; in addition, BC ranks first and remains consistently in this position in the structure of female oncopathology. The incidence of BC in 2022 in the country as a whole increased to 26.5 per 100 thousand (2021 – 26.3). In the structure of cases, BC occupies the 1st ranking place in the vast majority of regions and cities of the country, except for three: Akmola, Kyzylorda and North Kazakhstan regions, where lung cancer takes the 1st ranking place [4].

Above the national average - 26.5 per 100 thousand of us. – incidence of BC in 10 regions of the country: Abay – 33.3, Akmola – 32.7 (2021 – 29.8), East Kazakhstan – 44.7 (39.9) – the highest level, West Kazakhstan – 31.2 (28.4), Karaganda – 40.2 (40.1), Kostanay – 37.5 (35.8), Pavlodar – 43.2 (47.4), North Kazakhstan – 34.7 (38.2) regions and Almaty city – 35.4 (34.5), Astana city – 31.5 (28.4). Below average indicators per 100 thousand of us. in Aktobe - 21.6 (24.3), Almaty - 21.9 (17.7), Atyrau - 22.8 (15.7), Zhambyl - 14.2 (15.1), Zhetysu - 22.8, Kyzylorda - 14.6 (14.4), Mangistau - 14.7 (17.3), Turkestan - 11.3 (11.7) regions and Shymkent city - 14.9 (21.9) [5].

BC ranks third in the structure of causes of death from malignant tumors in the population of both sexes for the thirteenth year in a row, amounting to 8.1% in 2022 (2021 – 8.7%). In the republic as a whole, mortality from BC decreased by 13.0%, from 6.2 to 5.4 per 100 thousand people.

The regions where mortality from BC is higher than the national average include: Abay - 10.1 per 100 thousand people (maximum level), East Kazakhstan - 8.0 (2021 - 8.5), Pavlodar - 7.1 (10.0), North Kazakhstan - 7.0 (11.4), Kostanay - 6.9 (7.5), Akmola - 6.5 (8.2), West Kazakhstan - 5.7 (6.9), Zhambyl - 5.5 (4.8) and Astana city – 6.3 (6.6), Almaty city – 6.6 (9.5). The indicators are significantly lower in Aktobe - 4.5 (3.5), Almaty - 4.5 (5.8), Zhetysu - 4.0, Atyrau - 3.7 (3.0), Kyzylorda - 4.4 (4.1), Turkestan - 3.6 (3.6), Mangystau regions - 2.7 (3.6) - the lowest level [5].

Mass screening to identify BC patients should mainly involve healthy women without any signs of the disease or symptoms. Screening not only helps to detect hidden forms of cancer that can be treated, but also has psychological value for women. As a result of screening, women are convinced that they do not have BC, and this is the most important potential success of such programs. While the ultimate goal of screening is to reduce BC mortality, its immediate goal is to detect cancer before clinical manifestation. However, BC is a heterogeneous disease, which can significantly affect the effectiveness of screening. Screening models for BC are usually based on the fact that the majority of detected tumors are invasive cancers in the early stage of progression. In addition, it must be taken into account that the detection of cancer (or its precursors) before clinical manifestation increases the risk of false positive diagnosis [7,8].

Mammography has a sensitivity of 95% and a specificity of 97%. These indicators decrease when examining women with denser mammary glands (young age, use of hormone therapy), with low quality mammography, and also with insufficient qualifications of the radiologist. Detection of high-grade invasive cancer by screening, when the tumor is not yet detected by clinical examination (palpation), means the possibility of reducing mortality from BC [9].

Preventive screening for early detection of BC in the Republic of Kazakhstan includes [10]:

1) mammography of both mammary glands in two projections - direct and oblique in the mammography room of the city, district polyclinic (mobile medical complex). All digital mammograms in the presence of a system for archiving and transferring medical images are copied to CDs and other electronic media and transferred to the server of the mammography room of the Cancer Center using specialized licensed software integrated between medical organizations; in case of impossibility of digital transmission - they are printed on X-ray film at a scale of 1:1 - 100% (1 patient - 1 set - 2 or 4 mammograms) with subsequent transfer to the mammography room of the Cancer Center;

2) interpretation of mammograms according to the BI-RADS classification (M0t, M0d, M1, M2, M3, M4, M5) by two or more independent radiologists of the same medical organization - double reading or different medical organizations: a radiologist of the mammography room city, district polyclinic (mobile medical complex) - the first reading, and the radiologist of the mammography room of the Cancer Center - the second reading;

3) in-depth diagnostics - targeted mammography, ultrasound examination (hereinafter - ultrasound) of the mammary glands, trepanobiopsy, including under ultrasound or stereotaxic control for histological examination, which is carried out in case of detection of pathological changes on mammograms (M0d) in the mammography room of the Cancer Center.

√ An average medical worker or a responsible person of the organization of outpatient care sends the patient for mammography to the district, city polyclinic.

√ The X-ray laboratory assistant of the mammography room of the city, district polyclinic (mobile medical complex) performs mammography, fills out a referral for double reading of mammograms and transmits the referral through information interaction.

Radiologist of the mammography office of the city, district polyclinic (mobile medical complex): fulfills the requirements for the safety and quality of mammographic examinations; evaluates the quality of the images provided and the correctness of the installation; performs repeated mammography in the M0t category (technical errors of mammography); determines the radiological density of the mammary glands on the ACR scale (A, B, C, D) indicating this parameter in the study protocol; conducts the first reading of mammograms with interpretation of the BI-RADS classification results. In the M0d category (undetermined or suspicious radiological changes requiring additional examination), the study protocol indicates the predominant pathology: education, asymmetry, violation of architectonics, microcalcifications; sends mammograms, electronic copies of mammograms through the archiving system and transfer of medical images to the workplace of the mammography office of the Cancer Center together with directions for double reading of mammograms; directs low–dose computed tomographic images through the system of archiving and transferring medical images to the workplace of the computer tomography office of the Cancer Center together with copies of images recorded on CD-ROMs or other electronic media and directions for double reading.

◆ The radiologist of the mammography room of the Cancer Center: evaluates the quality of the provided images and the correctness of the styling. Viewing digital x-ray images transferred to the server or on digital media (CD, DVD) is carried out on a monitor for interpreting digital x-ray images with a resolution of at least 5 megapixels, which has a certified grayscale transmission in accordance with the DICOM standard; conducts a double (second) reading of mammograms with the interpretation of the results according to the BI-RADS classification, using, if necessary, archival images. Organizes the third reading according to indications. With double reading, an independent interpretation of the images is carried out (blinding method - the second radiologist does not know the results of the first reading); in the M0m category (technical errors in mammography), recommends repeat mammography; in the M0d category (uncertain or suspicious radiographic changes requiring additional examination), the study protocol indicates the predominant pathology: education; asymmetry, violation of architectonics, microcalcifications; recommends that the outpatient care organization, according to indications, invite the patient for in-depth diagnostics (targeted mammography, ultrasound of the mammary glands, trephine biopsy, including under ultrasound or stereotaxic control, followed by histological examination of the material); collects and archives all mammograms (films and electronic media) made as part of the examination. The shelf life of mammograms is at least 3 years after leaving the age subject to a screening study; the results of the double (second) reading are transferred to the outpatient care organizations through information exchange.

◆ Indications for in-depth diagnostics are the conclusions of double reading mammograms M0d (uncertain or suspicious X-ray changes requiring additional examination).

◆ In-depth diagnostics is carried out in two stages. At the first stage, ultrasound is performed, according to indications, targeted mammography, possibly with an increase (with asymmetry, violation of architectonics and the presence of microcalcifications). When visualizing a suspicious pathology (M4 and M5), the second stage is performed - trepanbiopsy, including under ultrasound control and stereotaxic control for histological examination.

◆ Histological examination is carried out in the laboratory of pathomorphology or pathological bureau. Morphological interpretation of the biopsy is carried out in accordance with the recommendations of the World Health Organization.

◆ Physician or responsible person of the outpatient care organization:

1) upon receipt of a mammography result according to the BI-RADS classification:

- in case of M0t (technical errors in mammography) - sends the patient for a second X-ray examination to the mammography room of the city, district polyclinic (mobile medical complex);

- with M0d (undefined or suspicious X-ray changes requiring additional examination) - sends the patient for in-depth diagnostics to the mammography room of the Cancer Center;

- with M1 (no changes detected) - recommends that the patient undergo a follow-up mammography examination after 2 years. With radiological density of the mammary glands, C and D are sent for ultrasound of the mammary glands to exclude a false-negative result of mammography;

- with M2 (benign changes), refer the patient for a consultation with an oncologist (mammologist) of the clinical diagnostic department, followed by a screening mammography examination after 2 years;

- with M3 (probable benign changes) - sends the patient for short-term dynamic radiation observation to the local doctor with the recommendation of control mammography or ultrasound in 6 months;

- with M4 (signs that cause suspicion of malignancy), M5 (practically reliable signs of malignancy) and if it is technically impossible to perform a trepanbiopsy or a biopsy is refused, a referral to an oncologist (mammologist) of the clinical diagnostic department for dynamic observation and decision on the verification of the identified pathology;

2) upon receipt of the result of a histological examination:

- benign education - refers the patient to an oncologist (mammologist) of the clinical diagnostic department for dynamic monitoring, followed by a screening mammography examination after 2 years;

- formation with an indeterminate malignant potential or carcinoma in situ - refers the patient to the Cancer Center for consultation and treatment, followed by dynamic observation by an oncologist (mammologist) of the clinical diagnostic department at the place of her attachment;

- malignant neoplasm - refers the patient to the Cancer Center for treatment and follow-up;

3) communicates the results of the screening examination to the patient in any available way (by telephone, in writing, through electronic means of communication);

4) enters the results of double reading, in-depth diagnostics, histological examination, recommendations of the radiologist of the Cancer Center mammography room into the information system.

Establishing the size of the primary tumor is especially important in screening. Tumor size is an important criterion for evaluating the quality of screening and determining the ability of X-ray mammography to detect non-palpable tumors. Therefore, it is extremely important that pathologists measure tumor diameter as accurately as possible. The smaller the size of the primary tumor, the greater the likelihood of error in determining its size.

Let's analyze the results of BC screening. Mammography screening identified 1,570 cases of BC in 2022 (1,402 in 2021). The cancer detection rate increased from 1.78 to 1.94 per 1000 examined. The best result is in the Karaganda region – 2.63 per 1000 women examined. Low detection rate per 1000 examined, compared to the republican average, in Atyrau (1.72), Zhambyl (0.58), Kyzylorda (1.68), Mangistau (0.42 - worst result), Turkestan (1.22) regions and cities Astana (1.5) and Shymkent (1.58). Compared to 2021, there was an increase in the detection of BC in 9 regions, with the exception of Aktobe (decrease from 2.87 to 2.19 per 1000 women examined), Karaganda (from 2.73 to 2.63), Mangistau (from 1.10 to 0.42), North Kazakhstan (from 3.27 to 2.31), Turkestan (from 1.36 to 1.22) regions and cities Astana (from 1.54 to 1.50), Almaty (from 2.24 to 2.18) and Shymkent (from 2.35 to 1.58) [5].

In 2022, the proportion of patients identified during screening studies with early stages of BC (stage 0-I) was 50.2% during screening (in 2021 - 47.9%). A high proportion of stages 0-I BC (over 50%) was recorded in 8 regions (in 8 in 2021): Akmola, West Kazakhstan, Karaganda (70.8% - best result), Pavlodar, North Kazakhstan, Turkestan regions, cities Astana and Shymkent. Low levels of early detection of BC (below 40%) were noted in Aktobe (19.3% - worst result), Zhambyl (34.8%), Kostanay (39.5%), Mangistau (27.3%) regions and Almaty city (37.3%). Localized cancer (0-I and II stages) amounted to 96.2% (2021 - 95.5%), while not a single case was detected in stages III-IV in Atyrau, West Kazakhstan, Zhambyl, Kyzylorda, Mangistau, Pavlodar regions, cities Astana and Shymkent. A total of 46 cases of breast cancer in stage III and 14 in stage IV were identified (52 and 11, respectively) [5].

Epidemiological indicators of CRC in the form of colon cancer and colorectal cancer are considered separately for objective reasons.

Colon cancer with a specific gravity of 5.53% (2021 - 5.2%) in the structure of oncopathology of both sexes of the population has risen to 5th place, in men it remains in 6th place - 5.8% (5.5 %), for women - in the 5th - 5.3% (4.91%) The incidence rate of cancer of this localization in the country in the reporting year increased from 8.8 to 9.95 per 100 thousand population.

The incidence of colon cancer in 10 regions is higher than the national average - 9.95 per 100 thousand population: Kostanay - 20.7 (2021 - 15.9), Pavlodar - 18.8 (15.3), North Kazakhstan

- 18, 0 (12.7), East Kazakhstan - 16.9 (13.4), Karaganda - 15.4 (15.0), Akmola - 14.6 (10.2), West Kazakhstan - 11.0 (10.1), Abay - 10.0 (9.0) regions and cities Almaty – 12.8 (12.1) and Astana – 10.5 (9.0). As in 2021, colon cancer was detected much less frequently in Turkestan - 3.1 per 100 thousand population (2.7), Kyzylorda - 4.1 (4.6), Zhambyl - 5.5 (5.8), Almaty - 6.3 (4.7), Zhetysu - 6.4, Mangistau - 6.8 (4.9) regions and Shymkent city - 5.0 (4.0) [5].

Rectal cancer in the structure of malignant neoplasms of both sexes retains 7th place in rank with a specific gravity of 4.9% (2021 - 4.92%), but in men it dropped from 4th to 5th place - 6.1%, for women – from 9th to 10th – 4.0%. The incidence rate per 100 thousand population increased from 8.4 to 8.8.

A high incidence rate was recorded in Kostanay - 17.8 per 100 thousand population (2021 - 16.2), East Kazakhstan - 17.7 (13.9), North Kazakhstan - 15.6 (15.1), Pavlodar – 14.9 (18.1), Karaganda – 13.3 (11.7), Abay – 12.9, West Kazakhstan – 12.9 (9.8), Akmola – 10.3 (13.1) regions and Astana city – 10.3 (9.0). Traditionally, a low incidence of rectal cancer is observed in Mangistau - 3.1 (2.8), Turkestan - 3.3 per 100 thousand population (2.7), Zhambyl - 3.7 (5.1), Kyzylorda - 4, 1 (5.3), Almaty – 5.3 (5.6) regions and in Shymkent city – 5.5 (5.0) [5].

Rectal cancer in the structure of causes of death from malignant neoplasms of the population of both sexes in 2022 remained in 5th place with a share of 5.41% (2021 – 5.41%). In the republic as a whole, the mortality rate from this form of cancer was 3.6 per 100 thousand population (3.87).

The mortality rate per 100 thousand population was higher than the national average in East Kazakhstan - 7.8 (2021 - 8.6) - the maximum level, Pavlodar - 7.5 (7.6), Abay - 5.9, North Kazakhstan - 5.8 (4.3), Kostanay - 4.9 (4.9), West Kazakhstan - 4.8 (4.2), Karaganda - 3.8 (5.2) regions. Below the national average - 3.8 per 100 thousand population, mortality in Aktobe - 3.2 (4.1), Almaty - 2.6 (2.6), Atyrau - 2.5 (3.4), Zhetysu - 2, 6, Zhambyl - 3.3 (2.7), Turkestan - 2.1 (1.6), Mangistau - 1.9 (1.2), Kyzylorda regions - 1.8 (2.1) - the lowest figure , and cities Almaty – 3.7 (4.3), Shymkent – 2.6 (2.1).

Colon cancer in the structure of causes of death from malignant neoplasms of the population of both sexes in 2022, as in 2021, ranks 6th, with a share of 5.2% (2021 – 5.0%). At the same time, the mortality rate in the country decreased by 5.6%, from 3.6 to 3.4 per 100 thousand population.

Mortality rates in 10 regions are higher than the national average: East Kazakhstan - 7.1 per 100 thousand population (2021 - 5.1) - maximum level, Pavlodar - 5.6 (6.0), Kostanay - 5.3 (5.6), Akmola – 5.2 (3.8), Abay – 5.1, Karaganda – 5.1 (5.6), West Kazakhstan – 4.8 (4.4), North Kazakhstan – 4.8 (5.0) regions and cities Astana – 3.6 (2.7), Almaty – 4.5 (5.3). Low mortality rates from colon cancer were noted in Kyzylorda - 1.2 per 100 thousand population (2.7) - the best result, Turkestan - 1.3 (1.7), Mangistau - 1.6 (2.6), Aktobe – 2.0 (2.5), Zhetysu – 2.4, Zhambyl – 2.5 (3.7), Atyrau – 2.5 (1.8), Almaty – 2.6 (1.8) regions and cities Astana – (2.7), Shymkent – (2.4).

For colon cancer (94.0%) - 100% verification level was achieved in 3 regions (Abay, Almaty and Turkestan regions), high rates in the Astana city (98.5%), Shymkent city (98.0%), Zhambyl (98.4%), Atyrau (98.2%) regions, low – in Akmola region (86.7%), Almaty city (84.3%), in the Kyzylorda region (61.8%) – the worst result since 2017.

For rectal cancer (97.4%) - in 6 regions there is a 100% verification level, the worst level is still in the Kyzylorda region - 85.3%, lower than the republican average in the Akmola region - 92.6%, Aktobe region - 96 .8%, Mangystau region - 87.0%, Pavlodar region - 95.3%, Almaty city - 93.2% [5].

The frequency of diagnosis of stage I-II rectal cancer, as a visually accessible localization (68.9% - national average) in the regions, was: in Akmola - 34.6% - the worst result, as in 2021, in the country (2021 - 44.1%), Mangistau - 47.8%, Abay - 53.9%, West Kazakhstan - 59.1%, Almaty - 66.2%, Zhetysu - 68.6%, Karaganda - 65, 7% regions and Shymkent city - 62.9%.

For colon cancer (52.4%), early diagnosis rates are higher in Pavlodar (65.9% - best result), Abay, Aktobe, Atyrau, East Kazakhstan, Zhambyl, Zhetysu, Karaganda, Kostanay, Pavlodar, North Kazakhstan, Turkestan regions and Shymkent. The lowest figure (23.5%) is in the Kyzylorda region.

For colon cancer (17.3%), the rates of neglect at stage IV are higher - in Akmola - 31.0% - the worst result (2021 - 20.3%), Zhetysu - 27.3%, Abay - 23.1% , Turkestan - 22.2% (29.1%), Karaganda - 28.1% (28.6%), West Kazakhstan - 18.8% (8.2%), Mangistau - 17.6% (19 .4%) regions and cities Astana - 18.0% (22.9%), Shymkent - 20.0% (22.7%). The lowest level of neglect is 2.9% in the Kyzylorda region (7.9%).

The proportion of stage IV in rectal cancer (13.1%) is higher in Akmola - 29.6% - the worst result (2021 - 19.4%), Abay - 19.7%, Kyzylorda - 17.6% (9.1%), Karaganda - 16.9% (28.4%), Almaty - 15.6% (17.0%), Kostanay - 14.8% (11.1%), Zhambyl - 13.3 % (13.6%) regions and Shymkent city - 14.5% (12.5%). The lowest level of neglect - 6.0% - is in the Atyrau region (12.5%).

Late diagnosis of rectal cancer as a visually accessible localization (stages III-IV) in 2022 amounted to 31.1% (in 2021 - 33.5%).

For rectal cancer, the level of neglect is higher than the national average - 31.1%, the indicators in Akmola - 65.4% (2021 - 55.9%) - the worst result in the country, Mangistau - 52.2% (38.1%), Abay – 46.1% (30.6%), West Kazakhstan – 40.9% (25.4%), Karaganda – 34.3% (46.5%), Almaty – 33.8% (35.7 %), Zhetysu - 31.4% (34.1%) regions and Shymkent city - 37.1% (42.9%). The lowest neglect is in the Atyrau region - 12.0% (17.5%).

In the country as a whole in 2022, the five-year survival rate of patients with CRC registered in 2018 decreased to 40.4% (2021 - 52.9% for those registered in 2017); there is a significant dispersion of indicators by region, from maximum – 56.1% (47.5%) in the Kyzylorda region, to minimum – 24.3% (51.5%) in the Aktobe region [5].

Screening of CRC screening is the systematic use of screening studies in an asymptomatic population. The purpose of screening is to identify people with abnormalities suggestive of CRC. These persons in the future need additional examination to clarify the diagnosis. Opportunistic screening is the non-systematic use of screening tests in routine medical practice. A screening program is much more challenging than an early detection program. At the same time, the success of the screening program is largely determined by the awareness of the population and medical workers about the possibilities of early diagnosis of CRC. The feasibility of a screening program is determined by several factors that relate to the disease being screened, the screening test, the characteristics of the population, and the characteristics of the healthcare system.

The first factor is that the disease must be well understood, common enough in the target population to justify screening, have a recognizable early stage; treatment of the disease at an early stage should be more effective than at a later stage.

The second is that the test should be characterized by sufficient sensitivity, i.e. the ability to detect cancer among people with the disease; sufficient specificity - the probability that among people who do not have a disease, the test result will be negative; have a high positive predictive value (positive predictive value) or, in other words, the likelihood that people with a positive test result have the disease; have a high predictive value of a negative result (negative predictive value), i.e. the likelihood that people with a negative test result do not have the disease; security; low cost; and acceptability - the likelihood that people for whom this test is intended will agree to the examination (which to some extent depends on the awareness of the population about the possibilities and importance of early diagnosis).

The third factor is that the healthcare system should be ready for maximum screening test coverage of the target group, have the resources to confirm the diagnosis, appropriate treatment and follow-up of people with positive test results, and regularly conduct screening tests at regular intervals. At the same time, the benefits of screening must outweigh the potential physical and psychological harm and justify the financial costs of its implementation [11].

The factors most significant for the development of CRC are:

- the presence of chronic inflammatory bowel diseases, adenomatous polyps, cancer of other localization, etc.;

- family history (presence of one or two first-degree relatives with CRC or familial diffuse intestinal polyposis);

- the age of men and women over 50 years old, taking into account the fact that more than 90% of patients with colorectal cancer are people of this age (medium risk).

Age, regardless of gender, is an important risk factor for CRC. After the age of 50, the incidence of CRC increases from 8 to 160 per 100,000 population. Thus, people who have reached the age of 50, even in the absence of symptoms, constitute a moderate risk group for CRC.

The second category of increased risk of CRC (20%) is made up of persons with a genetic and family predisposition, suffering from chronic inflammatory bowel diseases, diffuse familial polyposis.

The high-risk CRC group is determined by the so-called Amsterdam criteria (the presence of malignant tumors in two generations, the presence of cancer in a first-line relative under the age of 50 years), in this case, CRC screening should be carried out after the age of 30 years [12].

The degree of individual risk of developing CRC is determined before screening to select the scope of studies and the frequency of their conduct.

The interval for oncological colorectal screening is 1 time in 2 years, target group: men and women aged 50-70 years, with the exception of persons registered at the dispensary for CRC and colon polyposis. At the same time, when forming the target group, one should take into account the absence of severe concomitant diseases, such as the presence of a common malignant neoplasm, cerebrovascular diseases in the stage of decompensation, chronic obstructive pulmonary disease with respiratory failure, cirrhosis of the liver, myocardial infarction with congestive heart failure, diabetes mellitus with vascular complications. and others, which are highly likely to lead to death in the next 10 years.

The first step in screening for CRC is the fecal occult blood test (FOBT). Traditionally, such methods include a benzidine test for occult blood in the feces. This is a biochemical method based on the assessment of pseudoperoxidase activity of hemoglobin. There is ample evidence that invitation to guaiac FOBT screening (gFOBT) reduces CRC mortality by approximately 15% in age-matched average-risk populations.

To ensure the effectiveness of screening with gFOBT, the interval for screening under the national screening program should not exceed two years. To date, there is an immunochemical FOBT method - iFOBT, which is superior in efficiency to gFOBT in terms of the probability of detecting adenoma and cancer. iFOBT has improved analysis performance compared to gFOBT.

Immunochemical (immunochromatographic) examination of feces for occult blood - iFOBT or hemocult test is carried out for all men and women of the target group using an express method, which allows you to get a result within 3-5 minutes, without the participation of a medical worker. However, the evaluation of the test is carried out only by a medical worker in the PHC preventive department.

With a positive analysis of feces for occult blood, the second stage of colorectal screening is performed, which consists in endoscopic examination of the colon - total colonoscopy [6]. At the same time, in this case, this medical manipulation is of a therapeutic and diagnostic nature, since it allows one-stage removal of adenomatous polyps, which, according to various authors, occur in every third subject after 50 years of age. At the same time, women have 20% fewer polyps than men, but they have more right-sided lesions, which are more difficult to detect using fecal blood tests, because they are less traumatic [13,14].

What results were obtained from screening for CRC? In 2022, 937,859 men and women of the target group aged 50 to 70 years were examined during colorectal screening (in 2021 -

920,640) [5].

Colorectal screening revealed 325 cases of colorectal cancer in the reporting year, which is 114 cases more than in the previous year (211 cases). The detection rate increased from 0.23 to 0.35 per 1000 patients examined. Low detection of colorectal cancer was noted in Zhambyl, Karaganda, Kostanay, Kyzylorda, Mangistau, Turkestan - the worst result, East Kazakhstan regions, Astana city - from 0.07 to 0.30 per 1000 examined. The best result is in the North Kazakhstan region – 0.81 per 1000 examined. Compared to 2021, there was a decrease in the detection of colorectal cancer per 1000 people examined during screening in Karaganda (from 0.22 to 0.21), Kostanay (from 0.29 to 0.28), Mangistau (from 0.20 to 0.12) regions and Astana city (from 0.20 to 0.19).

Colon precancer (adenoma detection rate) was detected in 27.5% of patients who underwent colonoscopy (2021 – 22.8%). The detection rate of precancer in Akmola, Aktobe, Almaty (8.5% is the worst result), West Kazakhstan, Zhambyl, Kostanay, Kyzylorda, Mangistau, Pavlodar, North Kazakhstan, Turkestan regions and cities is lower than the national average Astana and Shymkent. The best result is 36.2% in Almaty city. It should be noted that the planned indicator for the detection of precancer of the colon and rectum in the country for 2022, according to the Comprehensive Plan, was 23.0% and was achieved.

In 2022, the proportion of patients identified during screening studies with early stages of malignant neoplasms (stages 0-I) was 26.2% during colorectal screening (in 2021 - 27.5%).

High early detection of colorectal cancer (above 30%) was noted in Akmola, West Kazakhstan, Karaganda, Kostanay, Kyzylorda, Turkestan regions and Astana city (57.1% - the best result). Not a single case of early cancer has been identified in the Mangistau region. Cases of cancer in stages III-IV detected during screening were registered in Akmola, Aktobe, Almaty, West Kazakhstan, Zhambyl, Karaganda, Kostanay, Mangistau regions and Almaty city. A total of 21 cases of colorectal cancer in stage III and 3 in stage IV were identified (in 2021 - 18 and 5, respectively) [5].

The complex analysis carried out allows us to conclude that satisfactory results of cancer screening can be achieved only with its proper organization, high quality of implementation, active participation in population screening, the use of highly sensitive tests and instrumental methods of preventive examination, as well as subsequent accurate diagnosis of identified tumors and timely treatment. High-quality screening leads to early diagnosis of pedological diseases and malignant pathology in the early stages, which, in turn, increases the effectiveness of treatment and improves the prognosis of the disease. Target groups that, for one reason or another, do not participate in screening should be informed that there are no other methods other than screening that would reduce mortality from malignant neoplasms. Incidence and mortality rates from cervical cancer, breast cancer and colorectal cancer clearly reflect the epidemiological situation with this pathology in the regions of our country.

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LARYNGEAL CANCER: TOPICAL ISSUES AND THEIR SOLUTIONS

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Annotation: this scientific and analytical work presents modern world and local-regional data on incidence, mortality, lethality and five-year survival rate of such oncological pathology of head and neck tumors as laryngeal cancer. The issues of etiology and pathogenesis, features of distribution, modern approaches and principles of complex diagnostics, prospects for improving treatment results, as well as prognosis are covered in detail. The epidemiological characteristics of this pathology in our republic are given in the context of regions of the country.

Key words: oncology, otorhinolaryngology, laryngeal cancer, human papillomavirus, biomarkers, RNA, immune-related genes, autophagy, epidemiology, incidence, mortality, lethality, five-year survival rate, prognosis.

Laryngeal cancer (LC) is a malignant tumor that develops from elements of the non-keratinizing epithelium of the larynx.

The etiologic factors remain unclear to date. In most cases, the patient's medical history includes untreated inflammatory and precancerous diseases of the larynx (laryngitis, papillomas, papillomatosis, dyskeratosis, leukoplakia, pachydermia, fibroma); a long period of smoking, alcohol consumption, work in dusty conditions (textile production), inhalation of harmful carcinogenic substances (oil, its distillation products, benzene, phenolic resins, asbestos); genetic predisposition (the presence of malignant diseases in relatives), as well as age and gender (males over 55 years of age) [1,2].

The diagnostic criteria are as follows. Complaints and medical history. Complaints: cough; hoarseness; sore throat radiating to the ear; difficulty breathing; choking when taking liquid food; enlarged cervical, supraclavicular, subclavian, submandibular, and submental lymph nodes. History: early symptoms of the disease in LC are: hoarseness and cough, which appear already at stage I of the disease; when, at the initial visit of patients, hoarseness has been observed for six months with the addition of other symptoms, this may indicate later stages (III-IV) of the disease. In this case, complaints of shooting pain in the ear, difficulty breathing, choking when taking liquid food or water, and the appearance of enlarged nodes on the neck are also added [1].

Physical examination: indirect laryngoscopy (tumor, formation of one of the parts of the larynx, limited mobility of the true vocal cord or fixation of the affected half of the larynx, narrowing of the glottis); palpation examination of the lymph nodes of the neck on both sides (the presence of enlarged cervical lymph nodes of a dense consistency, immobile or stiff, slightly painful or possibly not painful, more than 1.0 cm in size).

Laboratory tests: cytological examination (increase in cell size up to giant, change in the shape and number of intracellular elements, increase in the size of the nucleus, its contours, different degrees of maturity of the nucleus and other cell elements, change in the number and shape of nucleoli); histological examination (large polygonal or spiky cells with well-defined cytoplasm, round nuclei with clear nucleoli, with the presence of mitoses, cells are located in the form of cells and cords with or without keratin formation, the presence of tumor emboli in the vessels, the severity of lymphocytic plasmacytic infiltration, mitotic activity of tumor cells).

Instrumental examinations: ultrasound examination of the cervical, submandibular, supraclavicular, subclavian lymph nodes (contours are clear, uneven, echogenicity is reduced, there may be areas of mixed echogenicity, the structure of the node is heterogeneous, increased vascularization is possible); computed tomography of the larynx (a tumor formation of the larynx, occupying the right or left half, spreading to the piriform sinus or the root of the tongue or soft tissues of the anterior surface of the neck, or to the trachea area, conglomerates of lymph nodes of various sizes are possible, compressing or displacing or growing into the vascular-nerve bundle of the neck); biopsy of a laryngeal tumor (cytological examination of the material reveals an increase in the size of the cell up to giant, a change in the shape and number of intracellular elements, an increase in the size of the nucleus, its contours, different degrees of maturity of the nucleus and other elements of the cell, a change in the number and shape of nucleoli; histological examination of the material reveals large polygonal or spiky cells with well-defined cytoplasm, round nuclei with clear nucleoli, with the presence of mitoses, the cells are arranged in the form of cells and cords with or without the formation of keratin, the presence of tumor emboli in the vessels, the severity of lymphocyte-plasmocyte infiltration, mitotic activity of tumor cells); fine-needle aspiration biopsy of enlarged lymph nodes of the neck (during cytological examination of the material - an increase in the size of the cell up to giant, a change in the shape and number of intracellular elements, an increase in the size of the nucleus, its contours, different degrees of maturity of the nucleus and other elements of the cell, a change in the number and shape of nucleoli) [1].

As noted by Huang J. et al. [3] though the LC only has 1% of the total cancer cases and related deaths, it is a type of head and neck cancers with the highest prevalence. Cigarette smoking and alcohol consumption was found to have the strongest relation with LC; other potential risk factors include age (≥65), sex (male), family history of cancer, chemical workplace exposure, gastro-esophageal reflux, and exposure to human papillomavirus (HPV).

In their work, the authors emphasize that the global incidence and mortality rates of LC in 2020 was extracted from the Global Cancer Observatory (GLOBOCAN) database, developed by the International Agency for Research on Cancer, World Health Organization (WHO) [4].

The Gross Domestics Products (GDP) and Human Development Index (HDI) for each country were retrieved from World Bank and United Nations. For the categorization of HDI rates, <0.550, 0.550–0.699, 0.700-0.700, and ≥0.800 are considered low, medium, high, and very high. Data from 1980 to 2020 were obtained, and the data of the most recent 10 years were used for trend analysis. The WHO mortality database was used for cancer-related death data for each country and region. Cancer mortality data was collected from national civil cancer registries on a local and national level with the registering system logging verified cancer deaths and their causes, which is then reported to WHO annually. To ensure the quality of data, only figures with medium quality or above were published by the WHO mortality database based on the timeliness, completeness and coverage of registration and the proportion of deaths assigned to ill-defined causes. All incidence and mortality figures of LC were transformed - using the Segi-Doll world reference population for various nations - into an age-standardised rate (ASR) per 100 000 individuals. Weighting was allocated in accordance with proportions of people in the standard population’s corresponding age groups. This enabled the current study to compare incidence and mortality rates across different countries over time [3].

There were 184 615 newly reported cases of LC in 2020, with an ASR incidence of 2.0 per 100 000 persons. Incidence varied geographically, region with the highest incidence was Caribbean (ASR=4.0) followed by Central and Eastern Europe (ASR=3.6) and Southern Europe (ASR=2.9). Regions with the lowest incidence include Middle Africa (ASR=0.76), Western Africa (ASR=0.79), and Central America (ASR=0.86). There was a remarkable disparity among the two sexes in terms of incidence, as the global ASR of males (ASR=3.6) was more than seven times higher than that of females (ASR=0.49). The highest incidence was in countries with medium HDI (ASR=2.5), followed by very high HDI (ASR=2.3), high HDI (ASR=1.6), and low HDI (ASR=0.94). In 2020, 99 840 LC-related deaths were reported, which was slightly more than 1% of the total cancer-related deaths. Globally, LC has an ASR of 1.0 per 100 000 persons in mortality. In terms of the geographical distribution, the Caribbean region (ASR=2.1) had the highest mortality rate, doubling the global average, followed by Central and Eastern Europe (ASR=1.9), and South-Central Asia (ASR=1.7). Regions with the lowest mortality were Australia and New Zealand (ASR=0.34), Micronesia (ASR=0.45), and Middle Africa (ASR=0.54). Similar to incidence, the highest mortality was in countries with medium HDI (ASR=1.6), followed by high HDI (ASR=0.92), very high HDI (ASR=0.86), and low HDI (ASR=0.71). Among males LC incidence was associated with a higher HDI [β=0.175, 95% confidence interval (CI): 0.111-0.239, $P<0.001$], prevalence of smoking (β=0.051, 95% CI: 0.041-0.061, $P<0.001$), alcohol drinking (β=0.040, 95% CI: 0.028-0.052, $P<0.001$), unhealthy dietary (β=0.012, 95% CI: 0.006-0.018, $P<0.001$), obesity (β=0.022, 95% CI: 0.012-0.031, $P<0.001$), hypertension (β=0.031, 95% CI: 0.022-0.041, $P<0.001$), diabetes (β=0.032, 95% CI: 0.014-0.051, $P=0.001$), and lipid disorders (β=0.021, 95% CI: 0.013-0.029, $P<0.001$). Among females, incidence was associated with a higher HDI (β=0.114, 95% CI: 0.050-0.178, $P<0.001$), prevalence of smoking (β=0.049, 95% CI: 0.033-0.065, $P<0.001$), inactivity (β=0.040, 95% CI: 0.009-0.072, $P=0.011$), obesity (β=0.013, 95% CI: 0.004-0.022, $P=0.004$), hypertension (β=0.012, 95% CI: 0.002-0.023, $P=0.024$), diabetes (β=0.051, 95% CI: 0.031-0.071, $P<0.001$), and lipid disorders (β=0.015, 95% CI: 0.007-0.023, $P<0.001$). Among males LC mortality was associated with a higher

HDI (β=0.094, 95% CI: 0.025-0.163, P<0.001), prevalence of smoking (β=0.044, 95% CI: 0.033-0.054, P<0.001), alcohol drinking (β=0.025, 95% CI: 0.013-0.038, P<0.001), unhealthy dietary (β=0.009, 95% CI: 0.003-0.015, P=0.002), obesity (β=0.016, 95% CI: 0.006-0.025, P=0.001), hypertension (β=0.025, 95% CI: 0.015-0.034, P<0.001), and lipid disorders (β=0.013, 95% CI: 0.004-0.021, P=0.003). Among females, mortality was associated with a lower GDP per capita (β=−0.076, 95% CI: −0.126-0.027, P=0.003), and prevalence of alcohol drinking (β =−0.060, 95% CI: −0.085-0.035, P<0.001) [3].

Overall, more countries were showing decreasing trends than increasing trends in LC while such trends were less evidence among female population, younger subjects, and countries from Europe. The overall incidence for males was decreasing while females reported mixed trends. For males, significant increases were found only in Cyprus [average annual percent change (AAPC)=5.88; 95% CI: 0.52-11.52; P=0.035)], whilst decreasing trends were reported in 24 countries evenly distributed in different continents, Chile (AAPC=−11.5; 95% CI: −20.99-0.88; P=0.038) reported the largest decrease, followed by the Philippines (AAPC=−7.71; 95% CI: −12.15-3.05; P=0.006), and Norway (AAPC=−5; 95% CI: −8.71-1.14; P=0.018). For females, three countries showed significant increasing trends: Japan (AAPC=6.01; 95% CI: 1.51-10.71; P=0.015), Switzerland (AAPC=5.61; 95% CI: 0.05-11.49; P=0.048), and Czech Republic (AAPC=3.31; 95% CI: 1.28-5.39; P=0.005). Evident decreases were found in six countries, with India (AAPC=−8.35; 95% CI: −13.62-2.75; P=0.009), Korea (AAPC=−8.28; 95% CI: −11.68-4.74; P=0.001), and Turkey (AAPC=−6.05; 95% CI: −10.21-1.69; P=0.013) reporting the largest decreases. Similar to the incidence trends, there was a remarkable difference between the mortality trends of males and females. For males, only Thailand (AAPC=5.41; 95% CI: 3.56-7.30; P<0.001) reported significant increases. On the contrary, significant decreases were observed in 30 countries. The largest decreases were found in Korea (AAPC=−7.17; 95% CI: −8.65-5.66; P<0.001), Singapore (AAPC=−7.10; 95% CI: −13.59-0.11; P=0.047), and France (AAPC=−5.96; 95% CI: −6.76-5.15; P<0.001). For females, significant increasing trends were found in Israel (AAPC=12.49; 95% CI: 0.81-25.51; P=0.038); while significant decreases were reported in eight countries, with Korea (AAPC=−10.58; 95% CI: −15.61-5.24; P=0.002), Belarus (AAPC=−7.93; 95% CI: −13.55-1.95; P=0.010), and Colombia (AAPC=−5.68; 95% CI: −8.04-3.27; P=0.001) reported the most evident decreases. For the older males aged 50 or above two countries reported significant increases: Cyprus (AAPC=6.87; 95% CI: 1.16-12.91; P=0.024), and Belarus (AAPC=1.41; 95% CI: 0.28-2.55; P=0.021). In contrast, significant decreases were observed in 21 countries sporadically distributed worldwide. The largest decreases were found in Chile (AAPC=−10.31; 95% CI: −19.44-0.14; P=0.048), Philippines (AAPC=−7.57; 95%; CI: −11.86-3.08; P=0.005), and Norway (AAPC=−5.69; 95% CI: −8.87-2.41; P=0.004). For females aged 50 or above, three countries, all European countries, reported significant increases: Spain (AAPC=6.76; 95% CI: 2.03-11.72; P=0.01), Switzerland (AAPC=5.38; 95% CI: 0.25-10.78; P=0.042), and Czech Republic (AAPC=4.00; 95% CI: 1.73-6.32; P=0.003) reported the largest increases. On the other hand, four populations showed significant decreasing trends, Turkey (AAPC=−6.50; 95% CI: −11.64-1.07; P=0.025) reported the largest decline, followed by Canada (AAPC=−4.36; 95% CI: −6.94-1.70; P=0.006), and the white population in the USA (AAPC=−2.98; 95% CI: −5.13-0.78; P=0.014). Similar distribution but larger increase was found in males aged below 50 Norway (AAPC=18.77; 95% CI: 4.55-34.92; P=0.014) and Thailand (AAPC=10.24; 95% CI: 0.36-21.09; P=0.044) reported significant increasing trends, whereas evident decreasing trends were observed in 17 countries, predominately Asian and European countries, with Germany (AAPC=−17.17; 95% CI: −26.66-6.44; P=0.007), Denmark (AAPC=−9.88; 95% CI: −17.74-1.26; P=0.030), and France (AAPC=−9.66; 95% CI: −14.70-4.32; P=0.004) showing the greatest decreases. From the raw data, the highly significant increasing trend observed in the younger male population of Norway and Thailand was likely due to the statistical base effect as unusually low ASR was reported in the start of the 10-year interval 2010-

2011 (Norway); 2003 (Thailand). For their younger females aged below 50, significant decreases were observed in two countries/regions: Hong Kong, SAR, China (AAPC=−12.44; 95% CI: −21.77-1.99; P=0.026) and Korea (AAPC=−11.79; 95% CI: −21.66-0.67; P=0.041), while no country reported significant increase [3].

In conclusion, our colleagues point out that the reported incidence for LC has been decreasing remarkably for the past decades, especially for the male population, potentially due to the reduced consumptions of cigarettes and alcohol. Its mortality has also been decreasing, possibly attributable to broader availability and applications of treatments. However, regional disparity in mortality remains due to difference in level of access to surgical care. On the contrary, it is alarming that some evident increases were observed in the female populations and younger subjects from some countries. If no mitigation interventions are implemented, such trends may continue. It is also recommended that governments should continue the implementation of smoking and alcohol reduction campaigns, to minimize further burden on healthcare system.

Nocini R. et al. in their work they say that [5] LC is a form of malignancy originating from the anatomic site called larynx (also commonly known as "voice box"), which is anatomically divided in three regions including the supraglottic larynx (encompassing the epiglottis, false vocal cords, ventricles, aryepiglottic folds and arytenoids), the glottis (encompassing the true vocal cords and the anterior and posterior commissures) and the subglottic region. Among squamous cell carcinomas, the well and moderately differentiated forms slightly prevail over poorly differentiated tumors; the larger number of LC cases originate from the glottic region (i.e., approximately two-third), followed by the supraglottic area (about 30%), whilst transglottic and purely subglottic tumors are generally less frequent. The more important risk factors for LC include tobacco use, excessive alcohol ingestion, gastro-esophageal reflex, Plummer-Vinson syndrome, anatomical malformations, exposure to heat, chemicals, asbestos, nickel or ionizing radiations, along with some viral infections (e.g., HPV). The most frequent symptoms of laryngeal malignancies include hoarseness, sore throat, dysphagia and/or painful swallowing, impairment in voice quality, otalgia, cough and hemoptysis. Despite hoarseness can develop early in patients with laryngeal malignancies, in many cases the cancer has already deeply involved the vocal cords and spreads to regional lymphatics at diagnosis. Primary tumor volume, composite nodal volumes, composite primary tumor and nodal volumes are significant predictors of unfavorable prognosis, along with advanced age, performance status, grade and depth of invasion.

In their work, the researchers note that LC is an important oncologic entity, whose prognosis depends on establishing appropriate preventive and diagnostic measures, especially in populations at higher risk. The current incidence, prevalence and mortality of LC are estimated at 2.76 cases/year per 100,000 inhabitants, 14.33 cases/year per 100,000 inhabitants and 1.66 deaths/year per 100,000 inhabitants, respectively, averaging 3.28 million Disability-Adjusted Life Years each year. Incidence and prevalence have increased by 12% and 24%, respectively during the past 3 decades, whilst mortality has declined by around 5%. The epidemiologic burden of this malignancy is approximately 5-fold higher in males and increases in parallel with ageing, peaking after 65 years of age. Both incidence and mortality rates are higher in Europe and lower in Africa, but the ratio between deaths and incidence is the highest in Africa. Incidence has gradually declined in Europe during the past 3 decades, whilst it has increased in South-East Asia and Western Pacific. Cigarette smoking and alcohol abuse contribute for about 90% of overall worldwide mortality for LC. At the same time, the conclusions state that LC still poses a high clinical and societal burden, with an escalating temporal trend not expected to reverse soon [5].

An interesting work was presented by Li C. et al. [6]. In this study, authors aimed to explore the roles of cuproptosis-related genes in LC and their potential as prognostic markers and therapeutic targets. LC, characterized by high recurrence rates and a lack of effective biomarkers, has been associated with cuproptosis, a regulated cell death process linked to cancer progression.

They collected comprehensive data from The Cancer Genome Atlas and Gene Expression Omnibus databases, including gene expression profiles and clinical data of LC patients. Using clustering and gene analysis, researchers identified cuproptosis-related genes with prognostic significance. A risk model was constructed based on these genes, categorizing patients into high- and low-risk groups for outcome comparison. Univariate and multivariate analyses were conducted to identify independent prognostic factors, which were then incorporated into a nomogram. Gene Set Enrichment Analysis was employed to explore pathways distinguishing high- and low-risk groups. This risk model, based on four genes, including transmembrane 2, dishevelled binding antagonist of β-catenin 1, stathmin 2, and G protein-coupled receptor 173, revealed significant differences in patient outcomes between high- and low-risk groups. Independent prognostic factors were identified and integrated into a nomogram, providing a valuable tool for prognostic prediction. Gene Set Enrichment Analysis uncovered up-regulated pathways specifically associated with high-risk patient samples. The authors point out that this study highlights the potential of cuproptosis-associated genes as valuable prognostic markers and promising therapeutic targets in the context of LC and sheds light on new avenues for understanding and treating this complex disease.

In a study by Ren L. et al. [7], immune signatures of LC were systematically analyzed and their role in tumor progression was assessed. Differentially expressed immune-related genes (IRGs) were screened between LC and normal tissues from The Cancer Genome Atlas (TCGA) dataset. Then, two prognosis-related IRGs aquaporin 9 (AQP9) and zeta chain of T cell receptor associated protein kinase 70 (ZAP70) were analyzed by a series of survival analysis. Based on them, molecular subtypes were constructed by unsupervised cluster analysis. Differences in survival outcomes, human leukocyte antigen (HLA) expression and immune cell infiltrations were assessed between subtypes. Expression of AQP9 and ZAP70 was validated in LC tissues and cells by reverse transcription-quantitative polymerase chain reaction (RT-qPCR) and immunohistochemistry. After silencing and overexpressing AQP9 and ZAP70, cholecystokinin-8 (CCK-8), 5-ethynyl-2'-deoxyuridine (EdU), wound healing and transwell assays were performed in TU212 and LCC cells. Totally, 315 IRGs were abnormally expressed in LC. Among them, AQP9 and ZAP70 were distinctly correlated to patients' prognosis. Two subtypes were developed with distinct survival outcomes, HLA expression and immune microenvironment. Low expression of AQP9 and ZAP70 was confirmed in LC. AQP9 and ZAP70 up-regulation distinctly suppressed proliferation, migration, and invasion of LC cells. The opposite results were investigated when their knockdown.

Our colleagues focus on the fact that the obtained findings revealed the roles of AQP9 and ZAP70 in progression of LC, and suggested that AQP9 and ZAP70 could potentially act as candidate immunotherapeutic targets for LC. Collectively, this study proposed two prognosis-related IRGs AQP9 and ZAP70. Two molecular subtypes based on AQP9 and ZAP70 may reflect immune microenvironment of LC. In vitro, their up-regulation inhibited proliferation, migration and invasion of LC cells. Results obtained demonstrated that AQP9 and ZAP70 might be candidate therapeutic targets and prognostic signatures for LC, which may assist guide clinical therapy in the future [7].

Liu W. et al. [8] in their work they say that LC is one of the most common malignant tumors among head and neck cancers. Accumulating studies have indicated that long noncoding RNAs (lncRNAs) play an important role in LC occurrence and progression, however, the functional roles and relative regulatory mechanisms of lncRNA growth arrest-specific transcript 5 (GAS5) in LC progression remain unclear. The expression of lncRNA GAS5 in both LC tissues and cell lines was evaluated using quantitative RT-qPCR assay.

The relationships between lncRNA GAS5 expression and clinical parameters were also analyzed. To determine the biological function of lncRNA GAS5, a lncRNA GAS5-specific plasmid was first transfected into LC cells using lentiviral technology. Cell counting kit-8 assay, flow cytometry, and Transwell assays were used to detect in vitro cell proliferation, apoptosis, cycle distribution, and metastasis abilities, respectively. Furthermore, in vivo cell growth experiments were also performed using nude mice. Additionally, western blotting was performed to identify the underlying regulatory mechanism. In the current study, lncRNA GAS5 was downregulated in LC tissues and its low expression was closely associated with poor tumor differentiation, advanced TNM stage, lymph node metastasis, and shorter overall survival time. In addition, lncRNA GAS5 upregulation significantly inhibited LC cell proliferation both in vitro and in vivo. Moreover, in response to lncRNA GAS5 overexpression, more LC cells were arrested at the G2/M stage, accompanied by increased cell apoptosis rates and suppressed migration and invasion capacities. Mechanistically, this data showed that the overexpression of lncRNA GAS5 significantly regulated the PI3K/AKT/mTOR signaling pathway. LncRNA GAS5 might act as a suppressor gene during LC development, as it suppressed cell proliferation and metastasis by regulating the PI3K/AKT/mTOR signaling pathway; thus, lncRNA GAS5 is a promising therapeutic biomarker for the treatment of LC. Overall, lncRNA GAS5 could serve as a tumor suppressor gene in LC, which would be a promising therapeutic biomarker for LC treatment.

Liberale C. et al. [9] note that LC is one of the most frequent tumors of the upper aero-digestive tract. While certain factors such as alcohol consumption and tobacco smoking have been established as risk factors for LC, the correlation of many other risk factors with the mechanism of carcinogenesis remains unclear. The process of laryngeal carcinogenesis has been well described; however, there are still aspects that lack understanding, and the underlying biological mechanisms have not been fully elucidated. Indeed, the emerging role of lncRNAs, miRNAs, and mRNAs is becoming increasingly important in our understanding of cancer development and its clinical and therapeutic implications. These non-coding RNAs have been shown to play critical roles in various aspects of cancer biology, including tumor initiation, progression, metastasis, and response to treatment. Gaining insight into the molecular mechanisms involved in carcinogenesis could enable the prediction of tumor progression and facilitate targeted interventions at various stages of the disease. The ultimate goal is to develop precise and effective therapies through a precision medicine approach. Achieving this objective requires further comprehensive studies on the molecular biology of cancer and the role of different risk factors.

Özdaş T. et al. [10] point out that while LC does not show any obvious early symptoms, it tends to have a poor prognosis in advanced clinical stages. Chromosome region maintenance 1 (CRM1) mediates the nuclear export of some RNAs, major and tumor suppressor proteins and has been associated with the pathogenesis of many tumors. However, the clinicopathological significance of CRM1 gene expression in LC has not been clarified yet. CRM1 expression in matched tumor and normal tissues obtained from 43 LC patients were evaluated intracellular for protein and mRNA levels by immunohistochemical staining (IHC), western-blot, and quantitative real-time qRT-PCR, respectively. IHC, western-blot, and qRT-PCR analyses showed that CRM1 expression was significantly increased in LC tissue compared to normal tissue. Increased expression of CRM1 has been associated with poor prognostic clinicopathological features, including advanced tumor stage, increased tumor invasion, larger tumor size, positive lymph node metastasis, distant metastasis, and invasive histological type by IHC, western-blot, and qRT-PCR. Kaplan–Meier survival analysis showed that patients with high expression of CRM1 exhibited lower overall survival compared to those with low expression (Log-rank = 7.16, $p = 0.007$). According to the TCGA datasets, elevated CRM1 expression in head and neck cancer including cases of squamous cell laryngeal origin is associated with advanced tumor stage and histological grade ($p > 0.05$, for all). Consequently, CRM1 plays an important role in LC and may serve as an indicator and prognostic factor for poor overall survival in LC patients. In conclusion, this study revealed that CRM1 is a predictive biomarker for poor overall survival in LC patients, and that the evaluation of the clinical pTNM staging system of the tumor and CRM1 expression together may provide additional prognostic information. Moreover, inhibition of CRM1 expression may be a new therapeutic strategy for LC. Furthermore, prospective large-scale studies are needed to explore the true prognostic role of elevated CRM1 expression in laryngeal squamous cell carcinoma.

The aim of the study by Luo M.S. et al. [11] was to develop an autophagy-related model to predict the prognosis of patients with LC. Autophagy, a major cause of cancer-related death, is correlated with the pathogenesis of various diseases including cancers. Our colleagues analyzed the correlation between expression profiles of autophagy-related genes (ARGs) and clinical outcomes in 111 LC patients from TCGA. Afterward, gene functional enrichment analyses of gene ontology and Kyoto Encyclopedia of Genes and Genomes were performed to find the major biological attributes. Univariate Cox regression analyses and multivariate Cox regression analyses were performed to screen ARGs whose expression profiles were significantly associated with LC patients overall survival (OS). Furthermore, to provide the doctors and patients with a quantitative method to perform an individualized survival prediction, we constructed a prognostic nomogram. Thirty eight differentially expressed ARGs were screened out in LC patients through the TCGA database. Related functional enrichments may act as tumor-suppressive roles in the tumorigenesis of LC. Subsequently, 4 key prognostic ARGs (IKBKB, ST13, TSC2, and MAP2K7) were identified from all ARGs by the Cox regression model, which significantly correlated with OS in LC. Furthermore, the risk score was constructed, which significantly divided laryngeal cancer patients into high- and low-risk groups. Integrated with clinical characteristics, gender, N and the risk score are very likely associated with patients OS. A prognostic nomogram of ARGs was constructed using the Cox regression model. As the researchers note this study could provide a valuable prognostic model for predicting the prognosis of LC patients and a new understanding of autophagy in LC. A novel autophagy-related model and a predictive nomogram were conducted to robustly estimate LC patients survival.

Now, regarding this pathology in our country at the republican level. The incidence of LC in the Republic of Kazakhstan in 2023 was 2.2 per 100 thousand population with an increase rate of 15.5% compared to the previous year (1.9 in 2022), which in absolute numbers amounted to 436 people (370 cases a year earlier), second only to prostate cancer (16.7%). The proportion of cases diagnosed for the first time in life, recorded by oncology organizations, was 1.2% (1.1% in 2022). At the same time, 384 men fell ill (the proportion is 2.4%, 13th rank place), women - 52 (the proportion is 0.2%, 22nd rank place), which clearly shows the gender difference in the incidence of this pathology with a pronounced predominance of the male population [12].

The LC level above the national average was established in 9 regions of the country: North Kazakhstan - 5.8 (the maximum indicator); Pavlodar - 3.8; Kostanay - 3.6; East Kazakhstan - 3.4; Abay - 3.3; Karaganda - 3.0; Akmola and Atyrau - 2.9; Mangistau - 2.6. This indicator is below the national average in 11 regions: Turkestan - 0.6 (the lowest level); the city of Astana - 1.0; Kyzylorda - 1.2; the city of Shymkent - 1.5; Ulytau and Almaty - 1.8; West Kazakhstan and Zhambyl - 1.9; Aktobe and Zhetysu regions and the city of Almaty - 2.1 per 100 thousand population. Mortality from this pathology was 0.8 per 100 thousand population, the same as a year earlier. The regions where the mortality rate from LC is above the average in the republic include: Abay - 2.5 (maximum level); North Kazakhstan - 1.9; Pavlodar - 1.6; Mangistau and Karaganda - 1.2; Zhetysu - 1.0; Aktobe - 0.9. Akmola, East Kazakhstan, Kostanay regions and the city of Almaty are on par with the national average. The lowest rates were noted in Ulytau - 0.0; Turkestan - 0.1; West Kazakhstan and the city of Shymkent - 0.3; Kyzylorda - 0.5; Atyrau and the city of Astana - 0.6; Zhambyl and Almaty - 0.7 regions per 100 thousand people [12].

One-year lethality was 19.2%, taking the 13th place among all nosological forms of malignant neoplasms. At the same time, the ratio between one-year lethality and neglect (stage IV) was 1.6. At the same time, we recall that the farthest from "1" is the worst ratio between the indicators of one-year lethality and neglect.

Next, regarding preventive examinations. It should be noted that during large-scale preventive examinations of the population in 2023, significantly more patients with malignant neoplasms were actively identified than in 2022. This is 25,193 patients versus 23,623 patients identified in 2022, i.e. +6.6%. This is due to the further abatement of the epidemiological trouble with coronavirus and the increased availability of preventive care for the population. The proportion of patients identified during routine examinations increased from 62.0% to 62.4% of the total number of patients identified per year. As for LC, the early detection of this pathology during preventive examinations increased significantly - from 50.6 to 60.9%. The number of newly identified patients with LC registered with oncology organizations amounted to 425 patients (365 patients in 2022). At the same time, the absolute number of patients with LC identified during medical examinations was 274 people (231 a year earlier), and the proportion was 64.5% and 63.3%, respectively. 167 people out of 274 are patients with stages I and II (in 2022 - 117 patients out of 231). The proportion of patients with LC detected at early stages, as indicated above, was 60.9% against 50.6% a year earlier.

Of course, when analyzing the epidemiological situation, early diagnosis indicators are very important issues.

The regions where the proportion of patients with early stage I of the pathology in question is above the national average (16.5% - 14th rank) include the following regions: the city of Almaty - 34.8% (the best indicator); Abay and Kyzylorda - 30.0%; West Kazakhstan and the city of Astana - 23.1%; North Kazakhstan - 22.6%; Karaganda - 18.8%; Akmola - 18.2%. The lowest rates of early diagnosis were recorded in the Ulytau region (not a single patient with stage I of the disease - 0.0%). Next come: Mangistau - 5.3%; the city of Shymkent - 5.6%; Kostanay - 6.7%; Pavlodar, Zhetysu and Almaty - 7.1%; Atyrau - 10.0%; Zhambyl - 13.0%; East Kazakhstan - 14.3%; Aktobe - 15.0% and Turkestan - 15.4% of the country's regions [12].

It should be noted that every second patient with LC is detected in the early (I-II) stages of this pathology (51.1%). However, the situation with this indicator is deplorable in the Ulytau region - there is not a single patient detected in the early stages of the disease. The regions where the proportion of patients with LC detected at stages I-II is above the national average include the following regions. The best indicator is in the city of Astana - 76.9%. Then follow: Pavlodar - 75.0%; West Kazakhstan - 69.2%; North Kazakhstan - 67.7%; Zhambyl - 65.2%; Aktobe - 65.0% regions and the city of Almaty - 63.0%. Low rates of early diagnosis were recorded in Ulytau - 0.0% (the worst result in the country); Turkestan - 15.4%; Almaty - 21.4%; the city of Shymkent - 22.2%; Zhetysu - 35.7%; Mangistau - 42.1%; East Kazakhstan - 42.9%; Atyrau - 45.0%; Kostanay - 46.7%; Abay, Akmola, Karaganda and Kyzylorda - 50.0% regions [12].

As is clearly seen from the above data, there is a very large spread in early diagnostics rates across the country, from very good to dismal. Of course, it is necessary to take into account migration processes and other factors that affect early diagnostics rates, but nevertheless, the results obtained give reason not to stop there, both for oncologists and otolaryngologists, general practitioners, since improving early diagnostics rates of malignant tumors, as one of the main postulates and one of the main tasks of medicine in general, continues to be relevant today. The proportion of stage IV LC was 9.4%. At the same time, as mentioned above, the proportion of patients with this nosological form of malignant neoplasms detected at stages I-II was 51.1% (stage I - 16.5%, stage II - 34.6%), which indicates that the largest number of patients with LC was detected at locally advanced with loco-regional damage - stage III of the disease. This stage was 39.5%, i.e. almost two patients out of every five, and we know what aggressive, often complex treatment is used with such a spread of the oncological process and what a disappointing prognosis is for these patients. As for the average national indicator of the proportion of stage IV (9.4%), against this background, West Kazakhstan, Mangistau, Turkestan regions and three megalopolises - the cities of Astana, Almaty, Shymkent stand out, where not a single patient was detected in the terminal stage - 0.0%. Then come: Almaty - 3.6%; Aktobe - 5.0%; North Kazakhstan

- 6.5%; Zhetysu and Pavlodar - 7.1%; Zhambyl - 8.7%; Kyzylorda - 10.0%; Kostanay - 13.3%; East Kazakhstan - 14.3%; Atyrau - 20.0%; Akmola - 22.7% regions. This list is closed by three regions, where every fourth patient was detected in the incurable stage of the disease with the worst indicator of 25.0% - Abay, Karaganda and Ulytau regions [12].

The morphological verification rate of LC in the country was 98.8%, second only to non-melanoma skin cancer (99.6%), breast cancer (99.4%) and lip cancer (99.1%) in the first three positions. At the same time, in the Pavlodar region, the morphological verification rate was 92.9%, in Akmola - 95.5%, in Almaty - 96.4%. In other regions, the disease verification rate was 100%.

The total number of patients with malignant neoplasms registered with specialized oncology organizations of the republic continued to increase and by the end of 2023 amounted to 218,186 people, with an increase of 6.0% compared to the previous year (2022 - 205,822, +5.8%). The overall incidence rate of malignant neoplasms increased by 3.9%, from 1055.3 to 1096.4 per 100 thousand people. The growth of this indicator is due to both the increase in the incidence and detection of pathology, and the increase in the survival of cancer patients. In addition, statistical data on patients diagnosed with malignant neoplasms, who have been under observation for 5 years or more, and continue to be observed in 2023, showed that the number of patients under the observation of oncological organizations in Kazakhstan for over five years continued to grow and at the end of the reporting year amounted to 117,616 people, with an increase of 6.2% (2022 - 110,790 people, + 6.6%) (form No. 7).

It is impossible to ignore such an important clinical aspect as the coverage of patients with a first-time diagnosis of LC in the Republic of Kazakhstan with special treatment.

In 2023, the number of hospitalizations for all nosological forms of malignant tumors in the country's oncology organizations amounted to 108,252 cases (2022 - 101,095), with an increase of 7.1% compared to the previous year, which is associated with a constant increase in the number of cancer patients, improved standardization of oncological care, and the development of palliative and restorative services.

At the end of 2023, the absolute number of LC patients who completed specialized treatment was 247 people, continuing treatment - 135 patients. The following results were obtained in percentage terms by methods and types of treatment. Only 12.6% of patients received surgical treatment, only radiation - 19.4%, only drug treatment - 8.9%, combined - 26.7%, complex - 21.5% and chemo-radiation - 10.1%.

Further, regarding the five-year survival of patients. As for LC, at the end of 2023, 2032 people were registered for dispensary care, or 10.2 per 100 thousand of the population. At the end of 2022 - 1899 patients or 9.7 per 100 thousand of the population, respectively.

At the same time, the mortality rate of the observed contingents in 2023 decreased compared to the previous year and amounted to 7.6% in 2023 (8.6% in 2022).

The five-year survival rate of patients with LC was 52.2% in 2023 and 53.2% in 2022 [12].

Summarizing the above, we can conclude that LC, despite not having the highest place in terms of incidence among all existing malignant tumors of other localizations, deserves close attention from specialized specialists. At the same time, taking into account a number of factors, the indicators of early diagnostics do not allow oncologists to "sleep peacefully", since the locally advanced stage III, which prevails over all stages, in addition to being widespread, gives a large number of complications due to the location of vital centers and tissue structures near the primary focus and locoregional metastases. The veiled and variable symptoms, its similarity with various non-core processes, leads to the neglect of the disease. All this requires both oncologists and, first of all, primary health care workers and, of course, otolaryngologists to increase the level of cancer alertness, inform the population about early symptoms that may indicate this pathology or the onset of proliferative changes and conduct high-tech diagnostic measures, including for the purpose of differential diagnosis and, as a result, timely treatment. People from the risk group are recommended to visit specialized specialists annually and, if necessary, undergo an examination.

An epidemiological assessment of the situation with LC in our country suggests that there are sometimes significant differences in the regions not only in incidence rates, but also in the state of early diagnosis and mortality from this disease. In connection with the above, this pathology continues to be a serious problem in modern clinical oncology.

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Modern approaches to the treatment of chronic obstructive pulmonary disease. Brief review of the literature

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Annotation

Chronic obstructive pulmonary disease (COPD) remains one of the leading causes of morbidity and mortality in the world. The purpose of this literature review is to analyze modern approaches to the diagnosis and treatment of COPD, with an emphasis on drug therapy, rehabilitation programs and innovative directions. The review is based on data from the latest clinical guidelines, international studies and meta-analyses.

Keywords. COPD, pulmonology, bronchodilators, inhaled corticosteroids, rehabilitation, biomarkers

Introduction

Chronic obstructive pulmonary disease (COPD) is a progressive disease characterized by persistent airflow limitation caused by inflammation of the airways in response to harmful particles or gases, especially tobacco smoke. According to the World Health Organization (WHO), COPD is one of the leading causes of death worldwide.

Effective treatment of COPD requires a comprehensive approach that takes into account the individual characteristics of the patient, the severity of the disease, the frequency of exacerbations, and the presence of comorbidities. In recent years, significant progress has been noted in understanding the pathogenesis of COPD and the development of new therapeutic strategies.

Purpose of the study

To conduct an analysis of modern scientific literature on the problem of COPD in order to summarize data on current treatment methods, their effectiveness and promising areas of therapy.

Modern approaches to the treatment of chronic obstructive pulmonary disease.

Chronic obstructive pulmonary disease (COPD) is a global health problem. According to the WHO, more than 300 million people suffer from COPD, and about 3 million people die from its complications every year. The disease is characterized by persistent airflow limitation, which is not completely reversible, and is associated with an inflammatory response of the lungs to harmful particles or gases, most often tobacco smoke.

Etiology and pathogenesis.

The main risk factor for COPD is smoking. Air pollution, occupational hazards, frequent infections in childhood and genetic abnormalities such as α1-antitrypsin deficiency also have a significant impact.

The pathogenesis of COPD includes:

- chronic inflammation of the respiratory tract;
- remodeling of the bronchial wall;
- destruction of the alveolar septa;
- impaired mucociliary clearance;
- development of pulmonary hypertension and right ventricular failure in the late stages.

Diagnosis and classification.

The diagnosis of COPD is established based on the anamnesis, clinical manifestations (cough, dyspnea, sputum), physical examination data and spirometry.

The confirmation criterion is the post-bronchodilator ratio FEV1/FVC <0.7.

The severity of the disease is classified according to GOLD based on FEV1:

• GOLD 1: mild (FEV1 ≥ 80%);
• GOLD 2: moderate (50% ≤ FEV1 <80%);
• GOLD 3: severe (30% ≤ FEV1 <50%);
• GOLD 4: extremely severe (FEV1 <30%).

An ABCD strategy is also used, taking into account symptoms and the frequency of exacerbations, which allows for individualization of therapy.

Drug treatment.

1. Inhaled bronchodilators are the mainstay of COPD therapy:

• Long-acting β2-agonists (formoterol, salmeterol);
• Long-acting anticholinergics (tiotropium, aclidinium);
• LABA + LAMA combinations (e.g. vilanterol + umeclidinium).

Advantages of combination therapy:

• Improved lung function;
• Symptom reduction;
• Reduced frequency of exacerbations;
• Improved quality of life.

2. Inhaled corticosteroids (ICS) ICS are used in patients with a high frequency of exacerbations and an eosinophilic phenotype. Efficacy is higher with an eosinophil count> 300 cells/μl. Possible combinations: budesonide + formoterol, fluticasone + salmeterol.

Side effects:

• Increased risk of pneumonia;
• Oral candidiasis;
• systemic effects with prolonged use.

3. Triple therapy is used in patients with severe course and ineffective dual therapy. Example: beclomethasone + formoterol + glycopyrronium.

4. Mucolytics and antioxidants Mucolytics (ambroxol, acetylcysteine) are indicated in the presence of viscous sputum and chronic bronchitis. They have an antioxidant effect and can reduce the frequency of exacerbations.

Non-drug treatment.

Smoking cessation is the most effective strategy for slowing the progression of COPD. Behavioral therapy, nicotine replacement drugs, varenicline are used. The comprehensive program includes physical training, breathing exercises, psychological support, education. Improves endurance and reduces shortness of breath. Oxygen therapy: Indicated for patients with chronic hypoxemia (PaO2 <55 mmHg or SaO2 <88%). Long-term oxygen therapy (> 15 hours per day) reduces mortality. Vaccination against influenza and pneumococcus is mandatory. Reduces the frequency of infectious exacerbations.

Exacerbation is an acute worsening of symptoms that requires a change in COPD exacerbations treatment. Causes: infections, air pollution, poor compliance.

Treatment:

• increasing the dose of bronchodilators;
• systemic glucocorticoids (prednisolone 30-40 mg / day for 5-7 days);
• antibiotics for purulent sputum;
• hospitalization for severe exacerbations.

Innovative approaches.

Biological therapy is a new direction for patients with eosinophilic inflammation and frequent exacerbations. Monoclonal antibodies to IL-5 (mepolizumab) and anti-IgE (omalizumab) are used. Personalized medicine Determination of COPD phenotypes (frequent exacerbators, bronchitis, emphysematous, eosinophilic) allows for individualized treatment approaches.

The use of "smart" inhalers, mobile applications, and remote monitoring increases adherence and control over the course of the disease.

Conclusions

Modern approaches to COPD treatment involve the use of combined drug therapy, the introduction of rehabilitation programs and personalized medicine technologies. Progress in molecular biology and pharmacology creates prospects for new treatment methods. An integrated approach and early diagnostics remain key factors in successful disease control.

Bacterial meningitis

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ANNOTATION
Bacterial meningitis is a life-threatening infection of the central nervous system characterized by rapid onset and high morbidity. This review provides a comprehensive overview of its pathophysiology, focusing on how pathogens such as Streptococcus pneumoniae and Neisseria meningitidis penetrate the subarachnoid space, evade immune defenses, and induce a severe inflammatory response. This cascade results in increased intracranial pressure, cerebral edema, vasculitis and subsequent neuronal injury and ischemia.Special attention is given to bacterial meningitis in newborns, outlining transmission mechanisms including vertical and nosocomial routes, along with the heightened risk of long-term neurological complications.The review also incorporates epidemiological data from Kazakhstan, highlighting regional patterns in incidence and mortality.
Key words: Bacterial meningitis (BM), subarachnoid space, Streptococcus pneumoniae, Neisseria meningitidis, CNS, CSF, Listeria monocytogenes.

The term "meninges" refers to the membranes that cover the brain and spinal cord. The meninges consist of three layers that cover the brain and get their names in order from the outside in: the dura mater, the arachnoid mater, and the pia mater. The meninges are also known as the membranes that surround the brain and spinal cord. Acute inflammation of the membranes that surround and protect the brain and spinal cord are the symptoms of meningitis [12]. Bacterial meningitis is an inflammation of the meninges, in particular the arachnoid and the pia mater, associated with the invasion of bacteria into the subarachnoid space [11].

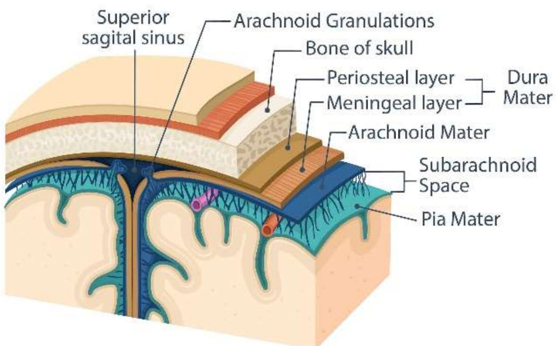

Figure 1 depicts the meningeal layers commonly affected by inflammation during bacterial meningitis (mainly the arachnoid and pia mater, inflamed due to bacterial invasion of the subarachnoid space) [23].

Bacterial meningitis is a very serious type of meningitis. Bacterial meningitis is a worldwide health problem, with incidence rates ranging from approximately 0.9 per 100 000 individuals per year in high-income countries to 80 per 100 000 individuals per year in low-income countries. In low-income countries, bacterial meningitis has a mortality rate of up to 54%. Up to 24% of those who

survive develop chronic neurological sequelae, such as hearing loss or focal neurological deficits [7].
Bacterial meningitis is the most common dangerous type of meningitis and can be fatal within 24 hours [5]. Meningitis can affect people of any age. Before routine use of pneumococcal conjugate vaccine, bacterial meningitis affected almost 6000 people every year in the United States, and about half of all cases occurred in children 18 years old or younger. Prompt and accurate diagnosis and adequate treatment of bacterial meningitis in children remains a major challenge, as reflected by the continued high morbidity and case-fatality rates of the disease worldwide [4].
In the Kazakhstan Republic among children <14 year in 2015 compared to the year 2014 established decrease of BM from 5.52% to 4.49% for 100,000 population, while in other regions there is a consistent trend of increased morbidity. N. meningitidis was the most common bacteria, 70% of all cases, followed by pneumococcus, 10-15%. The highest incidence of BM in 2015, determined in Almaty 24.81%, in Astana 24.05%, but in comparison with the year 2014 these figures decreased to half. In the other regions of the country incidence rates, of disease was absent in 2014, Akmola (0.6%), West Kazakhstan (0.67%), Kyzylorda (1.27%), Mangystau (0.52%), and North Kazakhstan (1.73%). During 2015 a significant increase of incidence of BM was observed compared to 2014 year in Almaty region, from 0.75% to 6.18% [6].

Bacterial meningitis is caused by 50 different types of bacteria. Streptococcus pneumoniae, Neisseria meningitidis, Haemophilus influenzae, and Listeria monocytogenes are the major bacterial pathogens responsible for community-acquired meningitis in adults [9,10].
Streptococcus pneumoniae causes about 72% and Neisseria meningitidis causes about 11% of cases of bacterial meningitis in people older than 16 years. Escherichia coli and Streptococcus agalactiae cause about 35% of cases each of early-onset neonatal meningitis. In adults, risk factors for bacterial meningitis include older age and immunosuppressive conditions [7].
The bacteria most often responsible for bacterial meningitis are common in the environment. Some individuals ("carriers") have bacteria in or on their bodies that does not make them sick but can be spread to others and cause meningitis. Also bacterial meningitis can result from direct bacterial invasion, such as from an ear or sinus infection or skull fracture [8].
Bacterial meningitis is distinguished by the introduction of bacteria into the cerebrospinal fluid (CSF) and the subsequent proliferation of bacteria in this compartment, which leads to inflammation both within the CSF and in the brain tissue that is next to it [21]. Experimental evidence suggests that the choroid plexus may be a site of invasion [24]. Meningococci have been indentified both in the choroid plexus and within the meninges. These data suggest that several highly vascularized sites are potential entry locations. In order to cross the blood—brain or the blood—CSF barrier and to overcome sophisticated structures such as tight junctions, meningeal pathogens must carry effective molecular tools [11]. These tools are proteins on the bacteria's surface that help them stick to and enter cells . For example, Streptococcal proteins such as CbpA interact with glycoconjugate receptors of phosphorylcholine with platelet activating factor (PAF) on the eukaryotic cells and promote endocytosis and crossing the blood—brain barrier [25,26,27,28]. Meningococci's PilC1 adhesin interacts with CD46 and the outer membrane protein connects to vitronectin and integrins [11].
Inflammatory activation of endothelial cells seems to be a prerequisite for bacterial invasion but also results in the regulation of adhesion molecules as ICAM-1. Subsequently, these molecules promote the multistep process of leukocyte invasion. Leukocytes, in particular the presence of granulocytes in the CSF, are the diagnostic hallmark of meningitis. Early inflammatory response and bacterial invasion seem to progress in parallel and products of activated leukocytes such as MMPs (matrix metalloproteinases) and NO (nitric oxide) and others contribute to early damage of

the blood—brain and blood—CSF barrier. Once bacteria have entered the subarachnoidal space, they replicate, undergo autolysis and cause further inflammation.
Multiple cell types appear to be involved in the pathogenesis, with endothelial cells, perivascular macrophages and mast cells potentially playing a key role in the inflammatory response. Heat killed bacteria and pathogen-associated molecular patterns (PAMP) of meningitis pathogens as lipoprotein (LP), lipoteichoic acid (LTA), peptidoglycan (PG), and lipopolysaccarid (LPS) cause meningitis indistinguishable from living bacteria . Immune pattern recognition molecules as CD14 and LBP (lipopolysaccharide-binding protein) function as sensors in identifying PAMPs [30]. Pneumococcal PG and LP are recognized by TLR2 (Toll-like receptor 2) whereas LPS, and interestingly the pneumococcal toxin pneumolysin, signal through TLR4 [29]. After a TLR recognizes a pathogen, the signal is passed to MyD88 (an intracellular protein), which acts as an adapter to relay the signal further down inside the cell [11]. They induce the activation of NFκB or mitogen-activated protein kinase pathways and subsequently upregulate leukocyte populations and express numerous proteins involved in inflammation and the immune response. Many brain cells can produce cytokines, chemokines and other pro-inflammatory molecules in response to bacterial stimuli, and polymorphonuclear leukocytes are attracted, activated and released in large amounts of superoxide anion and nitric oxide, leading to peroxynitrite formation and generating oxidative stress. This cascade leads to lipid peroxidation, mitochondrial damage and breakdown of the blood-brain barrier, thus contributing to cell injury [16]. The increased intracranial pressure that results from this is a significant contributor to mortality during the acute phase and to long-term complications. Vasculitis, cerebral venous thrombosis, and secondary ischemia are among possible complications that can arise from systemic inflammation [19]. Up to 50% of survivors of bacterial meningitis suffer from disabling neuropsychological deficits. Clinically as well as experimentally, the hippo campus seems to be the most vulnerable area of the brain. Neuronal loss translates into hippocampal atro phy and has been reported on MRI scans in sur vivors of bacterial meningitis [11].

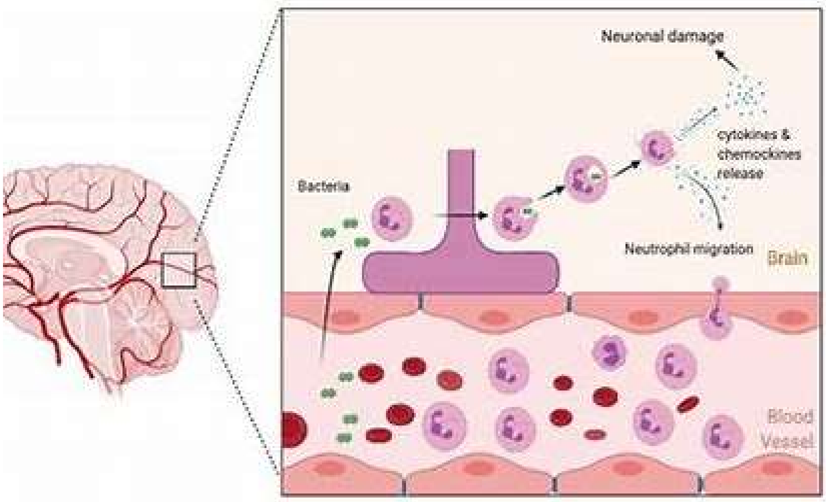

Figure 3. Pathophysiology of Neuronal Damage due to Bacterial Meningitis [22].

The most common symptoms are headache (84%), fever (74%), stiff neck (74%), altered mental status and nausea (62%) [7].

Although meningitis affects all ages, young children are most at risk. Newborn babies are at most risk from Group B streptococcus, young children are at higher risk from meningococcus, pneumococcus and Haemophilus influenzae. Adolescents and young adults are at particular risk of meningococcal disease while the elderly are at particular risk of pneumococcal disease [5]. Certain people (pregnant individuals, newborns, people aged 65 years or older, and immunocompromised patients) are at higher risk of developing meningitis from food contaminated with *Listeria* bacteria, which is sometimes found in unpasteurized dairy products or in contaminated produce [8]. Listeria (L.) monocytogenes is primarily transmitted via contaminated food and can cause listeriosis, an infection often associated with sepsis and meningitis in at-risk individuals [14].

Meningitis that is caused by bacteria is life-threatening at any age but is of special concern in newborns. Bacterial meningitis in newborns usually results from an infection of the blood (sepsis).

Sometimes bacterial meningitis occurs in newborns when the bacteria enter the body through cuts or punctures in the scalp. The cuts or punctures can be caused by instruments that are used for delivery or by probes that are stuck to the scalp [13].

Bacterial meningitis in the neonatal period is considered early when occurring during the first week of life and late when occurring between the second and sixth weeks [20]. In early neonatal meningitis the primary mode of infection is by vertical transmission (mother to child) through the birth canal, whereas in late neonatal meningitis transmission is nosocomial or horizontal (person to person). Early-onset infection is mainly maternal in origin because pregnancy and delivery expose the fetus/neonate to many pathogens that can be transmitted through the vagina to ruptured amniotic membranes or via contact with the neonate's skin during passage through the birth canal. Organisms such as *L. monocytogenes* can be transmitted through the placenta. Late-onset infection is mainly nosocomial, with foreign devices such as endotracheal tubes, catheters, and feeding tubes, increasing the risk of infection [2]. Neonatal meningitis leads to deafness, blindness, cerebral palsy, seizures, hydrocephalus or cognitive impairment in approximately 25-50 % of survivors [16].

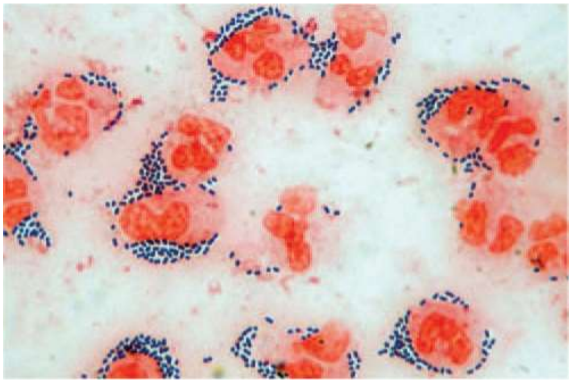

Figure 4. Diagnostic Gram stain of CSF from a patient with pneumococcal meningitis. Neutrophils (stained red) are surrounded by Gram-positive dipolcocci (stained blue).[11]

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Қатерлі ісік жағдайындағы өкпе тіндерінің морфологиялық өзгерістері

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Morphological changes in lung tissue in malignant tumor

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АННОТАЦИЯ

Өкпенің қатерлі ісігінің морфологиялық түрлері, даму сатылары, метастаздану механизмдері және патогенезі кеңінен сипатталады. Аденокарцинома, жалпақ жасушалы, ұсақ және ірі жасушалы ісіктердің гистологиялық ерекшеліктері талданады. Ісік жасушаларындағы мутациялар, ангиогенез, иммундық жүйемен байланыс, метастаз кезеңдері ғылыми негізде түсіндіріледі. Материал медицина студенттері мен онкология саласына қызығушылығы бар мамандар үшін маңызды ақпарат көзі бола алады.

ABSTRACK

Morphological types of lung cancer, tumor development stages, metastasis mechanisms, and pathogenesis are described in detail. A comparative analysis is presented for adenocarcinoma, squamous cell carcinoma, small-cell, and large-cell types. The paper highlights tumor cell mutations, angiogenesis, immune system interaction, and the sequential steps of metastasis. This content provides a valuable reference for medical students and professionals with an interest in oncology.

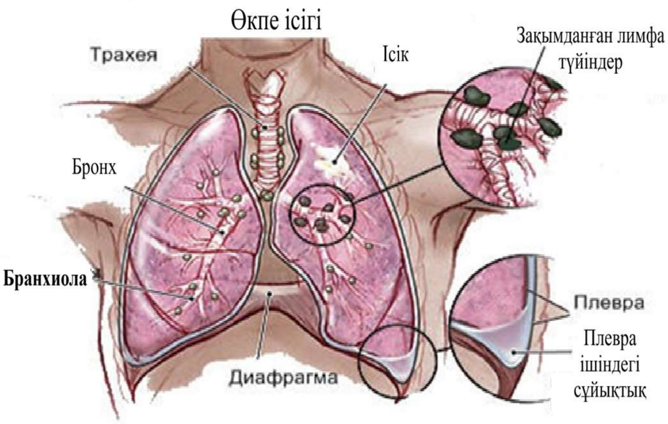
Кілт сөздер: өкпенің қатерлі ісігі, аденокарцинома, жалпақ жасушалы карцинома, ұсақжасушалы ісік, ірі жасушалы ісік, патогенез, метастаз, ангиогенез, мутация

Keywords: lung cancer, adenocarcinoma, squamous cell carcinoma, small-cell carcinoma, large-cell carcinomapathogenesis, metastasis, angiogenesis, mutation

Тақырыптың өзектілігі: Әрбір медицина студенті мен дәрігер өкпе қатерлі ісігін біледі, алайда оның нақты жіктелуі, патогенезі, клиникалық ерекшеліктері, гистологиялық өзгерістері мен молекулалық мутациялары туралы жинақталған мәліметтерді табу қиын. Бұл деректер көбіне онкология мен патоморфология салаларында шектеліп қалады, ал жалпы клиникалық әдебиетте толық қамтылмайды. Мысалы, өкпе аденокарциномасындағы EGFR мутациясы туралы мәліметтер Жапония мен Оңтүстік Кореядағы зерттеулерде келтірілсе, клиникалық сатылары мен метастаздану жиілігі жөніндегі ақпараттар NCI мен ESMO есептерінде ғана кездеседі.

Жұмыстың мақсаты: өкпе қатерлі ісігінің морфологиялық түрлерін, даму сатыларын, метастаздану механизмдерін және гистологиялық ерекшеліктерін талдау арқылы оның патогенезін жан-жақты сипаттау.

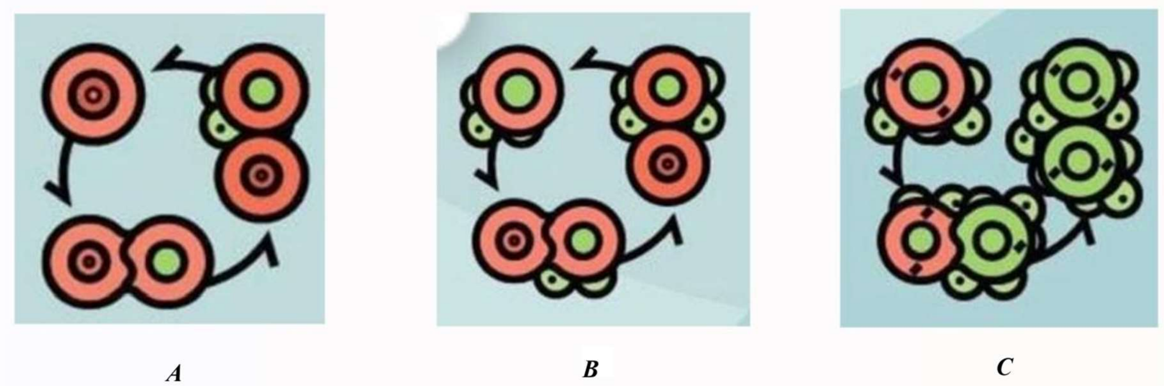
Зерттеу материалы. Өкпенің қатерлі ісігі – бұл альвеолалардан, бронхтардан немесе бронхиолалардан басталатын эпителиалды қатерлі ісік. Оның дамуында тек бір жасушаның атипиясы емес, бүкіл өкпе құрылымының бұзылуы, лимфа мен қан тамырлары арқылы таралуы және иммундық жауаптың өзгеруі байқалады [12, 18](сурет 1)



Сурет 1. Өкпенің қатерлі ісігінің жалпы көрінісі. (*https://gp5-taraz.kz/about/allnews/1797-chto-takoe-rak-legkikh?Template= accessibility*).

Аурудың алғашқы сипаттамалары “грудная жаба”, “өкпенің жаралы зақымдануы” сияқты түрлі атаулармен берілгенімен, қазіргі клиникалық практикада бұл патология «өкпенің қатерлі ісігі» (carcinoma pulmonis) деп ресми түрде бекітілген [1].

Өкпенің қатерлі ісігі – бұл бастапқыда бронх эпителийінен немесе альвеолярлы жасушалардан дамитын инвазивті ісік. Ең жиі кездесетін патогенезі — бронх эпителийіндегі дисплазия мен метаплазия процестерінен басталып, атипиялық жасушалардың бақылаусыз бөлінуіне әкеледі. Бұл жасушалар біртіндеп базалды мембрананы бұзып, шеміршекке, лимфа түйіндеріне және қан тамырларына енеді.



Сурет 2. Қатерлі ісік тіндерінің дамуы. А – инициация, В – промоция, С – прогрессия (https://taplink.cc./onko_doktor)

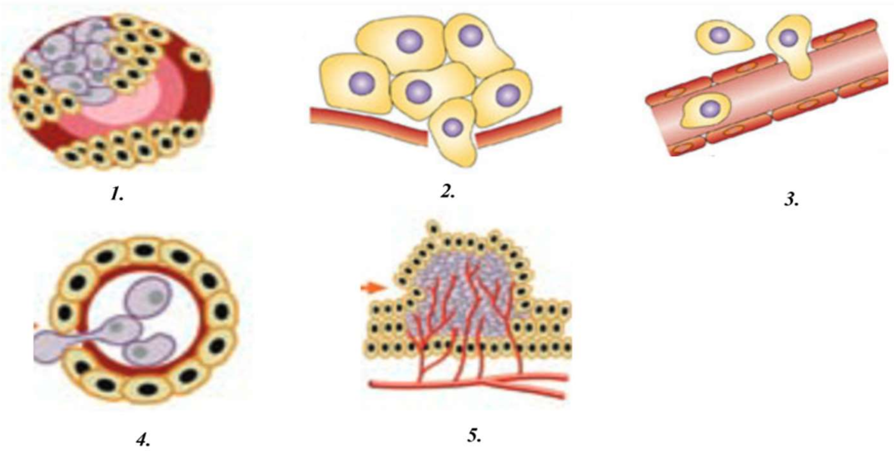
Қатерлі ісік тіндерінің дамуы – бұл қалыпты жасушалардың генетикалық мутацияларға ұшырап, бақылаусыз көбейе бастауынан туындайтын күрделі үдеріс. Бұл үдеріс бірнеше негізгі кезеңдер арқылы жүреді.

Бірінші кезеңде, яғни инициация кезеңінде (сурет 2А), ағзадағы қалыпты жасуша сыртқы немесе ішкі зиянды факторлардың әсерінен (мысалы, химиялық заттар, радиация, вирустар) ДНҚ құрылымында мутацияға ұшырайды. Бұл мутация көбінесе жасушаның бөлінуі мен өсуін реттейтін маңызды гендерге – онкогендер мен ісік супрессорларына әсер етеді. Салдарынан жасуша өз-өзіне тән қалыпты бақылаудан шығады.

Екінші кезеңде, яғни промоция кезеңінде (сурет 2В), мутацияланған жасушалар түрлі қозғаушы факторлардың әсерінен (мысалы, темекі түтіні, гормоналды бұзылыстар, қабыну процестері) белсенді көбейе бастайды. Бұл жасушалар сау жасушаларға қарағанда ағзаның бақылауына бағынбайды, олардың көбеюі реттелмейді. Бұл сатыда ісіктің негізі қаланады.

Үшінші кезеңде, яғни прогрессия кезеңінде (сурет 2С), жасушаларда қосымша мутациялар жинақталып, ісік неғұрлым агрессивті сипат ала бастайды. Қатерлі жасушалар айналасындағы тіндерге еніп (инвазия жасап), олардың құрылымын бұзады. Сонымен қатар, олар өздерінің қанмен және қоректік заттармен қамтамасыз етілуі үшін жаңа қан тамырларын түзе бастайды – бұл үдеріс ангиогенез деп аталады [2].

Ісік дамуының ең қауіпті әрі соңғы сатысы – метастаздану деп аталады. Бұл кезде ісік жасушалары бастапқы орналасқан орнынан алыс мүшелерге таралып, жаңа қатерлі ошақтар қалыптастырады. Метастаз бірнеше кезеңнен тұрады:



Сурет 3. Метастаздану кезеңдері. 1 – инвазия, 2 – интравазация, 3 – циркуляция, 4 – экстравазация, 5 – ангиогенез. (https://zaborovskii.github.io/post/spinal-tumors-basics/).

Бірінші метастаздық кезеңде, яғни инвазия кезеңінде (сурет 3.1), ісік жасушалары бастапқы ошақтан айналасындағы сау тіндерге өтіп, олардың арасына енеді. Бұл үшін олар жасушааралық байланыстарды әлсіретіп, арнайы ферменттер бөледі. Жасушалар қозғалғыштық қабілетке ие болып, инвазиялық қасиет көрсетеді.

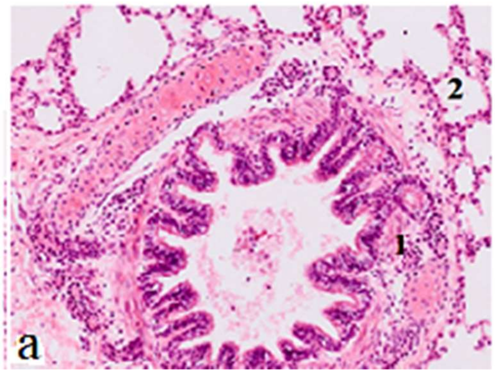
Екінші кезеңде, яғни интравазация кезеңінде (сурет 3.2), ісік жасушалары қан немесе лимфа тамырларының ішіне өтеді. Олар қан тамырларының ішкі қабатын бұзып, айналымға енеді. Иммундық жүйеден жасырыну үшін бұл жасушалар тромбоциттермен жабылады.

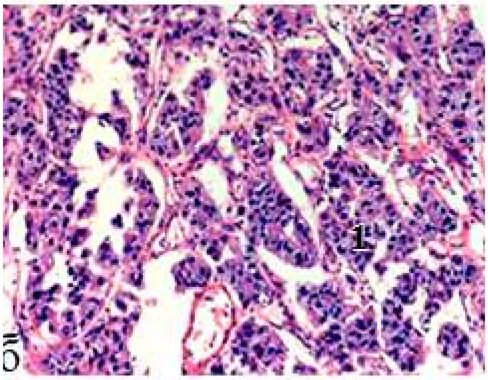
Үшінші кезеңде, яғни циркуляция кезеңінде (сурет 3.3), ісік жасушалары қанмен немесе лимфамен ағза ішінде еркін қозғалады. Бұл кезде көптеген жасушалар жойылады, тек ең төзімді және мутацияланған жасушалар ғана тірі қалады. Олар басқа мүшелерге жетіп, тоқтауға дайын болады.

Төртінші кезеңде, яғни экстравазация кезеңінде (сурет 3.4), тірі қалған ісік жасушалары жаңа тіндерге жабысып, капиллярлардан шығып, сыртқы ортаға өтеді. Олар ферменттер арқылы тіндерге енеді және жаңа ортаға бейімделе бастайды.

Бесінші және соңғы кезеңде, яғни метастаздың өсу және ангиогенез кезеңінде (сурет 3.5), ісік жасушалары жаңа ортада белсенді көбейе бастайды. Олар қан тамырларын қалыптастырып, өз өмір сүруін жалғастыру үшін қажетті қоректік заттар мен оттегін алады. Осылайша, бастапқы ісіктен тәуелсіз екінші қатерлі ісік ошағы түзіледі.

Бұл кезеңдердің барлығы қатерлі ісіктің неге агрессивті және емдеуге қиын екенін түсіндіреді. Әрбір сатыны зерттеу – тиімді алдын алу, ерте диагностика және дұрыс емдеу тәсілдерін әзірлеуге негіз болады [3].





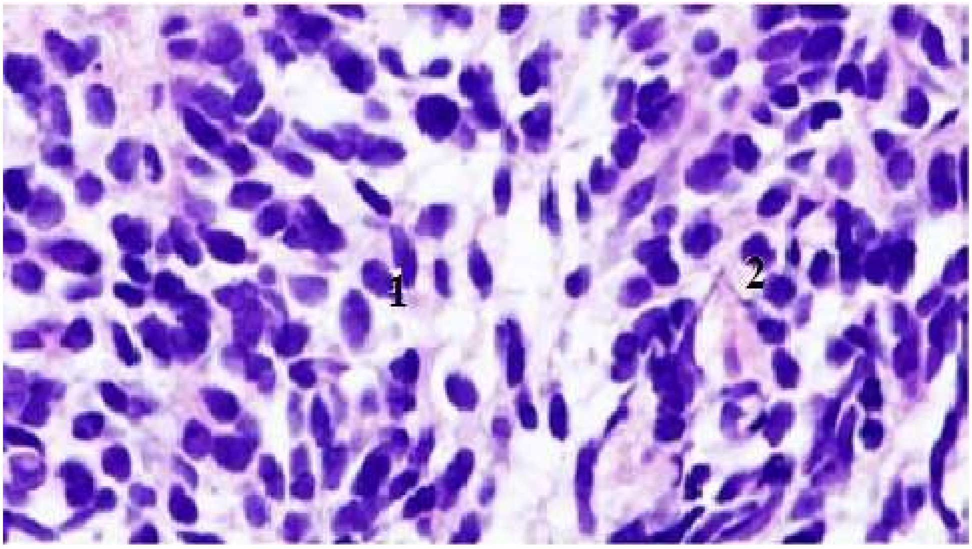
Сурет 4. Қалыпты өкпе(а)
1 – бронх; 2 – альвеола
Гематоксилин-эозин.
(https://integramed.ru/pulmonology/raklegkih/, авторлардың толықтырылуымен).

Өкпенің қатерлі ісік тінінің **аймағы(б).** 1 – полиморфты жасушалар.
Гематоксилин-эозин.
(https://studfile.net/preview/16858541/, авторлардың толықтырылуымен).

Қалыпты өкпе тіні жасушалары тәртіппен орналасып, біркелкі пішінді және ядросы кіші болады (сурет 4а). Ал қатерлі ісік тінінде, керісінше, жасушалар атипиялық, пішіні мен мөлшері әртүрлі, ядросы үлкейген және бақылаусыз көбейеді (сурет 4б). Сонымен қатар, қалыпты тіндер организмнің қажеттілігіне байланысты ғана көбейсе, ісік жасушалары айналасындағы тіндерге ене отырып (инвазия), шексіз бөлінуге бейім. Қалыпты өкпе тіні қалыпты қан тамырлары жүйесімен қамтамасыз етілген. Ал ісік тіні, өз кезегінде, жаңа қан тамырларын (ангиогенез) дамытып, өздігінен қоректену қабілетіне ие болады. Функция жағынан алып қарасақ, қалыпты тін оттегі мен көмірқышқыл газ алмасуын қамтамасыз етсе, қатерлі ісік бұл тыныс алу қызметін бұзады. Сонымен қоса, қалыпты жасушаларда ДНҚ зақымданғанда апоптоз (өзін-өзі жою) іске қосылады. Ал ісік жасушалары бұл механизмнен қашып, шексіз бөлінеді. Метастаз тұрғысынан, қалыпты тіндер ешқайда таралмайды, ал қатерлі ісік жасушалары лимфа және қан арқылы басқа мүшелерге таралуы мүмкін.Энергия алмасуда да айырмашылық бар: қалыпты жасушалар аэробты тыныс алумен энергия өндірсе, ісік жасушалары анаэробты гликолизге (Варбург эффектісі) бейім, яғни жылдам әрі тиімсіз жолмен энергия алады. Жасушааралық байланыс қалыпты тінде тығыз және берік болғанымен, ісік жасушаларында бұл байланыс әлсіз немесе мүлде жоқ, сондықтан олар оңай ажырап, тез таралады.Бұдан бөлек, қалыпты тінде қабыну реакциясы болмайды немесе физиологиялық деңгейде өтеді. Ал ісікте созылмалы қабыну жиі байқалып, оның дамуына ықпал етуі мүмкін.Иммундық жүйе қалыпты жасушаларды үнемі бақылап отырады. Керісінше, ісік жасушалары иммундық жүйеден жасырынып, тіпті оны басып тастай алады. Сондай-ақ, қалыпты жасушалар генетикалық тұрақты болса, ісік жасушаларында мутациялар мен хромосомалық ауытқулар жиі кездеседі [4].

Ұсақ жасушалы қатерлі ісік (сурет 5) – өкпенің ең агрессивті ісік түрлерінің бірі болып табылады. Бұл ісік өзінің нейроэндокриндік шығу тегімен ерекшеленеді және өте жылдам өсу мен ерте метастаздануға бейім.

Гистологиялық зерттеу барысында ұсақ жасушалы ісікке тән бірнеше айқын белгілер анықталады.



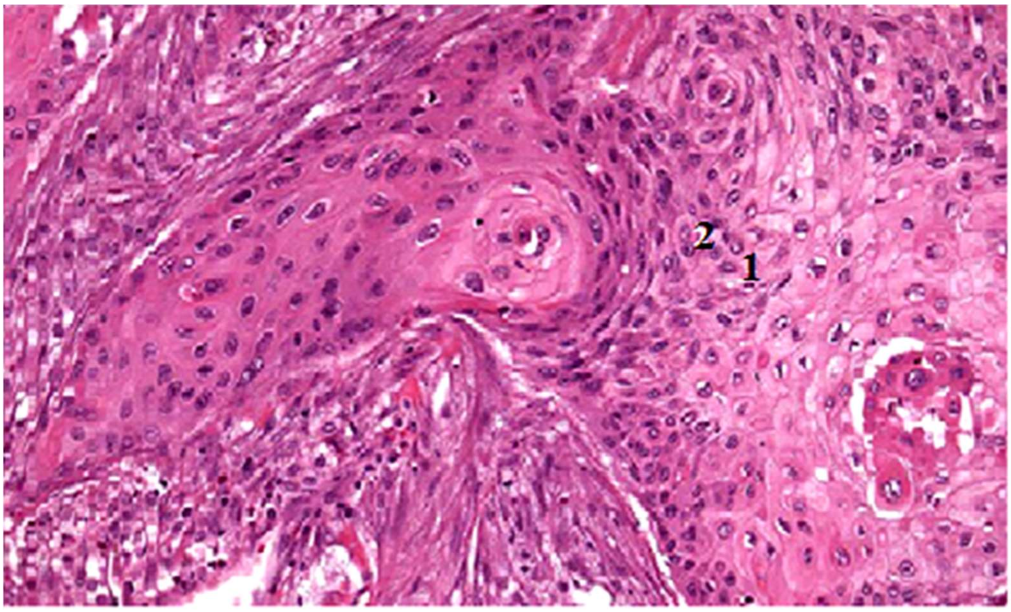
Сурет 5. Өкпе. Ұсақ жасушалы қатерлі ісік. 1 – сопақша пішінді жасушалар; 2 – дөңгелек пішінді жасушалар. Гематоксилин-эозин. (https://meduniver.com/Medical/gistologia/364.html, авторлардың толықт-ен)

Алдымен, ісіктік жасушаларға тоқталсақ, олар өте ұсақ, пішіні жағынан дөңгелек (сурет 5.2) немесе сопақша (сурет 5.1) болып келеді. Жасушалардың ядролары қою боялған (гиперхромды), ал цитоплазмасы өте жұқа және аз мөлшерде көрінеді. Осыған байланысты бұл ісіктің жасушалары көбінесе «сұлы тәрізді» деп сипатталады – яғни ұзынша немесе дөңгелек ядросы бар, цитоплазмасы жұқа жасушалар. Сонымен қатар, полиморфты ұсақ жасушалы түрі де кездеседі. Мұндай түрінде жасушалар өлшемі мен пішіні жағынан әртүрлі болып келеді, атипиялық өзгерістер айқын байқалады. Бұл ісікке жоғары митоздық белсенділік тән – жасушалар қарқынды бөлінеді. Гистологиялық препаратта некроз ошақтары жиі анықталады.Ұсақ жасушалы қатерлі ісіктің тағы бір ерекшелігі – оның нейроэндокриндік сипаттамалары. Бұл ісік хромогранин А, синаптофизин, CD56 сияқты маркерлерге оң иммуногистохимиялық реакция береді. Кей жағдайларда ісік жасушалары розеткалық немесе трабекулярлы құрылымдар түзе алады – бұл да нейроэндокриндік ісіктерге тән морфологиялық көрініс.

Ісік құрамындағы строма (дәнекер тін) өте аз болады, ал ісік жасушалары бір-бірінің үстіне қабаттасып орналасады. Ісікте қан тамырлары көп, бірақ олар жиі зақымдалып, ішкі қан кетулерге алып келеді. Сонымен қатар, ісік маңында лимфоциттік инфильтрация, яғни иммундық жасушалардың жинақталуы байқалуы мүмкін [6].

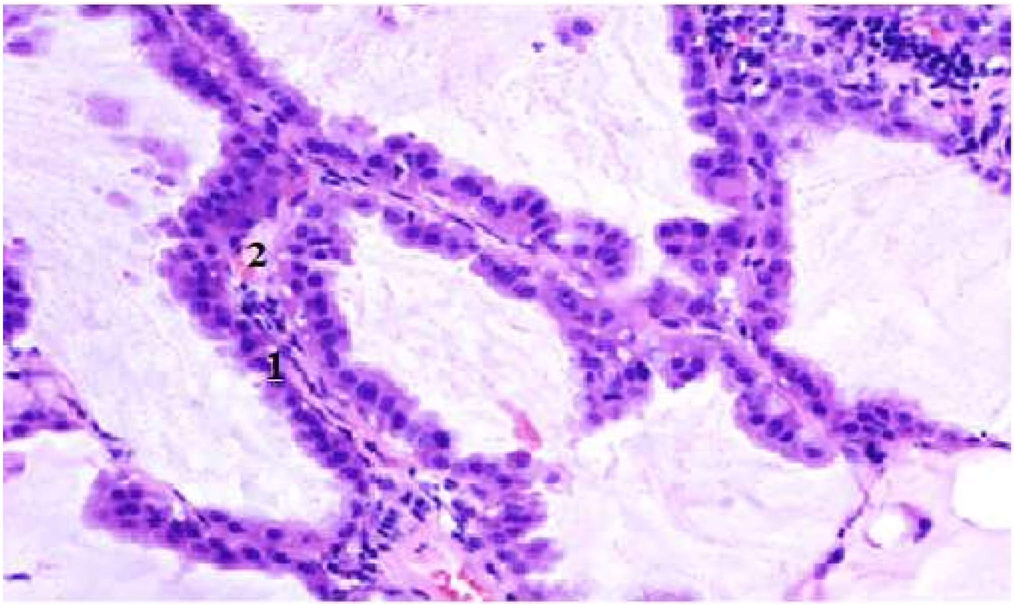
Ірі жасушалы қатерлі ісік (сурет 6) — бұл өкпеде сирек кездесетін, нашар дифференцияланған, агрессивті ағыммен сипатталатын эпителиальді қатерлі ісік түрі. Ол гистологиялық құрылымы жағынан аденокарциномаға да, жалпақ жасушалы карциномаға да жатпайды, бірақ эпителий тектес қатерлі ісік ретінде қарастырылады. Гистологиялық зерттеу барысында бұл ісікке тән бірнеше негізгі белгілер анықталады. Алдымен, ісіктік жасушалар ірі көлемімен ерекшеленеді. Олар дөңгелек немесе көпбұрышты пішінді (сурет 6.1), цитоплазмасы кең, ал ядро мен цитоплазма арақатынасы салыстырмалы түрде теңгерімді. Жасушаларда ірі, қою боялған (гиперхромды) ядролар және айқын көрінетін ядрошықтар болады. Бұл – ісіктің жоғары ядролық белсенділігін көрсететін белгі.Бұл ісік дифференциация деңгейі бойынша төмен немесе нашар дифференцияланған болып саналады. Яғни, ісік жасушаларының құрылымында аденокарциномаға тән бездік белгілер де, жалпақ жасушалы карциномаға тән кератин түзілімдері де кездеспейді. Осы себепті, ірі жасушалы қатерлі ісік — өз алдына бөлек морфологиялық түр ретінде жіктеледі.

Сонымен қатар, бұл ісікте митоздық белсенділік (сурет 6.2) өте жоғары, яғни ісік жасушалары тез және белсенді бөлінеді. Бұл оның агрессивті сипатын дәлелдейді. Сонымен бірге, некроз ошақтары жиі кездесіп, ісіктің ішінде өлі тін аймақтарының пайда болуына әкеледі [7].



Сурет 6. Өкпе. Ірі жасушалы ісік. 1 – көпбұрышты пішінді жасуша; 2 – жасушаның митозы. Гематоксилин-эозин. (*https://oncocenter-ichilov.com/lechenie-raka-legkih-v-izraile/vidy/*, авторлардың толықтырылуымен).

Бронхиолоальвеолярлы қатерлі ісік (БАҚ) (сурет 7) – бұл өкпенің ерекше қатерлі ісіктерінің бірі. Бұрын ол өкпе аденокарциномасының бір түрі ретінде қарастырылғанымен, қазіргі морфологиялық жіктеу бойынша ол липидикалық аденокарцинома деп аталады. Бұл ісік альвеола қабырғаларының бойымен таралуымен, бірақ стромаға, қан тамырларына(сурет 7.2) немесе плевраға инвазия жасамауымен ерекшеленеді. Инвазия болмаған жағдайда ол инвазивті ісікке жатпайды, ал егер инвазиялық өсу байқалса, онда бұл түрі инвазивті аденокарцинома болып есептеледі. Гистологиялық зерттеу барысында ісіктік жасушалардың бір қабатты бағаналы немесе куб тәрізді эпителий жасушаларынан (сурет 7.1) тұратыны анықталады.



Сурет 7. Өкпе. Бронхиолоальвеолярлы қатерлі ісік (БАҚ). 1 – текше тәрізді жасушалар; 2 – қантамыр. Гематоксилин-эозин. (*https://ru.m.wikipedia.org*, автор-дың толықтырылуымен).

Бұл жасушалар альвеолалардың ішкі қабырғаларының бойымен қатарласа орналасады, бұл өсу типі лепидикалық өсу деп аталады. Яғни, ісік тіні альвеолярлы құрылымды бұзбай, соның бойымен жайылады. Бұл – оның инвазивті емес сипатын көрсететін морфологиялық ерекшелік. Бронхиолоальвеолярлы қатерлі ісіктің муцин түзетін және муцин түзбейтін формалары кездеседі. Яғни, кейбір ісік жасушалары шырыш (муцин) бөледі, ал кейбіреулерінде мұндай қасиет байқалмайды.

Зерттеу нәтижелері: Өкпенің қатерлі ісігі — бұл экзогенді (темекі түтіні, ауаның ластануы, иондаушы радиация, кәсіптік зиянды факторлар) және эндогенді (тұқымқуалаушылық, гормондық өзгерістер, созылмалы қабыну процестері) факторлардың әсерінен дамитын қатерлі аурулардың бір түрі.Ісік көбінесе альвеолалар, бронх эпителийі, бронхиолалар аймағында дамиды және өкпе тінінің қалыпты құрылымын бұза отырып, айналасындағы қан тамырлары, лимфа жүйесі, плевра, жұмсақ тіндерге, ал кеш сатысында басқа мүшелерге де әсер етеді [8].

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Legal Sciences

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FEATURES RELEASE OF MINORS FROM CRIMINAL RESPONSIBILITY AND PUNISHMENT

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Abstract. The article discusses the features of the release of minors from criminal liability and punishment under the legislation of the Republic of Kazakhstan. The also disclosed the content of the legality requirement for such a decision, a detailed analysis of the elements of this content.

Keywords: criminal law, crime, juvenile, criminal liability, punishments, exemptions from criminal liability and punishment.

One of the most important issues in modern legal literature is the problem of exemption from criminal responsibility and punishment for the crime committed.

There are many factors influencing the determination of criminal responsibility. But the most important among them are the age and psychological characteristics of minors, so it is quite right that the Criminal Law has allocated a separate (VI) section of criminal responsibility of minors.

The Criminal Code of the Republic of Kazakhstan first of all defines the age of criminal responsibility. Minors covered by the articles of this section are persons who, at the time of committing a crime, have attained the age of fourteen years but have not attained the age of eighteen years (Art. 80, para. 1). A person is considered to have reached a certain age not on the day of his or her birth, but on the following day.

In considering the issue of the age of criminal responsibility, it was pointed out that the general age of criminal responsibility is set by law at sixteen. However, for a number of serious crimes, criminal responsibility is established from the age of fourteen.

At the same time, Article 15 of Part 3 of the Criminal Code of the RK warns that if a minor has reached the age of criminal responsibility, but due to mental retardation, not related to mental disorder, at the time of committing a crime of minor gravity could not fully realize the nature and public danger of his actions (inactions) or direct them, he shall not be subject to criminal responsibility [1].

The Criminal Code of the Republic of Kazakhstan on punishment emphasizes two features in relation to juveniles. The first is that not all types of punishment are imposed on juvenile offenders. Thus, article 81 of the Criminal Code indicates that the types of punishment imposed on juveniles may be fines, deprivation of the right to engage in certain activities, community service, corrective work, restriction of liberty and imprisonment. The second peculiarity of criminal punishment of minors is that the above-mentioned types of punishment are limited in nature.

For example, a fine is imposed only if the juvenile offender has independent income or property that can be seized.

Such punishment as deprivation of the right to engage in certain activities is imposed on minors for a period of one to two years.

Attraction to public works is appointed for the term from forty to fifty hours, consists in performance of works, feasible for a minor, and shall be executed by him in free from study or basic work time. Duration of execution of the given kind of punishment by persons in the age till sixteen years can not exceed two hours a day, and by persons in the age from sixteen till eighteen years - three hours a day.

Restriction of liberty is imposed on juveniles for up to two years. Deprivation of liberty also has a number of peculiarities in its application to juveniles.

As a rule, criminal liability is implemented in the punishment imposed by the court on the persons guilty of committing a crime. However, in some cases it is possible to achieve the goals of the fight against crime without imposing criminal liability or convicting the persons guilty of committing a crime, but by releasing them from serving the sentence, or by releasing them early from serving the sentence, or by replacing the part of the sentence not served by another, more lenient, punishment.

The purpose of criminal punishment is not to retaliate against the offender. Its main purpose is to correct, re-educate the criminal, to prevent him from committing new crimes. If it is not necessary to apply very strict measures of criminal-legal influence in order to achieve these humane goals, the law provides for the possibility of mitigating the fate of the convicted person up to his complete release from punishment. Release from punishment is understood as the refusal of the state to apply the punishments provided by the criminal law to a guilty person.

The reasons for such an exemption vary. In particular, it is allowed if the convicted person has been reformed and re-educated, and therefore the goals of the punishment can be achieved without its actual execution, or if there are other circumstances indicating the inappropriateness of applying the punishment to him (for example, a serious illness).

Release of the convicted person from serving the sentence, as well as mitigation of the imposed sentence, except for release or mitigation of the sentence by amnesty or pardon, can be applied by the court only in the cases and in the order specified by the law.

The legal nature of immunity from criminal responsibility is closely related to criminal responsibility itself.

Therefore, on the one hand, the theoretical solution of the question of the concept, nature and content of criminal responsibility serves as a basis for the solution of the question of the nature of exemption from criminal responsibility. On the other hand, the legislative solution of the questions of exemption from criminal responsibility is the material on which we can find out the legislator's opinion about the content of criminal responsibility, the stages of its implementation.

The process of identifying the legal nature of immunity from criminal responsibility is complicated by the lack of a unified point of view on the issue of criminal responsibility and its nature.

There are two main tendencies in the approach to this problem. Proponents of the first position solve the problem in the key of identifying criminal responsibility with punishment and, accordingly, exemption from criminal responsibility with exemption from punishment. The second position is based on the concept of criminal responsibility, as well as other adverse consequences established by law for the person who committed the crime. And exemption from criminal responsibility is not reduced to exemption from punishment and includes exemption from other adverse consequences, such as conviction [2, 40].

There are many supporters of one or the other point of view. Such scientists as E.I. Kairzhanov, U.S. Dzhekebayev believe that "criminal responsibility - the obligation of a guilty person to suffer all unprofitable consequences established by law of the committed crime" [5;6;7]. Others (V.N. Kudryavtsev) adhere to another formulation - criminal responsibility - the suffering of punishment [3,18].

We adhere to the first view. That is, we believe that criminal responsibility is not limited to receiving punishment.

First, if we accept a different point of view, then we would have to admit that the criminal law distinguishes between the concepts of exemption from criminal responsibility and exemption from punishment, and that this distinction is not justified.

Second, it should be recognized that it does not matter at what stage the release from criminal liability occurs. On the basis of criminal and criminal procedural law, however, there is reason to argue that the legal meaning and legal consequences are not at all the same when a person is released from criminal liability before being brought as an accused, after being brought as an accused, before being tried or sentenced, released from serving the sentence after being sentenced, released from further serving the sentence. The scope of coercive measures applied to a person in all these cases is different.

Thirdly, exemption from the imposition of punishment is possible only if the person has already undergone it, if the punishment has already been applied, executed. That is, in this case we should talk about the facts when the person sentenced to imprisonment, for example, has already been deprived of it.

That is, in our view, immunity from criminal responsibility is not immunity from punishment, but immunity from punishment.

It may be argued that a perpetrator who is not held criminally accountable suffers no other disadvantage than the fear of possible retribution. And that this state of affairs undermines the very meaning of the duty to answer for a crime.

However, it is thought that this duty should not be considered in the non-standard version if the perpetrator evades justice. In general, this duty in the normal version is transformed into undergoing punishment. And this process is nothing but the development and realization of the duty to undergo punishment.

So the obligation to answer for what has been done must be fulfilled, and that is what the organs of justice are for. And the fact that they often do not bring the perpetrator to justice undermines the authority of these bodies, but not the criminal law.

What is meant by "immunity", the concept of "immunity" implies that there are already some limitations. Immunity from criminal responsibility applies only to a person who has committed a crime and must answer for it. Accordingly, relief from responsibility means that the person is relieved of those responsibilities that were incumbent upon him or her. Responsibility means an obligation, a necessity to answer for something.

If a person does not have to answer, then he does not need to be exempted from liability. If a person has not committed a crime, he does not need to be exempted from criminal liability. In this case, it is more correct to say that "the person is not subject to criminal liability. Accordingly, a person who has committed a crime is subject to criminal liability, and a person who has not committed a crime is not subject to criminal liability.

Some scientists (V.D. Filimonov, S.G. Kelina) emphasize that in order to exempt a person from criminal responsibility it is necessary to first establish the corpus delicti in the actions of a person. According to V.D. Filimonov, "the existence of various types of exemptions from criminal liability in our legislation does not mean that if at least some of them are applied, there are no grounds for criminal liability. On the contrary, their existence is a proof of the existence of such grounds. If there were no grounds for criminal responsibility, it would be inconceivable to raise the question of exemption from such responsibility. After all, we do not raise the question of exemption from criminal responsibility in cases of necessary defense or extreme necessity, not because in these cases there are no grounds for criminal responsibility, or in other words, the corpus delicti. [8,98].

A minor who has for the first time committed a crime of minor or medium gravity may be exempted from criminal responsibility if it is recognized that his correction can be achieved through the use of compulsory measures of educational influence.

The Criminal Code of the Republic of Kazakhstan provides for the following types of coercive measures of educational influence:

a) warning;

b) placement under the supervision of parents or persons in loco parentis or a specialized state body;

c) imposition of an obligation to compensate for the damage caused

d) Restriction of the minor's free time and establishment of special requirements for his behavior

e) placement in a special educational or therapeutic institution for minors.

Placement under supervision consists in imposing on parents or persons in loco parentis, or a specialized state body, the obligation to educate the minor and monitor his or her behavior. When this coercive measure is applied, the parents are restricted in the way of fulfilling this obligation: the parent's duty is specified and he or she is assigned, for example, to ensure control over the child's free time, not to allow the child to leave the house after a certain hour, etc. This measure is a kind of warning to parents and other persons. This measure is a kind of warning to parents and other persons about the possibility of making their child (ward) responsible, in order to encourage them to be more active in educational activities [4,98]. In cases where parents and other persons do not agree to assume the duty of supervision or are unable to fulfill this duty properly, a specialized state body is preferred.

The obligation to compensate for the damage caused is determined taking into account the minor's property status and working capacity. Civil law provides for monetary compensation for moral damage, but in some cases, with the victim's consent, moral damage may be compensated by an apology from the offender.

Restriction of free time and establishment of special requirements for the minor's behavior may provide for prohibition of visiting certain places, using certain forms of free time, including those connected with driving a motor vehicle, restriction of staying outside the house after a certain time of the day, departure to other areas without the permission of a specialized state body. A minor may be required to return to an institution of general education or to seek employment with the help of a specialized state body. Other requirements necessary for the minor's rehabilitation may also be imposed. Such requirements shall be reasonable, shall not be cruel, shall not cause harm to the minor and shall not be aimed at destroying the minor's dignity.

Since compulsory measures of educational influence are not divided into basic and additional, several measures of educational nature can be appointed to a minor at the same time.

The system of compulsory measures of educational influence provided by the law creates the basis for applying to minors exemption from criminal liability and punishment with the application of compulsory measures of educational influence. The basis for the application of compulsory measures of educational influence is the commission of a crime of low and medium gravity by a minor for the first time, the possibility of achieving correction through the application of compulsory measures of educational influence.

As a general rule, the fact that a person has committed a crime can be established only by a final court decision. Since in this case an exception to the general principle is allowed, special attention is paid to establishing the fact of the commission of a crime. It is inappropriate to apply this measure to a person who has not admitted his guilt of committing a crime, and it should be taken into account that a confession, like any other evidence, must be evaluated critically. A minor may have valid reasons for self-incrimination (e.g., fear of criminal punishment or of the actual perpetrator).

The possibility of correction of a minor may be determined on the basis of the nature and degree of danger of this particular crime, the personality of the perpetrator, the conditions of his life and upbringing, and other circumstances of the case.

The Criminal Code of the Republic of Kazakhstan [1] provides a norm on the release of a minor from punishment with the application of coercive measures of educational influence.

The Criminal Code of the Republic of Kazakhstan also provides for the possibility of placing a minor in a special educational or therapeutic-educational institution for minors. This measure is also a coercive measure of educational influence. Article 85 of the Criminal Code provides for a special procedure and grounds for applying this measure.

The stay in special educational and therapeutic-educational institutions may be terminated before the expiration of the term (the maximum period of punishment), when a person reaches the age of majority, if, according to the conclusion of a specialized state body providing correction, the minor no longer needs further application of this measure for his correction. Prolongation of a minor's stay in a special institution after the expiration of the term is allowed only if it is necessary to complete general education or vocational training [5, 90].

The commission of a crime by a person, from which he was exempted from punishment according to the Criminal Code of the RK, does not result in the criminal record of a minor and cannot be taken into account in the allocation of punishment and in the qualification in case of committing a new crime, but the fact of committing a crime after being exempted from punishment by the CC is a circumstance characterizing the personality of the criminal, and the personality is taken into account both in the allocation of punishment and in deciding whether and how to exempt a person from criminal liability or punishment.

Both special types of exemption from criminal responsibility and punishment and general types of exemption from criminal responsibility and punishment of minors are applied to minors.

A minor may be released from criminal liability under the general rules in connection with active repentance, in connection with reconciliation with the victim (in connection with a change of circumstances, due to the expiration of the statute of limitations).

A minor may be exempted from punishment under the general rules of parole, exemption from punishment due to illness.

Conditional sentencing is appropriate for adults and juveniles who committed a crime before reaching the age of majority, if the court, after imposing a sentence of imprisonment or correctional labor, concludes that the convicted person can be corrected without serving the sentence.

The Criminal Code of the Russian Federation provides for reduced terms of imprisonment, after serving which a minor may be released on parole. Juveniles sentenced to correctional work or imprisonment may be released on parole after serving

(a) not less than one-third of the sentence imposed by the court for a minor or medium crime

(b) at least half of the sentence imposed for a serious crime;

(c) not less than two-thirds of the sentence imposed by the court for a particularly serious crime.

The general norms on the grounds for application of parole (the Criminal Code of the RK, which states: "A person serving a sentence of correctional work, restriction of military service, restriction of liberty, maintenance in a disciplinary military unit or deprivation of liberty may be released on parole if the court recognizes that for his correction he does not need to serve the full sentence imposed by the court" [4, 99]. At the same time, the person may be fully or partially released from serving an additional type of punishment), on the imposition of certain responsibilities on the parolee, on the mandatory minimum period of serving the sentence and on the application of parole to persons previously released on parole (paragraph "c" of Part Three), on the control over the parolee's conduct, on the cancellation of the parole and on the imposition of punishment in case of committing a new crime by the parolee.

According to the Criminal Code, the statute of limitations for the release of minors from criminal responsibility or punishment is reduced by half. Since the death penalty and life imprisonment are not applicable to juveniles, the maximum limitation period for juvenile criminal liability is 7.5 years. The expiry of the statute of limitations provided for in the foregoing articles in respect of a minor shall not prevent the institution of criminal proceedings in respect of the commission of an offence and the taking of the necessary measures to establish the truth in the case, in particular the possible involvement of adults in the offence.

Reduced limitation periods provided for by the Criminal Code of the RK may be applied to persons between 18 and 20 years of age if there are grounds for doing so. In this case, the court must take into account that the crime was committed by a person who, due to his young age, is mentally and socially immature.

When imposing punishment on a minor, in addition to the generally recognized mitigating circumstances, the conditions of his life and upbringing, the level of his mental development, other features of his personality, as well as the influence of older persons on him shall be taken into consideration.

The minor's age as a mitigating circumstance shall be considered in conjunction with other mitigating and aggravating circumstances.

In addition, a minor who has been convicted for the first time of a crime of minor or medium gravity may be exempted from punishment by the court if it is established that his correction can be achieved through the use of coercive measures of educational influence.

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Philological Sciences

Lexical-semantic analysis of cosmonyms, hydronyms, toponyms, and phytonym-component phraseological units in French and Azerbaijani languages

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Abstract: This article presents a lexical-semantic analysis of cosmonyms, hydronyms, toponyms, and phytonym-component phraseological units in French and Azerbaijani languages. The primary objective is to investigate the semantic structure and lexical implications of these linguistic units, revealing how their meanings are constructed and how they reflect the cultural, historical, and geographical contexts of both linguistic communities. The study elucidates the intricate ways in which both nations conceptualize and articulate their relationship with the cosmos, natural environment, and cultural values through their respective lexical systems. By focusing on the interplay between lexical items and their semantic extensions within these specific categories, the analysis provides deeper insights into cross-linguistic conceptualizations.

Keywords: lexical semantics, cosmonyms, hydronyms, toponyms, phytonyms, phraseological units, French language, Azerbaijani language, comparative linguistics, onomastics

Language is a complex system that encapsulates a nation's collective memory, cultural heritage, and its dialectical relationship with the environment (Crystal, 2008). Each language possesses unique naming systems that allow for the distinct labeling of geographical features, celestial bodies, and natural phenomena. These naming systems are a rich source for understanding a people's relationship with nature, mythology, and history. The primary aim of this article is to analyze cosmonyms (names of celestial bodies), hydronyms (names of water bodies), toponyms (place names), and flora-related phraseological units in French and Azerbaijani languages from comparative linguistic perspectives. Through this analysis, the cultural and historical influences that shaped both languages, as well as the perspectives of these nations on nature, will be explored. The research seeks to contribute to the development of comparative linguistics by identifying both structural and semantic similarities and differences (Dirinçəli, 2011).

Cosmonyms: Naming the heavens and mythological roots

Cosmonyms are linguistic units that reflect humanity's perception of the universe and its attempts to comprehend it. Their lexical-semantic properties often derive from ancient mythologies, religious beliefs, and early astronomical observations, reflecting a blend of scientific and cultural conceptualizations. They are often closely linked to ancient mythology, religious beliefs, and scientific observations. In both French and Azerbaijani languages, alongside certain universal international influences, distinct cultural and mythological approaches in naming celestial bodies are observed. In French, the names of planets primarily originate from Roman mythology. For example, names such as Mars (god of war), Vénus (goddess of love), Jupiter (king of the gods), and

Saturne (god of agriculture) underscore the close connection of Western civilization with ancient Roman culture. This reflects the Latin roots of the French language and its European cultural heritage (Dubois et al., 2002). The names of constellations (e.g., Grande Ourse – Big Dipper/Ursa Major, Petite Ourse – Little Dipper/Ursa Minor, Voie Lactée – Milky Way) are also based on Ancient Greek and Roman mythology or observable geographical features. These cosmonyms indicate the presence of ancient mythological concepts in French culture alongside a rational scientific approach. While international terms are also used for planets and some stars in Azerbaijani (Mars – Venus– Jupiter), older and more original folk names are also prevalent. For instance, the Big Dipper constellation is popularly known as "Yeddi qardaş" (Seven Brothers) or "Yeddi gözəl" (Seven Beauties), which is linked to ancient Turkish mythology, numerological beliefs, and folk observations (Əliyeva, 2010). Expressions like "Aysız axşam" (moonless evening) and "Ulduzlu gecə" (starry night) reflect the metaphorical use of celestial bodies in daily life. Turkic, Persian, and Arabic linguistic influences are observed in Azerbaijani cosmonyms, showcasing the rich historical connections and cultural diversity of the Azerbaijani people.

Hydronyms: The manifestation of the water world in languages

Hydronyms, the names of rivers, lakes, seas, springs, and other water bodies, can be associated with geographical features, historical events, local beliefs, and the surrounding flora and fauna. They serve as important sources for studying the ancient settlement history and linguistic layers of a region (Room, 1996). The names of major French rivers (e.g., Seine, Loire, Rhône, Garonne) typically have Celtic or Gallo-Roman origins. These names reflect the ancient history and diverse cultural influences of the region. For example, the name "Seine" is believed to derive from a Celtic word meaning "sacred river" (Sequana). The "Rhône" has a Proto-Celtic origin related to "running." Lake names (e.g., Lac Léman – Lake Geneva, also known by its Celtic name Lemanus) also exhibit similar ancient origins, highlighting the deep historical roots of the French landscape and its naming conventions. Azerbaijani hydronyms are of Turkic, Persian, and in some cases, Caucasian origin. The name of the "Kür" river is widely believed to be of ancient Turkic origin, while "Araz" is thought to derive from Old Persian, reflecting the historical interactions of the region (Gədirov, 2007). Lake names (e.g., Göygöl – Blue Lake, Sarısu – Yellow Water, Masazır – Salt Lake) are often related to color, form, or water characteristics, indicating the Azerbaijani people's close observation of nature and their environment. The name of the "Xəzər" (Caspian) Sea is linked to the ancient Turkic Khazar tribes, signifying the historical dominance and cultural impact of these groups in the region.

The language of place names

Toponyms, the names of settlements, mountains, valleys, and other geographical features, can provide rich information about a region's geography, the occupations of its inhabitants, historical events, or ethnic composition. They are crucial for historical linguistics and cultural geography (Nicolaisen, 1976). French toponyms are highly diverse, incorporating Celtic, Gallo-Roman, Germanic, and Roman-era influences. The name "Paris" is linked to the ancient Celtic tribe, the Parisii. "Lyon" originated from Lugdunum during the Roman era, a name with Celtic roots referring to the god Lug. In village and town names, elements like "ville" (town/village, e.g., Villeneuve – New Town), "mont" (mountain, e.g., Mont Saint-Michel), "font" (spring, e.g., Fontainebleau), and "château" (castle, e.g., Châteauneuf) are frequently encountered. These components reveal historical settlement patterns, geographical features, and architectural heritage. Azerbaijani toponyms are also rich and multifaceted. They are primarily formed from Turkic, Persian, and in some cases, Caucasian-origin words. The name "Bakı" (Baku) is presumed to have originated from the Old Turkic "Bad-kübə," meaning "windy place," or a Persian term "Bādkube" with a similar meaning. "Gəncə" (Ganja) is thought to derive from an Old Persian word meaning "treasure" (ganj). In mountain names, components like "dağ" (mountain, e.g., Böyük Qafqaz Dağları – Greater Caucasus Mountains) and "təpə" (hill), and in river-related place names, "çay" (river, e.g., Göyçay) are frequently found. Furthermore, Azerbaijani toponyms include numerous microtoponyms (local place names of minor significance) that reflect specific regional characteristics, economic activities, or historical events, offering deeper insights into local life and folklore (Adilov, 2017).

Phytonym-component phraseological units. The symbolism of plants in language

Flora-related phraseological units are fixed word combinations that utilize various plant names to express specific meanings and emotional nuances. These units vividly reflect the connection of both peoples with nature, their customs, and their underlying values. They are a significant part of the idiomatic richness of a language (Ağayev, 2015). French language is rich in phraseological units connected to flora, often conveying nuances of character, emotion, or situation:

"Être fleur bleue" (to be a blue flower) – to be overly romantic, naive, or sentimental.

"Jeter des fleurs à quelqu'un" (to throw flowers at someone) – to compliment or flatter someone excessively.

"Ramener sa fraise" (to bring one's strawberry, colloquial) – to unnecessarily intervene or show up where not wanted.

"Ne pas se prendre pour une poire" (not to take oneself for a pear) – to not be easily fooled or to be shrewd.

"Compter les marguerites" (to count the daisies) – to waste time, to be idle, especially at work.

"Être frais comme une rose" (to be fresh as a rose) – to be in excellent condition, well-rested, or healthy. These expressions demonstrate how the French language draws inspiration from the natural world to create vivid metaphorical expressions for everyday life. Azerbaijani also boasts a wealth of flora-related phraseological units, deeply embedded in the national worldview and reflecting cultural observations of plant characteristics:

"Gül-çiçək açmaq" (to bloom like a rose/flower) – to rejoice, to be happy, to flourish (in life or career).

"Ağacdan düşən yarpaq kimi" (like a leaf fallen from a tree) – to be pale, weak, or powerless.

"Yonca qədər ömrü olmaq" (to have a life as short as clover) – to have a very short lifespan.

"Alma ağacı altına salmaq" (to put someone under an apple tree) – to deceive, trick, or mislead someone.

"Xurma ağacı kimi boy vermək" (to grow tall like a date palm) – to grow quickly and become tall.

"Ot kökü üstə bitər" (grass grows on its own root) – used to imply that children inherit characteristics from their parents or ancestors.

"Dərya qədər sözü olub, saman çöpü qədər ağlı olmaq" (to have words like an ocean, but wits like a straw) – to be talkative but unwise. These expressions vividly illustrate how the Azerbaijani people's observations of plants and their various attributes are symbolically incorporated into the language, reflecting their wisdom and cultural nuances. The comparative analysis of cosmonyms, hydronyms, toponyms, and flora-related phraseological units in French and Azerbaijani languages unequivocally proves the richness and distinctiveness of both linguistic systems. While common international terminology is observed in cosmonyms, each nation's unique celestial observations and mythologies are also deeply reflected. Hydronyms and toponyms prominently highlight geographical, historical, and ethnic differences, acting as linguistic maps of past migrations and environmental interactions. Flora-related phraseological units, in turn, symbolically express the intimate connection of both peoples with nature, their customs, and their underlying values. This comparative study demonstrates that language is not merely a means of communication, but also a profound mirror of culture, history, and interaction with the environment. The detailed examination of these linguistic units offers profound opportunities to understand not only inter-language connections but also the diverse worldviews embedded within different cultures. Further research could delve into specific regional variations within each language or explore the influence of modern global trends on these traditional naming systems.

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FRANSIZ DİLİNDƏ NİDALARIN MƏNA NÖVLƏRİ VƏ İŞLƏNMƏ MƏQAMLARI

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Məqalədə əsas olaraq fransız dilində nidaların məna növlərindən və işlənmə məqamlarından söhbət gedir. Nida cümlələrinin müxtəlif dilçilər tərəfindən araşdırılmasından və bu araşdırmaların mübahisə doğurmasından danışılır.

Məqalədə nida cümlələrinin bir sıra növləri olduğu vurğulanır. İntonasiya ilə ifadə olunan nida cümlələri, tamamlanmamış nida cümlələri,
bir nida sözündən ibarət olan nida cümlələri. Bunlar özləri də iki yerə bölünürlər. Bir neçə göstəricilərlə bağlanan vasitəli nida cümlələri və vasitəsiz nida cümləl əri.

Eyni zamanda məqalədə morfoloji və semantik cəhətdən nidaların iki qrupa ayrıldığı göstərilir. Birinci qrupa daxil olan nidalara əsas olaraq ilkin nidalar aiddir bunlara onomotopelər daxildir. İkinci dərəcəli nidalara feilə, isimə, sifətə aid olan nidalar daxildir. Məqalədə nidaların kontekstə uyğun müxtəlif mənalar ifadə etdiyi də göstərilir. Nida cümlələrinin digər cümlə növlərindən necə fərqləndiyinə də diqqət çəkilir.

Acar sözlər: Nida cümləsi, intonasiya, nida sözləri, cümlə növləri, işlənmə formaları, onomotopelər, köməkçi söz, feilsiz cümlələr, yarımçıq cümlələr.

Dil hadisəsi olaraq nidalar şübhəsiz ki, ən mübahisəli və nəticədə marginalaşdırılmış bir təhlil mövzularından biridir. Claude Brudantın qeyd etdiyi kimi antik dövrdən bəri qramatiklər onun nitq hissələrindən biri olub olmaması, nitqin bir hissəsi kimi, yaxud da müstəqil bir nitq hissəsi olub olmaması ilə maraqlanmışlar. Nadir istisnaların olmasına baxmayaraq aleksandrian adlanan qramatiklər nidaları feilə qoşulan zərflər kateqoriyasına aid edirdilər. Nidalara aid olan xüsusiyyətlər get-gedə artmaqda və dəyişməkdədirlər.

Nidaların haqqında iki mənalı fikirlər irəlidəki dövrlərdə də davam edəcək. Onun nitq hissələrinə aid olub olmaması müzakirə obyekti olaraq qalacaq, bəziləri üçün bu bir nitq hissəsi, digərləri üçün xüsusi sözlər adlanır. Demək olar ki, nidalar nisbətən az öyrənilmiş və dilçilik sistemindən kənarda qalmışdır. Bununla belə 20-ci əsrdə inkişaf etməkdə olan bir sıra yeni tədqiqatlara yol açan bəzi təhlillərin əhəmiyyətini vurğulamaq lazımdır. Məhz latın qramatikləri nidaları fərdiləşdirərək yunan qramatikasında reallığa uyğun olmadığını vurğulayır, çünki nidalar feilsiz cümlələrdə də işlənə bilirlər. İlk dəfə olaraq nidaların sərbəst nitq hissəsi olduğu qənaətinə Romenos Paleonun və dolayısıilə Varronun əsəflərində rast gəlinir. [1. s.33-34]

Əlbəttə nida cümlələrinin növlərini və işlənmə məqamlarını araşdırmadan öncə bu qrammatik kateqoriyyaların hansı dilçilərin araşdırmalarında necə tədqiq olunduğuna nəzər salaq. Bu nəzəri biliklərə ehtiyacımız vardır.

Nidalar üzərində tədqiqatlar aparmış bir neçə tədqiqatçılar qeyd edirlər ki, bu fenomeni tədqiq etmək çətindir və onların qarşısında belə bir sual dayanır ki, nidalar bir qramatik kateqoriyalardır yoxsa nəqli, sual, əmr cümlələrinə qoşulan əlavələrdir. Prenoron və Vidal-Petit qeyd edirlər ki, semantik və sintaktik olaraq işlənməmiş nidaları təsvir və təsnif etmək çətindir. Bu nökteyi nəzərdən nidalar bir neçə baxış açısından tədqiq edilmişdilər.

Bəzi müəlliflər (bunlar arasından Camugli-Gallardo 1995; Morel 1995; Prenoron və Vidal-Petit 1995) nida cümlələrinin xüsusi bir intonasiyaya malik olduqlarına əsaslanırlar. Bununla bərabər bir sıra qarışıq qramatik fikirlər ortaya çıxmış olur. Grevisse və Coosse nidaların üç göstəricilərinin olduğunu vurğulayırlar: nida sözləri, feilsiz və vurğulanmış cümlələr.

Dubois və Lagane (1989) nida cümlələrini təsdiq, inkar, məlum, məchul cümlələrə əlavə kimi görürlər.

Wilmet nidaları nəqli cümləyə əlavə olunan intonasiyalı melodiya adlandırır.

Riegel və digərləri (1994) nidaları yaradan beş cümlə quruluşunu qeyd edirlər: tək intonasiya, tamamlanmamış kəsilmiş yaxud da adlıq cümlə, nida sözləri və əsas üstünlükləri nidalardan təşkil olunmuş ayrılmış cümlələr, et + GN + qui +GV tipli cümlələr, nida məsdərləri, nida cümlələri formasında ortaya çıxan arzu şəkilli cümlələr yaxud da qüvvətli deyilən nida cümlələri.

Bu təsnifatlara biz Groussier 1995; Chanrand 1999; Brest 1995; Sibiot 1995; Laurendeau 1995 və digər müəlliflərin əsərlərini də əlavə edə bilərik. Onu da qeyd etmək lazımdır ki, nidalar üzərində tədqiqatlar aparan dilçilərin əksəriyyəti Milnerin yüksək dərəcə anlayışına istinad etmişlər. Milnerin fikrinə görə nida kimi qruplaşdırılan ifadələrdə həm yüksək dərəcədə keyfiyyət həm də kəmiyyət ifadə olunur.

Müəlliflərin nidalara verdikləri tərif müxtəlifdir, lakin onlar ən azından məna baxımından keyfiyyətdə və kəmiyyətdə yüksək dərəcənin olduğu fikiri ilə razılaşırlar. [2. s. 2-5]

Fransız dilində də nidalar və nida cümlələri danışanın nitqinin məzmununa uyğun olaraq qəzəb, təəccüb, sevinc və s. duyğuları ifadə edirlər. Nidalar özlərinin düşən və qalxan intonasiyaları ilə xarakterizə edilirlər. N. Steinberg Grammaire française kitabında nidaları belə xarakterizə edir: ,, Nidaların xüsusi forması olmaya bilər, bu cümlələr nəqili –nida, sual- nida, əmr-nida cümlələri ola bilərlər, lakin hər zaman affektif bir xarakter daşıyır və kiminsə (sevinc, heyranlıq, qəzzəb, təəccüb) duyğularını ifadə edir və onun özünəməxsus intonasiyası var''. [5. s.8]

Semantik nökteyi nəzərdən nida cümlələri kəmiyyət və keyfiyyətin yüksələn dərəcəsini ifadə edirlər. Məs:

Comme il a grandi!

Que c'est beau!

Nidaların müxtəlif quruluşları vardır. Məs: Bir şəxsin mehriban biri olduğunu ifadə etmək üşün müxtəlif cümlə növlərinə müraciət etmək olar. (D.Maingueneau 1994: 58) :

1. *Qu'il est gentil!*
2. *Comme il est gentil!*
3. *Est-il gentil!*
4. *Il est si/tellement gentil!*
5. *Quelle gentillesse!*
6. *Il est d'une une gentillesse !*
7. *Cette gentillesse!*
8. *Il est d'une une telle gentillesse !*
9. *Ce qu'il est gentil !*
10. *S'il est gentil*
11. *Dieu sait si /comme il est gentil !*

Nida cümlələrinin quruluşu sual cümlələri ilə müqayisə edilir və bu zaman nida sözlərinə yaxud da sual sözlərinə müraciət etmək olar (qui, que, quel) :

Que tu es sot !

Mübtədanın inversiyası ilə : *Est-il bete!*

Yaxud da səsin intonasiyası ilə:

Tu fais le raisonneur!

J'aime les roses!

Que və *Comme* zərfləri əsas olaraq nidalardırlar.

Nida cümlələrinin Bir sıra növləri mövcuddur.

1.İntonasiya ilə ifadə olunan nida cümlələri.

İntonasiya nida cümlələrinin əsas hissəsidir. İntonasiya nida cümlələri vasitəsilə oxucunun ifadə etdiyi duyğunu göstərir. Bu zaman cümlənin sintaktik quruluşu dəyişmir. Nəqli cümlənin quruluşunda olduğu kimi qalır: GN + GV. Məs:

Tu l'as vu (Georges)! J'adore les livres policiers!

2. Bir nida sözündən ibarət olan nida cümlələri. Bunlar özləri də iki yerə bölünürlər. Bir neçə göstəricilərlə bağlanan vasitəli nida cümlələri və vasitəsiz nida cümlələri.

Vasitəli nida cümlələri bir neçə göstəricilərlə bağlanırlar:

- Que zərfi müstəqil nida cümlələrini bir- birinə bağlayır:

Que d'eau, Que de monde, Que de gens, Qu'elle est intelligente!, Qu'il est adroit!

Comme zərfi nidanı sifətin, feilin, zərfin üzərinə salır: *Comme tu es mechante!, Comme le temps passe!, Comme il est loin!*

Sual cümlərində *comme comment* sözü ilə əvəz edilir.

Combien həm nida həm də sual cümlələrində işlədilir. Nida cümlələrində mübtədanın invversiyası məcburi deyil. Məs: *Combien d'orgueil!*

Combien çox vaxt vasitəsiz nida cümlələrində işlənir. Məs: Je sais combien tu as insisté auprès de lui!

- Quel təyin edicisi təəcüb və qəzəb ifadə edən nida məlumatlarında və yaxud nida cümlələrində ortaya çıxırlar:

Quel type!, Quelle idee elle a!

- *Qui Qui sait!*

- *Ce que; qu'est-ce que* ifadələri sifətin yaxud da feilin üzərinə əlavə edilir:

Ce qu'elle m'agace! Qu'est-ce qu'il mange!

Vasıtəsiz nida cümlələri *voir* və *savoir* feilləri ilə işlənirlər.(Grevisse – A. Grosse 1995:376)

Tu vois comme elle a changé.

Tu sais combien j'aime le silence.

Bu nida cümlələrinin vasitəsiz tamamlıq yaxud da mübtəda funksiyaları da ola bilərlər. *Peu importe qui l'a fait.*

C'est étonnant comme il a changé.

Nida sözləri olmayan nida cümlələri də bir neçə yerə bölünürlər:

Mübtədanın inversiyası ilə olan nida cümlələri sual cümlələrinə yaxınlaşır. Nida, sual yaxud da nəqli cümlələr arasındakı fərq intonasiya ilə edilir.

1. *Elle est curieuse.*
2. *Est-elle curieuse !*
3. *Est-elle curieuse?*

Nida nəql edən şəxsin həyacanlı reaksiyası kimi təqdim edilir, əşyaların vəziyyətini təsvir etmir. (D. Maingueneau 1994: 59).

Quelle femme ! Est-elle curieuse ! kimi işlənmiş bu cümlələr intonasiyanın funksiyasına görə sual yaxud da nida cümlələri ola bilərlər:

- Sual kimi ifadə olunduqda bu cümlələr oxucudan bir seçim tələb edir. Məsələn: *etre curieuse/ n'est pas etre curieuse.*
- Nida kimi ifadə olunduqları zaman onlar oxucudan heç bir seçim tələb etmirlər.

Nida cümlələrində mübtədanın *quel* sözü ilə inversiyaya uğraması əsas olaraq müasir fransız dilində işlədilir:

Quel plaisir nous a fait sa visite!

Tamamlanmamış nida cümlələri

Yarımçıq cümlələr adətən sayılmayan un/ une artikilləri ilə işlədilir :

Elle est d'une tristesse!

Il m'a préparé un café!

Ardıcıl budaq cümlələrinin olmadığı zaman işlənirlər:

Elle est si triste!
Il est tellement appliqué!

Nida cümlələri arasında arzu ifadə edən və feilin arzu şəklinin sadə formasında işlənən cümlələrdə vardır. *Pouvoir* feili köməkçi funksiyasında işlənərək *pourvu que* formasında olur.

O que ma quille eclate! O que j'aille a la mer! (Rimbaud)
Puisse – je n'avoir lance dans la bataille de la vie que des traits aussi innocents! (France)
Puisse cet homme aimer les savants (France)
Oh! Pourvu que je tiens jusqu'a l'aube.... (Daudet)
Schulz regardait le ciel avec anxiete: - Pourvu qu'il fasse beau demain! (Rolland)

Pourvu que bağlayacısı ilə işlənən bu arzu ifadə edən cümlələrin budaq cümlələr olmasına baxmayaraq onların müstəqil cümlə mənaları var.

Arzu ifadə edən şərt budaq cümləsinin baş cümləsi olmadığı tədqirdə işlənirlər :

S'il faisait beau! A huit heures et demie, la comtesse l'attend. – S'il manquait au rendez-vous? (Maupassant) [5. s.9]

Bu cür tamamlanmamış cümlələrdə nidalarınn rolları onların uyğunluğunu təmin etmək üçündür, xüsusilədə şifahi nitqdə danışıq zamanı nitqi ifadə etməyə kömək edirlər.

Adlıq cümlələr : *Dieux! ; Mon Dieu!; Ce fou!; Le traître!*

Nidaların xüsusi formaları aşağıdakılardır

- et+sujet+relative quruluşunda olanlar
- *Et Paul qui ne vient pas !*

Nida formasında olan məsdərlər: *Quelle confession à lui faire!*
Me parler avec cette impudence!

Arzu ifadə etmək üçün müstəqil cümlələrdə işlənən arzu şəkli:

Que l'année suivante vous apporte du bonheur!
Qu'ils soient heureux!

Keçmiş zaman feili sifəti: *Finies les vacances!*:

Qeyri-ixtiyari işlənən ifadələr. *C'est le comble! ; C'en est trop! ; C'est l'heure!*

Nida formasında olan məsdərlər cümlənin ilkin formasında olduğu kimi təqdim etməyə xidmət edirlər və danışan şəxsin duyğusunu və həyacanını ən yaxşı formada ifadə etməyə uyğun gəlirlər: *Quelle confession à lui faire! Voir Naples et mourir ! - ,, Aimer aimer seulement, quelle impasse!'' (Saint- Exupery) – Les memes qu'on n'est pas le chene ou le tilleul, / Ne pas monter bien haut, peut-etre, mais tout seul ! (E.Rostand) – Ah !ne pas savoirsi l'on s'aime…. Ne pas conduire sa beaute ! (Gide).*

Bu tipli cümlələrdə göstərilməyən mübtədanı kontekst sayəsində bərpa etmək olar. [3. s.406]

Nidalar aşağıdakı formalarla qüvvətləndirilə bilərlər.

-Xitab vasitəsilə : ***Hélène**, tu es extraordinaire !*

- Təyin vasitəsilə: *Bête **que tu es**!*

Müəyyən artikili ilə ***Le** pauvre enfant!*
***La** jolie robe!*

un/ une artikilləri ilə gücləndiriən təyin edicilər: *C'est **d'une** impertinence!*

-Nidalarla:

***Ah**! Que le monde est plein d'impertinents!*
***Hélas**! Qui peut aimer ainsi!*

Dilin özəlliyini işıqlandırıan nidalar danışan və dinləyəci arasında əlaqəni göstərir, danışıq vəziyyətinə müraciət edir, danışan şəxsin qarşılaşdığı hadisəyə reaksiyasını bildirir.

T. Cristea oxucunun duyğularını bildirən *donc, bien, déjà* terminlərini əlavə sözlər adlandırır. (cf. T.Cristea 1979: 409)

C'est bien ma veine, hein! [6. s. 46-47]

Anna Bobinska Nidaların nitqdə funksiyaları əsərində onları morfoloji və semantik cəhətdən təhlil edərək yazır: ,, Məlumdur ki, morfoloji nökteyi nəzərdən nidalar dəyişməyən sözlər kateqoriyasına aiddirlər''. O nidaları morfem formaları, bir söz və bir birləşmə halında ümumiləşdirir.

Birinci qrupa daxil olan nidalara əsas olaraq ilkin nidalar aiddir bunlara onomotopelər daxildir:

- Müxtəlif sözlər, səslər, qışqırıqlar, saxta cığlıqlar, çox vaxt instinktlər, insan mənşəyi, duyğuları və emosionel reaksiyaları, fərdin müsbət və mənfi xüsusiyyətlərini ifadə edirlər. Nümunə olaraq deyə bilərik:

Pfff ! Shhtt ! Hip ! Yahouuu ! Bééé! Rhâââ!Hiii! Aaï euhh! Pfchié! Brrr! Wôôôô! Bwééé! Raaao! Wooouaaï e! Bleurg! Snuf! Rôôôô!

- Insan səslərinə aid olmayanlar əşyaların yaratdığı səslər maşınlardan, müxtəlif dəzgahlardan yaxud da hər hansı hadisələrdən (kiminsə suya düşməsi, nəyinsə qırılması, kağızın cırılması) şəxsin düşdüyü vəziyyət zamanı əlavə verilən informasiyalardır. Nümunə olaraq bunları göstərmək olar:
- *Vrrrmm! Vzzz! Vrrr! Poiiing! Toc! Glou! Ploc! Biip! Badam! Grush! Bun! Bonk! Zbaff! Zmak! Biâfrr! Groumtch! Gmo! Voush! Bom! Frott! Smmuf! Wwwwwwwwww! Crash! Zwap! Fletch! Flash! Thunk! Slam! Plak!*

Ikinci qrupa daxil olanlar səs təkrarı olan nidalar deyil ikinci dərəcəli nidalardır. Bu nidaların başqa bir mənbəyi var və qramatik və semantic cəhətdən dəyişikliklərə düçar olmuşlar.

- Feilə aid olan nidalar:

Oyez! Dis donc! Voili-voilou! Alléééé! Voyons! Kiffc ta journee! Va manger tes morts! Gratte!Grat! Tiens!

- Isimə aid olan nidalar:
- *Nicke! Jesus Lord! Bande de maladies! Nom d'une pute en bois! Espece de psychopathe ! O desespooôûûr ! Purée ! Putard ! Mer-deuh ! Sale malade ! Diantre Margaux ! Nickel ! Bande de malades ! nidalarConnasse de chiotte de pute de connasse de merde ! Ta gueule! Lw! Pute borgue!*
- Sifətə aid olan nidalar:
  Impec!Sympa! Grave!Dement!Super! Extra!Magnifique! Sacré journée !
- Zərfə aid olan nidalar:
  Alors! Ça alors!
- Qısaltmalarl
  LOL! MDR! PTDR! OMG! [1. s. 36-38]

Nidaların bəziləri başqa dillərdən alınmalardır: Bravo! (italyan); Baste! (italyan); Vivait (latın); Halte! (alman); Hourra! (ingilis); Stop! (ingilis).

Bəzi and bildirən nida sözləri evfemizmlərlə əvəz edilmiş dini lüğət terminlərini təqdim edirlər: *Parbleu! (par Dieu); Mortbleu! (mort Dieu ou mort de Dieu); Vertubleu! (vertu Dieu) ; Sacristil ou Sapristil ! (derive du sacre) ; Diantre ! (diable) etc.*

Bütöv bir cümlə öz həqiqi mənasını itirərək nidalı ifadəyə çevrilə bilər : *Ça y est ! – hər şey yolundadır; Tu parles ! – heç olmasa*

Daxilində müxtəlif nüanslar saxlayan nidaları ümumi olaraq iki qrupa bölmək olar. Bunlar aşağıda göstərilənlərdən ibarətdir.a) həyacan ifadə edən nidalar (sevic, ağrı, cəhd, təəssüf və s.) yaxud da kənardan gələn bir hərəkətə qarşı reaksiya (razılıq, bəyənmə, nifrət və s.) və istək, çağrış, təkid, nəyəsə bir şeyə dəvət ifadə edən nidalar.

Həyacan bildirən nidalar arasında dəqiq mənası olmayan, dəyişməz nidalar var, onların mənaları kontekstə, situasiya, intonasiyaya uyğun olaraq təyin edilirlər. Beləliklə *Ah!, Oh!, Eh !, Dieu !, O !* nidaları heyranlıq, sevinc, təəccüb, təəssüf, səy bildirən hallarda işlənirlər. Aşağıdakı nümunələrdə bunları görə bilərik.

Un cri sort de tous les bouches:,, Ah! Le beau bateau''(Daudet)

Ah ! il était parti, le seul charme de sa vie, le seule espoir possible d'une felicite ! (Flaubert)

Ah ! le bandit !il s'est doute de quelques choses ! … (Daudet)

Digər həyacan bildirən nidaların az da olsa mənaları var. Onlar ümumi olaraq təəssüf, ağrı ifadə edirlər.

Helas !, Aïe ! Ahi !

Təəccüb ifadə edənlər: *Ouais! Ha ! Ça! Oh la la!Dame! Tiens!*

Tiens!, Lolita, 21 septembre? Mis alors demain est mon anniversaire de naissance. (Maurois)

Naturellement, je me reserve une rente. Dame! il faut vivre. (Mauriac)

Le maitre regarde Paul, tâte sa main, son poingnet. – Ah ça ! mais cet enfant a la fievreş (Vaillant -Couturier)

Təəccübləndirmə, qəzəblənmə ifadə edənlər: *Comment! Quoi ! Ho ! Par exemple !*

Quoi! monsieur, vous etes le fils de cet exellent docteur de M-lle Perle ? – Mais non. Ton père ne te l'a jamais racontee ? – Mais non – Tiens, tiens, que c'est drole ! ah ! par exemple, que c'est drole ! Oh ! mais, c'est toute une histoir ! (Maupassant)

Təəccübləndirmə, heyranlıq: *Fichire !*

Laqeyidlik, qayğısızlıq: *Bah! Ah bah!*

- *Bah qu'est ce que ça fait, pour moi? Replique Sylvie (Rolland)*
- *-Cela ne va guere a la circonstance.... Ah bah! n'importe (Flaubert)*

Razılıq, təsdiqləmə: *Bon! Bravo! A la bonne heure! Tu parles!*

Istehzalı razılıq: *Oui da!*

- Vous avez mal fait de raser votre barbe c'est la seule chose qui vous manqu, pour etre un sage. - *Oui da!(Diderot)*

Nifrət, zövqsüzlük, bəyənməmə : *Hou! Fi! Fi donc! Peuh Pouah! Zut!* (əsas olaraq danışıq dilində işlənirlər).

Rosine – Vous me faitetrembler, monsieur Figaro.

Figaro- Fi donc, trembler ! (Beaumarchais)

Sevinc ifadə edən nida sözü *Hourra !*

İstehza və inamsızlıq ifadə edən nidalar *Ha! ha! Tarare! Ouiche! Allons donc!*

- *J'en ai connu, des pretres, qui s'habillaient en bourgeoise pour aller voiregigoter des danseuses. – Allons donc! Fit le cure. Ah! J'en ai connu! (Flaubert)*

Yüngülləşmə ifadə edən *Ha! Ouf!*

Ouf! Madame Boutet vient de nettoyer sa cuisine (Laffitte)

Ikinci qrupa daxil olan nidaların əksəriyyətinin bununla belə az yada çox sabit mənaları vardır. Onlar ümumi olaraq aşağıdakı hallarda işlənirlər:

a) Çağırmaq üçün *He! Hola!Ohe!Ho! Pst!St!*

..... nous nous mettons tous a crier bien fort .... – Ohe! Du moulin! Ohe ! maitre Cornille (Daudet)

Je l'appellaits deux fois: He! Hola ! la- bas ! (Maupassant)

Rosine …. (regard en dedans et fait signe dans la rue). –Si. Si ! Ramassez vite et sauvez-vous. (Beaumarchais)

b) Sakitliyə dəvət etmək üçün : *Chut! Motus !(Ne dites mot)*

- Chut ! chut fit Emma en designant du doit l'apothicaire. (Flaubert)

……. Il se mettait un doigt sur les levres et repondait gravement :,, Motus je travaille pour l'exporation..'' (Daudet)

c) Mülayim olmağa çağırmaq üçün işlənən nidalar: *Tout beau! Toux doux !*

OCTAVE (retenant Leandre). – Tout doux !(Moliere)

Hector, emu, tachait de le calmer [son cheval] : ,,Allons, tout beau, mon ami, tout beau'' (Maupassant)

Kimisə qovmaq və tələsdirmək üçün işlənən nidalar : *Oust !*

.... A devient tres blanc. Jacquot le soutint sous les epaules. – Allons, sacre vieux ! Oust ! a la pharmacie(Chabrole)
e) Özünü qorumağa çağırmaq üçün: *Gare!*
Et Annette pensait : Gare, a qui elle croque !(Rolland)
Dayandırmağa çağırmaq üçün: *Halle! Stop!*
Ils etaient prets a tirer, la vivandriere regarda a travers les feuilles et cria : Halte ! Et se tournant vers les soldats : Ne tirez pas, cammarades. (Hugo)
g) Sakitləşdirmək və təsəlli vermək üçün işlənirlər: *La!La! la! Allons!*
La!La! la!,mon gentilhomme, fit l'hote [.....] la, tranquillisez vous [.....](Dumas)
Allons, allons, mon cheri, n'aie pas peur! (France)
Allons, mon pauvre ange, du courage, console-toi, patience! (Flaubert)
h) *Nəsə bir şey etmək üçün cəsarətləndirmək məqsədi ilə: Allez-y!*
,,Vous voulez interroger Dede? Pourquoi pas? Allez-y, mon ami''(Simenon)
İ) Suala cavab vermək yaxud da başa düşülməyən bir şeyi təkrar etməyə xidmət edirlər: *Hein?*
- Hein tout de meme, si nous l'avions reporte chez le commissaire? (Daudet)
Leonie se pencha et en l'embrassant insista a voix basse: - Tu me pardonnes? Dis? Bein? Dis? (Mauris)
j) Diqqət çəkmək üçün, dinlətmək və baxdırmaq üçün işlənən nidalar: *Tenez!*
Tenez! Pas plus tard qu'hier soir, j'ai assiste a la rentree des troupeaux dans un mas [une ferme]..... (Daudet) mis leurs pieds sur le mur, ils ont sau
Et les deux femmes effarees contemblaient les traces de pas, bavardaient, supposaient des choses : ,,Tenez, ils ont passe par la. Ils ont mis leurs pieds sur le mur, ils ont saute dans la plate- bande''. (Maupassant)
k) Nəsə bir şey etmək üçün stimul vermək: *Va! Allona! Allez!*
Allons, cours-y, amuse-toi! (Flaubert)
Allons, allons, dit Parent, faites un petit sourir. (Couttade)
Allez, laisse-moi passer? (Chabrol)
Allez, rentre. Viens ...(Stil)
Lakın *tenez!* allons! *allez! Voyons* kimi əmr formasında olan nidaların digər mənaları da ola bilərlər:

- *Allons, monsieur le Maire, vous n'allez pas nous quitter! (Chabrol)*
- *Voyons, donnez-nous des details, repetait madame de Boves avec insistance.(Zola)*
- *Alors parce quenous sommes le Parti de la Paix, nous devons laisser la porte ouverte a la guerre? Voyons! Ce n'est pas possible. (Stil)*

Bildiyimiz kimi nidalar cümlə üzvləri deyildirlər, demək olar ki, onlar sintaksisdən kənarda qalırlar. Onlar ümumi olaraq nida işarəsi ilə müşayət olunaraq tək, cümlənin əvvəlində, yada sonunda, sintaktik cəhətdən cümləyə bağlı olmayan, vergüllə ayrılan tək bir cümlə formasında işlənə bilirlər.

İstisna olaraq bəzi nidaların tamamlıqları da ola bilərlər. Xüsusilə biz bunu *Gare!, Tu parles* nidalarının işlənmə hallarında görə bilərik.

Gare aux voleurs! Gare les consequences!ö Gardez-vous des consequences!
- Gare a qui tu touche!(Rollant)[Que celui qui le touche prenne gare]
-Tu parles d'un chic sujet, le Buffon? (Vaillant-Couturier)
Diable – Lənət şeytana sözünün nida mənası var və sual cümləsinin ortasında yerləşə bilər, sual sözü və feilin ortasında, heç bir nida işarəsi işlədilmədən:
Que diable allait-il faire dans cette galere? (Moliere)
Que diable entend quelque chose a la bizarrerie des femmes? (Beaumarchais)
A quoi diable as-tu passe ton temps depuis trois ans qu'on ne te voit plus?(Merimee)
Alors, si on lui demandait d'ou diable pouvait venir tant d'ouvrage, il se mettait un doigt sur ses levres et repondait gravement.... (Daudet)

Bütün bunlardan görürük ki, nidalar cümlə üzvünə yaxınlaşırlar ancaq onların funksiyalarını yerinə yetirə bilmirlər, çünki onlar nə emosionaldırlar nə də iradəlidirlər. Bu qrupa daxil olan nidalar aşağıdakılardırlar:

a) Təbii səslər və heyvanların qışqırıqları, səslər: *Cocorico! Miaou! Pan! Vlan! Crac! Patatras! və s.*

b) Nəzakət bildirən sözlər : *Bonjour! Bonsoir! Merci! Salut! Adieu ! Au revoir !* [4.s.330-335]

Romalıların natiqlik sənəti üçün, zövqlə istifadə etdikləri nida cümlələri çox tez-tez latın dilində, xüsusən də siyasi və hüquqi çıxışlarda və müraciətlərdə çox istifadə olunurdu. Tarix, nida cümləəri formasında məhşur şəxslərə aid olan bir neçə sözləri də günümüzə gətirib çıxarmışdır. Məs: *(Neron: Qualis artifex pereo! ,, Quel artiste perit avec moi'', Caligula: Oderint dum metuant! ,, Qu'ils me haïssent, pourvu qu'ils me craignent!'').*

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THE IMPORTANCE OF UTILIZING DIGITAL TECHNOLOGIES IN ENGLISH LANGUAGE INSTRUCTION

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Abstract
This study investigates the significance and evolving role of digital technologies in English language instruction through a comprehensive bibliometric analysis of Scopus-indexed literature from 2000 to 2025. Drawing on quantitative and qualitative data, the research identifies key thematic trends, geographic patterns, and influential publications that have shaped the discourse on technology-enhanced language learning. The findings highlight a shift from traditional instructional models toward more learner-centered, multimodal, and digitally integrated pedagogies. Notably, the study reveals three dominant conceptual clusters: pedagogical integration, technological tools and multimodality, and learner-centric approaches. While the integration of digital technologies offers clear pedagogical advantages such as increased learner autonomy, engagement, and accessibility it also presents ongoing challenges, particularly concerning teacher training, digital literacy, and equitable access. The study concludes that successful implementation depends on systemic readiness, pedagogical innovation, and context-sensitive strategies. It contributes to the global discourse on educational technology by offering insights into emerging research gaps and future directions for policy, practice, and inquiry.

Keywords: digital technologies; English language teaching; educational technology; e-learning; bibliometric analysis.

Introduction

Relevance of the Study. In the context of rapid globalization and the digital transformation of education, the role of digital technologies in foreign language instruction has become increasingly significant. English, as a global lingua franca, occupies a central position in international communication, academic exchange, and professional development. Consequently, the methods and tools used in teaching English must evolve in tandem with technological advancements to meet the changing needs and expectations of modern learners. The integration of digital technologies into English language instruction represents not only a pedagogical innovation but also a necessary response to the demands of contemporary education systems. The COVID-19 pandemic has further highlighted the importance of digital solutions in maintaining the continuity of language learning. Online platforms, educational applications, and interactive multimedia resources have enabled teachers and students to sustain the learning process beyond the physical classroom. This global shift has underscored the potential of digital technologies to enhance access, flexibility, and personalization in English language education. Numerous studies have demonstrated that the use of digital technologies can significantly improve language acquisition by creating interactive, immersive, and student-centered learning environments. Furthermore, the use of digital tools in English teaching encourages learner autonomy and motivation. Through mobile learning, gamification, and real-time interaction, students gain greater control over their learning trajectories, which fosters a sense of responsibility and self-regulation. At the same time, teachers are empowered to adopt more innovative, data-driven, and reflective practices in their pedagogy, enabling continuous assessment and adaptation to learners' progress. Despite the clear benefits, the integration of digital technologies also presents challenges. Issues such as digital literacy, unequal access to technological resources, and the need for professional development among teachers must be carefully addressed. Therefore, the effective implementation of digital tools in English instruction requires a balanced approach that considers both pedagogical goals and infrastructural realities. This study is relevant because it contributes to the ongoing academic discourse on educational innovation and digital pedagogy. By exploring the importance, opportunities, and limitations of using digital technologies in English language instruction, the research aims to provide valuable insights for language educators, curriculum developers, and policymakers. It underscores the need to reconceptualize traditional teaching models and embrace technology-enhanced learning as a means of promoting linguistic proficiency and educational equity in the 21st century.

The aim of this study is to explore and critically analyze the role and impact of digital technologies in English language instruction, with a particular focus on their pedagogical benefits, implementation practices, and implications for language learners and educators in the 21st century. To achieve the stated aim, the following specific objectives are pursued:

– to examine current trends and patterns in academic publications on digital technologies in English language teaching using Scopus-indexed data (2000–2025);
– to identify the most influential research works, themes, and regions contributing to the discourse on technology-enhanced English instruction;
– to investigate how digital tools affect learner motivation, engagement, and language acquisition;
– to analyze the challenges and barriers teachers face in integrating digital technologies into English language classrooms;
– to provide evidence-based recommendations for effective incorporation of digital technologies in English language pedagogy.

The object of this study is the process of English language teaching in the context of contemporary digital transformation in education. *The subject of the study* is the use of digital technologies, platforms, and tools in English language instruction, as well as their pedagogical effects and practical applications.

Research Question: How do digital technologies influence the effectiveness, accessibility, and pedagogical strategies of English language instruction, and what are the emerging trends, challenges, and opportunities in their implementation?

This study holds both theoretical and practical significance. From a theoretical standpoint, it contributes to the expanding academic discourse on technology-enhanced language learning and computer-assisted language learning by mapping key trends, influential research, and conceptual intersections within the field. The study's bibliometric and visual analyses, grounded in Scopus data, provide a macro-level understanding of global research dynamics. From a practical perspective, the study addresses the growing demand for effective integration of digital technologies in English language classrooms worldwide. Its findings offer insights for educators, curriculum designers, and policymakers on how to leverage digital tools to improve language instruction quality, promote learner autonomy, and address existing gaps in digital literacy and infrastructure. Furthermore, the study reflects current global shifts towards hybrid and online education, thus remaining relevant in both post-pandemic recovery contexts and future-oriented educational planning.

Research Methodology. To achieve the stated research objectives and to provide a comprehensive analysis of the current state and trends in the integration of digital technologies into English language teaching, a mixed-method bibliometric analysis was employed. This methodology combined quantitative data collection through Scopus database querying with qualitative content interpretation and visualization techniques. The primary data source for this study was the Scopus database, selected due to its extensive coverage of peer-reviewed publications in the fields of education, applied linguistics, and technology-enhanced learning. The search query was constructed using the TITLE-ABS-KEY function to ensure the retrieval of documents with a strong thematic focus on digital technologies and ELT:

> *TITLE-ABS-KEY ("digital technologies" AND "English language teaching") AND (LIMIT-TO (EXACTKEYWORD , "English Language Teaching") OR LIMIT-TO (EXACTKEYWORD , "Students") OR LIMIT-TO (EXACTKEYWORD , "Digital Technologies") OR LIMIT-TO (EXACTKEYWORD , "Digital Technology") OR LIMIT-TO (EXACTKEYWORD , "Tertiary Education") OR LIMIT-TO (EXACTKEYWORD , "E-learning") OR LIMIT-TO (EXACTKEYWORD , "Teaching") OR LIMIT-TO (EXACTKEYWORD , "Teachers'") OR LIMIT-TO (EXACTKEYWORD , "Technology") OR LIMIT-TO (EXACTKEYWORD , "Pedagogy") OR LIMIT-TO (EXACTKEYWORD , "English Teaching And Learning") OR LIMIT-TO (EXACTKEYWORD , "English Teaching") OR LIMIT-TO (EXACTKEYWORD , "Teacher Training") OR LIMIT-TO (EXACTKEYWORD , "Digital Learning Environment") OR LIMIT-TO (EXACTKEYWORD , "Kazakhstan") OR LIMIT-TO (EXACTKEYWORD , "Higher Education") OR LIMIT-TO (EXACTKEYWORD , "English Languages") OR LIMIT-TO (EXACTKEYWORD , "English Language Teachers") OR LIMIT-TO (EXACTKEYWORD , "English Education") OR LIMIT-TO (EXACTKEYWORD , "Educational Technology") OR LIMIT-TO (EXACTKEYWORD , "Educational And Training Programs") OR LIMIT-TO (EXACTKEYWORD , "Education Program") OR LIMIT-TO (EXACTKEYWORD , "Education"))*

The data retrieved from Scopus was exported into bibliometric software for further processing and interpretation. The analysis followed several stages:

1. Descriptive statistical analysis. Identification of annual publication volume and citation dynamics (as presented in Figure 1), highlighting the temporal evolution of scholarly interest.

2. Geographic distribution analysis. Mapping of research productivity by country (Figure 2), enabling assessment of regional contributions and global research leadership in the field.

3. Co-occurrence network analysis. Using tool VOSviewer, keyword co-occurrence networks were constructed (Figure 3) to reveal core thematic clusters and conceptual linkages between terms such as digital literacy, pedagogy, motivation, and technology integration.

4. Citation analysis. A ranking of the top 10 most cited publications was compiled (Table 1), allowing identification of foundational literature and highly influential studies shaping the field.

As a bibliometric study relying solely on secondary data from publicly available academic databases, no human subjects were involved, and therefore, no ethical clearance was required. All bibliographic sources are duly cited in accordance with academic standards.

Literature Review

The integration of digital technologies into English Language Teaching has attracted increasing academic attention over the past two decades. The body of literature emphasizes the transformative potential of educational technologies to enhance pedagogical practices, student engagement, language acquisition, and teacher development. Digital literacy has become a cornerstone concept in modern English language instruction. Hafner (2014) demonstrated that student-created digital video projects facilitate the development of multimodal communication skills and foster learner autonomy. His study, which remains one of the most cited in the field, underscores the pedagogical value of embedding digital literacies into ELT through creative production and project-based learning. Similarly, Villamizar (2018) emphasized the importance of visual and digital literacies in higher education English programs, linking them to critical thinking and student agency. Motivation is another widely discussed dimension. Henry (2019) explored how online media creation, particularly in socially situated contexts, can enhance L2 motivation. The study found that students who engage in purposeful digital content creation are more invested in the language learning process. Artyushina et al. (2017) supported this view by demonstrating that podcasting as an e-learning tool not only improves listening skills but also increases student satisfaction and motivation. In the aftermath of the COVID-19 pandemic, digital competence among teachers and students has become a critical area of inquiry. Moorhouse (2023) examined teacher practices after an extended period of online teaching, revealing a positive shift toward hybrid and digital-first pedagogies. Kohnke and Moorhouse (2024) further analyzed the use of microlearning in continuous professional development, showing that short-form, flexible content delivery methods are well-suited for teachers' busy schedules. Several studies have focused on context-specific experiences with digital technologies. For instance, Nasim et al. (2022) evaluated the effectiveness of pronunciation tools for Saudi EFL learners, while Soyoof (2024a, 2024b) conducted two studies investigating Iranian mothers' roles in their children's home-based digital English literacy. These works highlight the socio-cultural dimensions of technology use, indicating that digital learning environments are shaped by family mediation, access, and cultural expectations. In the Central Asian context, Kazakhstan has been gradually integrating educational technologies into ELT. However, studies focusing specifically on this region remain limited. As digitalization in Kazakhstani higher education progresses, further research is needed to assess the local impact of e-learning environments and teacher readiness (Kassymova et al., 2022). Teacher training and pedagogical redesign are essential to the success of digital ELT initiatives. Victoria and Sangiamchit (2021) emphasized the role of interculturality and digital mediation in teacher education, while Soyoof (2024b) underscored the importance of parental involvement in developing early digital literacy. Moreover, broader studies such as those by Kukulska-Hulme and Shield (2008) and Godwin-Jones (2011) provide conceptual frameworks for mobile-assisted language learning and digital learning ecologies. The co-occurrence network analysis (see Figure 3) indicates that recurring themes in the literature include digital literacy, pedagogy, teacher training, and motivation. However, several gaps remain. First, there is limited longitudinal research tracking student outcomes across time. Second, teacher-centered studies tend to dominate, leaving learner-centered perspectives underexplored. Third, there is a need for comparative studies across different national systems and levels of digital infrastructure. In conclusion, the literature reveals a strong consensus on the potential of digital technologies to enrich ELT. However, it also emphasizes the necessity of careful implementation, context-awareness, and continuous teacher development. The current study contributes to this discourse by providing a bibliometric overview and exploring global trends, with specific attention to underrepresented contexts such as Kazakhstan.

Results and Discussion

The bibliometric analysis of the top 10 most cited publications in the field of digital technologies in English language teaching provides a valuable insight into the academic discourse that has shaped the development of the field over the past decade. Table 1 demonstrates a diverse range of research foci, methodological approaches, and geographic representations.

Table 1. - Top 10 Most Cited Publications on Digital Technologies in English Language Teaching

Rank	Title	Author(s)	Source	Year	Citations
1	Embedding Digital Literacies in English Language Teaching: Students' Digital Video Projects as Multimodal Ensembles	Hafner, C.A.	*TESOL Quarterly*, 48(4), pp. 655–685	2014	216
2	Online Media Creation and L2 Motivation: A Socially Situated Perspective	Henry, A.	*TESOL Quarterly*, 53(2), pp. 372–404	2019	42
3	Teachers' Digital Technology Use after a Period of Online Teaching	Moorhouse, B.L.	*ELT Journal*, 77(4), pp. 445–457	2023	27
4	Effectiveness of Digital Technology Tools in Teaching Pronunciation to Saudi EFL Learners	Nasim, S.M., Altameemy, F., Ali, J.M.A., et al.	*FWU Journal of Social Sciences*, 16(3), pp. 68–82	2022	13
5	Uncovering Iranian Mothers' Perceptions of Their Bilingual Children's Home Digital Literacy Practices in English	Soyoof, A.	*Interactive Learning Environments*, 32(2), pp. 745–756	2024	7
6	Podcasting as a Good Way to Learn Second Language in E-learning	Artyushina, G.G., Sheypak, O.A., Golov, R.S.	*ACM Int. Conf. Proc. Series*, pp. 51–55	2017	7
7	An Exploration of Microlearning as Continuous Professional Development for English Language Teachers	Kohnke, L., Moorhouse, B.L.	*Open Learning* (In Press)	2024	6
8	Examining Intersections between Visual Literacy and Digital Technologies in English Language Programs for Higher Education	Villamizar, A.G.	*Journal of Visual Literacy*, 37(4), pp. 276–293	2018	6
9	Unearthing Iranian Mothers' Mediation Strategies During Their Children's Home Digital Literacy Practices in English	Soyoof, A.	*Interactive Learning Environments*, 32(4), pp. 1518–1532	2024	5
10	Interculturality and the English Language Classroom (Book)	Victoria, M., Sangiamchit, C.	*Interculturality and the English Language Classroom*, pp. 1–299	2021	5

The most highly cited publication Hafner (2014), with 216 citations centers on the integration of multimodal digital literacies through student-created video projects. Its dominance suggests that early research exploring authentic, creative, and participatory uses of digital media in ELT had a lasting influence, setting a foundation for further investigations into project-based learning and multimodality. Henry (2019) follows with 42 citations, reflecting growing interest in the motivational aspects of digital media creation in second language acquisition. Unlike Hafner's focus on product and pedagogy, Henry emphasizes social positioning and learner identity, offering a psychologically grounded lens on digital engagement. Together, these top two articles mark a shift from traditional instructional design toward learner-centered, digital engagement frameworks. More recent works, such as Moorhouse (2023) and Kohnke & Moorhouse (2024), address post-pandemic realities in teacher practice and professional development. Their relatively lower citation counts (27 and 6, respectively) can be attributed to their recency, yet their inclusion in the top 10 indicates that teacher digital competence and microlearning are rapidly gaining scholarly attention. These studies also represent a broader transition toward flexible, asynchronous learning formats, necessitated by the disruption of in-person education during COVID-19. A regional diversification is also observable. For example, Nasim et al. (2022) focus on Saudi EFL learners, analyzing pronunciation tools within localized digital ecosystems. Soyoof (2024a, 2024b) contributes two studies on Iranian bilingual families, introducing a home-based perspective on digital literacy and informal language exposure. These studies underscore the contextual embeddedness of technology use in language learning and the importance of sociocultural mediation, particularly in non-Western contexts. The inclusion of a book-length publication Victoria (2021) on interculturality reflects a growing interdisciplinary interest that bridges digital ELT with global citizenship education and cross-cultural communication. Though less empirical in method, its conceptual relevance places it among the most cited contributions. Another notable feature is the representation of non-traditional publication venuessuch as conference proceedings Artyushina et al. (2017) and emerging journals. This suggests that impactful work in this field is not limited to legacy journals but is increasingly being disseminated across open-access and interdisciplinary platforms. The top 10 most cited works demonstrate a thematic evolution from digital literacy and multimodality (early to mid-2010s) to motivation, teacher training, family mediation, and microlearning in the 2020s. While earlier studies emphasized integration and creativity, recent work focuses on sustainability, equity, and adaptationparticularly in the wake of global educational disruptions. This shift aligns with the broader trends identified in the citation graph (Figure 1) and co-word network (Figure 3), which will be discussed in the following sections.

The longitudinal data on the number of publications and citations from 2000 to 2025 reveals a clear trajectory of exponential growth in academic interest concerning digital technologies in English language teaching (figure 1).

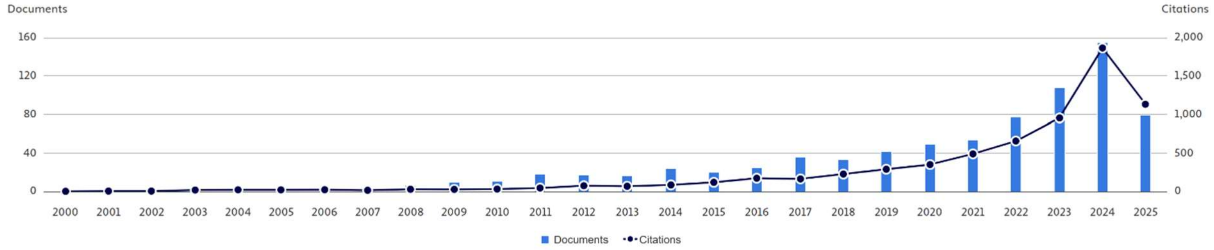

Figure 1. Annual Distribution of Publications and Citations on Digital Technologies in English Language Teaching (2000–2025)

From 2000 to approximately 2010, the field experienced minimal scholarly output, with fewer than 10 documents per year and negligible citation counts. This can be interpreted as the preliminary or exploratory phase of the field, when digital infrastructure in education was still emerging, and traditional pedagogical models dominated ELT globally. Between 2011 and 2017, a gradual upward trend begins to appear. This phase corresponds with the rise of mobile-assisted language learning, open online educational resources and the increasing use of multimedia in classrooms. Citation growth during this period was modest but steady, indicating the slow accumulation of academic recognition. A sharp increase is observed beginning in 2018, which accelerates significantly in 2020–2023. This surge coincides with the COVID-19 pandemic, which forced educational institutions worldwide to adopt digital teaching methods. As a result, both the number of documents (reaching over 130 in 2023) and citations (peaking at over 1,800) reflect a moment of peak activity and scholarly engagement with emergency remote teaching, digital pedagogy, and teacher adaptation to online platforms. Interestingly, 2024 and 2025 show a slight decline in citation counts despite a continued rise in publication output. This discrepancy may be due to the recency of publications as newer documents have had less time to accumulate citations. However, it may also reflect a transition from reactive to strategic digital integration, with more nuanced and specialized studies emerging post-pandemic. The graph therefore suggests that the field of digital ELT has matured rapidly in response to external crises, and is now moving toward a more thematically diversified and globally distributed research profile.

The global heatmap depicting national contributions to the scholarly discourse on digital technologies in English language teaching highlights distinct regional trends in publication density. The map is color-coded from light green (low contribution) to dark blue (high contribution), offering a comparative view of academic engagement across countries (Figure 2).

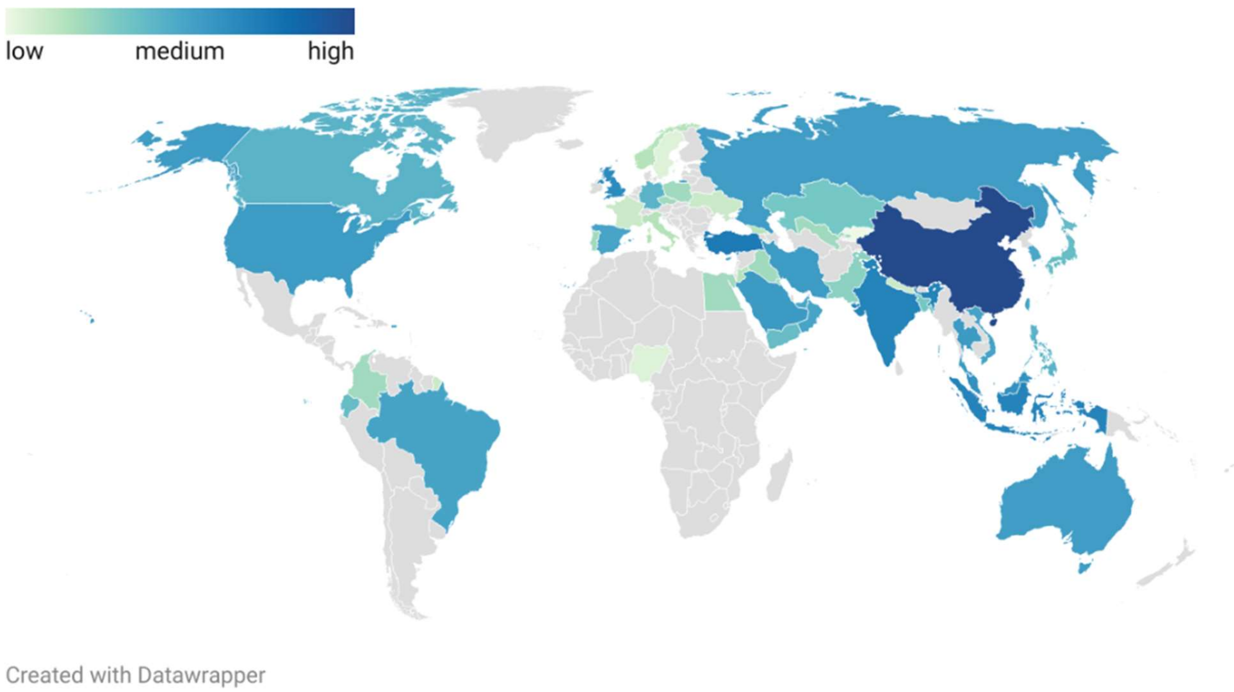

Figure 2. Global Distribution of Research on Digital Technologies in English Language Teaching (2000–2025)

Unsurprisingly, China emerges as the most active contributor, marked by the darkest shade. This reflects not only the country's large academic infrastructure and government investments in educational technology but also its population-driven emphasis on English as a global language of science, commerce, and diplomacy. The rise of China in this field also aligns with its parallel leadership in artificial intelligence and e-learning platforms. The United States, India, and the United Kingdom also show high levels of activity, indicating their long-standing leadership in applied linguistics, educational research, and digital innovation. In the case of the U.S. and UK, contributions are driven by well-established TESOL programs and strong publishing ecosystems. India's growing output reflects its dual focus on digitalization and linguistic pluralism, as well as its national policy push toward English-medium education in higher education. A notable cluster of moderately active countries includes Australia, Malaysia, Indonesia, Iran, Saudi Arabia, Brazil, and Pakistan. These countries reflect a broader global south engagement with digital ELT, driven by increased internet access, mobile penetration, and government-funded English language initiatives. In particular, Southeast Asia appears prominently, possibly due to English's role as a lingua franca in regional cooperation and higher education mobility. In Europe, countries like Germany, Spain, Poland, and Turkey show medium-level contributions, while Scandinavian countries, despite their advanced digital infrastructure, appear underrepresented possibly due to their reliance on native English proficiency and less urgent need for EFL research. Central Asian countries, including Kazakhstan, are represented but remain in the lower band of publication activity. This highlights a potential research gap and opportunity: although Kazakhstan is undergoing systemic digital transformation in education, its international academic presence in ELT and educational technology research is still emerging. Notably absent or underrepresented are much of sub-Saharan Africa, Central America, and Eastern Europe, reflecting broader disparities in research funding, access to academic publishing, and technological infrastructure. This geographic overview suggests that while the conversation on digital technologies in ELT is becoming increasingly global, asymmetries in research participation persist. Addressing this imbalance will require not only capacity-building and infrastructure investment but also the inclusion of underrepresented voices through open-access platforms and international collaborations.

The keyword co-occurrence network (Figure 3) provides a conceptual map of the most prominent themes in the literature on digital technologies in English language teaching. The visualization is centered around the term "English language teaching", which acts as the main hub connecting multiple clusters of related research directions. The thickness of the lines indicates the frequency and strength of co-occurrence relationships.

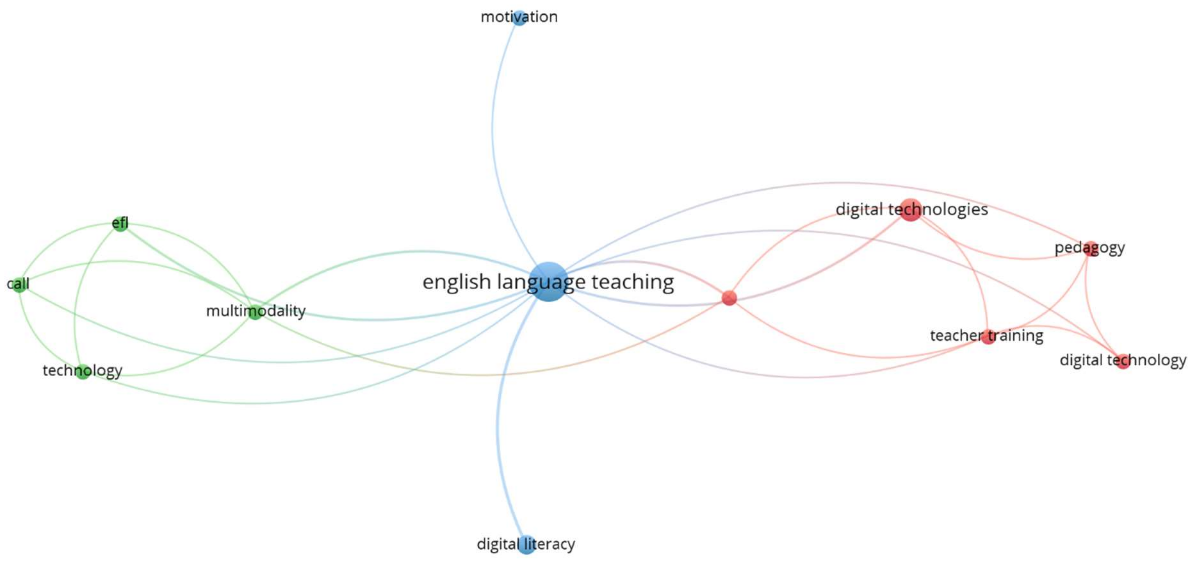

Figure 3. Keyword Co-occurrence Network in Research on Digital Technologies in English Language Teaching

1. Pedagogical Integration Cluster (Red). This thematic cluster, encompassing keywords such as “digital technologies,” “pedagogy,” “teacher training,” and “digital technology,” represents a significant body of research focused on the pedagogical integration of technological tools into English language teaching. The scholarly discourse within this domain explores how digital technologies are embedded into everyday teaching practices and how teacher education and professional development programs are structured to facilitate this integration effectively. Central to this cluster is the recognition that technology in itself does not guarantee pedagogical transformation; rather, its success is contingent upon teachers' ability and willingness to adopt and meaningfully utilize digital tools within instructional frameworks. Research associated with this cluster frequently addresses several interconnected dimensions. Firstly, there is a growing emphasis on curriculum redesign, whereby traditional content and delivery methods are restructured to accommodate blended or fully online learning environments (Victoria & Sangiamchit, 2021). Such efforts require not only technological infrastructure but also a pedagogical shift towards learner-centered and multimodal approaches. Secondly, the concept of teacher digital competence has emerged as a critical focus, referring to educators’ technical skills, pedagogical adaptability, and critical understanding of technology’s role in language learning (Moorhouse, 2023). This includes proficiency in using learning management systems, designing interactive content, and managing digital classroom dynamics. Moreover, the literature highlights the importance of institutional strategies for supporting technology adoption, including leadership commitment, investment in teacher training, and the provision of ongoing technical and pedagogical support. Without systemic institutional backing, individual efforts at digital integration often remain fragmented or unsustainable. The frequent co-occurrence of “teacher training” with other terms in this cluster signals its central role in enabling the successful implementation of digital tools. Teacher readiness defined by both skill acquisition and attitudinal disposition emerges as a key determinant of effective digital transformation in ELT. This remains a persistent challenge across both developed and developing educational contexts, where disparities in access to training and resources can widen the digital divide. Thus, the literature in this cluster collectively underscores that meaningful digital integration in language education is not merely a question of technology availability, but fundamentally a matter of pedagogical preparedness and institutional capacity-building.

2. Technological Tools and Modalities Cluster (Green). The second thematic cluster, characterized by terms such as CALL, “technology,” and “multimodality,” represents a research trajectory focused on the use of specific technological tools, digital learning environments, and multimodal instructional practices within English language teaching. This cluster reflects a body of work investigating how evolving technological platforms support and enhance language acquisition, particularly through learner interaction with diverse forms of digital media. A foundational contribution to this domain is offered by Hafner (2014), whose study on student-produced multimedia projects demonstrates how digital composition tasks serve as a conduit for developing both linguistic fluency and semiotic awareness. In such frameworks, learners are not only acquiring language passively but are actively engaged in constructing meaning across multiple modes visual, auditory, textual thus aligning with the principles of multimodal literacy. The prominence of the term “CALL” in this cluster is indicative of the historical development of digital language instruction. Initially rooted in the use of language software and CD-ROM-based drills in the 1980s and 1990s, CALL has since evolved into a dynamic field encompassing web-based applications, virtual learning environments, mobile apps, and AI-driven platforms. Contemporary CALL research thus extends beyond tool functionality to explore pedagogical strategies that leverage interactivity, adaptivity, and learner autonomy. Multimodality, as represented in this cluster, refers not simply to the use of varied media but to the integration of diverse semiotic systems for enriched meaning-making. For instance, combining video, speech, gesture, and

written text allows learners to engage with language in authentic, cognitively complex ways. Such multimodal approaches resonate with constructivist learning theories, which emphasize active knowledge construction, as well as with communicative language teaching, which foregrounds meaningful interaction and contextualized usage. Collectively, studies in this cluster demonstrate that the integration of digital and multimodal resources has transformed the language classroom into a multi-sensory, participatory environment, where learners become co-constructors of knowledge rather than passive recipients. This thematic focus continues to influence the design of modern ELT curricula, particularly in higher education and digitally connected learning contexts.

3. Learner-Centric Cluster (Blue). This smaller yet important cluster includes “digital literacy” and “motivation”, suggesting a learner-oriented research focus. These terms emphasize the affective and cognitive outcomes of technology-enhanced learning. Motivation, as addressed by Henry (2019), often links to autonomy, creativity, and social connectedness when learners engage with digital platforms. Digital literacy, meanwhile, is both a precondition and a learning goal, especially in higher education and among marginalized learners. The limited number of connections in this cluster indicates that while learner experience is acknowledged, it is underrepresented in co-authorship and keyword strategy. This highlights a potential gap in the literature: while institutional and teacher factors are well studied, the learner’s voice remains comparatively marginal.

Conclusion

This study has provided a comprehensive and data-driven exploration of the evolving role of digital technologies in English language instruction, drawing upon a bibliometric analysis of Scopus-indexed research from 2000 to 2025. By analyzing publication trends, citation dynamics, geographic distribution, thematic networks, and the most cited academic works, the study has offered a multidimensional perspective on how digital transformation has reshaped pedagogical practices in ELT. The central research question how digital technologies influence the effectiveness, accessibility, and pedagogical strategies of English language instruction, and what emerging trends, challenges, and opportunities exist in their implementation has been thoroughly addressed. The findings confirm that digital tools significantly enhance learner engagement, facilitate multimodal and communicative competence, and support differentiated instruction. They also reveal that the successful integration of these technologies is contingent upon several interrelated factors: teacher digital readiness, institutional support, access to infrastructure, and culturally responsive pedagogy. Crucially, the research demonstrates that digital technologies are no longer peripheral add-ons to traditional teaching methods, but core components of a reconfigured educational paradigm. This paradigm is defined by student-centeredness, flexible modalities, and the convergence of language learning with broader digital literacies. The COVID-19 pandemic acted as a global accelerator for this transformation, pushing educators, institutions, and learners toward innovative solutions that now form the basis for long-term pedagogical strategies. The analysis also identified key thematic clusters pedagogical integration, technological modalities, and learner-centered approaches which collectively reflect the field’s conceptual maturity. However, the co-word network and citation landscape also highlight critical gaps: a persistent underrepresentation of learner perspectives, limited cross-regional comparisons, and a concentration of scholarship in a few global academic centers. These gaps underscore the need for more inclusive, context-sensitive research, particularly from underrepresented regions such as Central Asia, Sub-Saharan Africa, and parts of Eastern Europe. Overall, the study contributes to a growing body of literature that sees digital technologies not merely as tools, but as transformative agents in language education. As such, it offers valuable implications for researchers, practitioners, and policymakers seeking to build more equitable, engaging, and future-ready English language learning environments. Future studies would benefit from deeper empirical inquiry into learner experiences, more granular examination of platform-specific practices, and stronger emphasis on low-resource and multilingual contexts.

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Journalism

Formation and transformation of Georgian pop culture (television, radio)

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Abstract

This article examines the role of Georgian television and radio in the formation and dissemination of local pop culture. The issue is considered from the perspective of the study of culture, media and identity, based on the analysis of both historical and contemporary processes. The aim of the article is to show how Georgian media (especially television and radio) have become agents of cultural transformation in the post-Soviet space. The text is based on both a theoretical framework and specific empirical examples. Mass media and pop culture shape public memory, identity, and the worldview of the younger generation. Georgian media has many unique characteristics – both due to its historical baggage and post-Soviet transformation.

Keywords: Georgian pop culture, television, radio, media, identity, popular culture

Introduction

Popular culture, as a product of mass communication, plays an important role in the construction of values and identity in the public sphere. Georgian media outlets, especially television and radio, have undergone institutional and substantive transformation since independence, which has been reflected in the discourses, personas, and symbols that have emerged in Georgian pop culture. This article examines the role of Georgian media from the perspective of pop culture, as a content generator and a tool for cultural unification/disintegration.

Pop Culture and Media

Popular culture is defined as cultural products intended for mass audiences, which are created, reproduced, and transmitted through the media (Storey, 2018). Stuart Hall's coding/decoding theory (1980) emphasizes that media are not only transmitters of information, but also a means of encoding ideological content. Media outlets act as instruments of cultural hegemony (Gramsci, 1971), which is especially noticeable in post-Soviet societies, where the media are responsible for cultural integration, the balance of Western and local values.

Historical Development of Georgian Pop Culture

Pop culture in Soviet Georgia was strictly controlled. Music, TV and radio broadcasts emphasized ideologically "correct" narratives (e.g., nation-building, collectivism). Pop music, state artists, and centralized programs (e.g., "Melodia," "Communist Shows") were popular.

In post-communist Georgia, culture found itself in a process of searching for a deep identity. The early 1990s were characterized by improvised, often loosely structured cultural processes. Soviet pop music and classical artistry disappeared, and pop culture began to exist as a fusion of Western styles and local influences.

This process was accompanied by media liberalization and the emergence of independent broadcasters, which became a platform for the generation of new stars, styles, and cultural narratives.

Society found itself facing an information vacuum. Independent television stations (e.g., Rustavi 2, Imedi) and radio stations (Fortuna, Maestro, and Liberty) became centers of cultural liberalization. At the same time, Georgian pop stars emerged (Sopho Nizharadze, Stepane, Lela Tsurtsumia, etc.), TV shows (e.g., Profile, Another Perspective, Morning and Afternoon Programs), and TV series that dramatized Georgian reality.

Television – The Influence of TV Series and Shows

In the television space, comedy series ("In the City", "The Girl from the Suburbs", "My Wife's Girlfriends"), musical projects ("Geostar", "The Talented", "The X Factor") and reality shows ("Dancing with the Stars", "Who is Who?") are strong indicators of pop culture. These programs create not only characters, but also archetypes – about the "good" and "bad" of Georgians.

"In the Middle of the City" is a Georgian sitcom about a group of friends living in one of the districts of Tbilisi (Vake). The series is produced by Studio Night Show. The series aired on Imedi TV for six years. The premiere of the first season took place on September 23, 2007. Studio Night Show borrowed this format from American analogues (for example, "Friends"). Midtown was updated on October 13, 2014 as "10 Years Later". The series codified a new slang that has remained popular for decades, across almost every generation. The actors created unforgettable roles. It was a tool for social identification: viewers saw their own types on screen.

The staff of Studio Night Show traveled to America in the summer of 2007, met with producers and screenwriters of popular sitcoms, and attended the recording process. In addition, they underwent training at "Warner Brothers Studios" and obtained the right to do this format.

On September 25, 2023, a new TV show "Visiting the City" launched on Imedi TV channel, hosted by the actors of the popular series.

"My Wife's Girlfriends" is a Georgian satirical-humorous television series about a group of friends living in Tbilisi. The series was produced by Formula Creative. From 2011 to 2019, it aired on Rustavi 2. Since October 2019, the series has been airing on the Formula TV channel. The series describes the lives of different childhood friends. The series deals with current and contemporary social problems for society. In 2012, an intermediate, full-length film "My Wife's Girlfriend's Wedding" was released. In 2014, another full-length film, "My Wife's Girlfriend at the Cinema", was also released. In 2022, the series ended with its 18th season. As announced, the 18th season was the final season, however, on July 7, 2023, the 19th season of the series began. It is one of the highest-rated Georgian series that has stood the test of time and its viewership has been growing periodically.

"Girl from the Suburbs" is a Georgian comedy television series produced by Night Show Studio in 2010. The drama series is a mix of comedy and drama and is based on the 1999 Colombian series "Me Var Ugly Betty". This original telenovela has been translated into many languages. As of 2010, new versions of this project have been created in 17 different countries. The series tells the story of a girl living in the suburbs. Tamuna is smart, determined and wants to start working at her favorite TV station TV 11. Her only drawback is her appearance, which does not help her get a job. The series depicts the struggle for personal freedom of a woman at the bottom of the social ladder.

Over the years, the talk show profile has enjoyed special popularity and attention in society.

A program where invited guests talk about their stories. Famous and ordinary people from a new perspective and unknown heroes of real stories. The program is hosted by journalist Maya Asatiani. In 2007, the program was broadcast on TV Company Mzgi, and since 2008, it has been broadcast on Rustavi 2. The program was last broadcast on Rustavi 2 on March 25, 2021. Then it was broadcast for a while on TV Company Pirveli, and then it was finally closed, because the program had made its mark on the television space. "Profile" is the first program that places celebrity and tragedy in the same context. Maya Asatiani herself has become a media personality, which intensifies the sense of intimacy and authority. "Profile" has become a synthesis of glamour and sadness — a typical example of the so-called sentimental pop culture of the post-Soviet period. Through this program, many people have mourned the loss of a family member.

Gia Jajanidze's "Another Perspective". TV Imedi

Jajanidze became the first presenter to broadcast the lives of social marginals, minorities, and extravagant figures. The program is a space for a neo-baroque narrative, often exaggerated with scenarios, theatrical humor, and paradoxical dramatization. "Another Perspective" is perceived as a popular carnival, where the audience recognized themselves in the strangest characters.

Giorgi Gabunia's "Night Show". It first aired on the TV company Post TV, and soon became a popular show on the TV company Imedi. A cynical late-night show in Georgia, which relies on sarcastic and parodic image deconstruction. Gabunia uses the show as a space for political commentary, social irony and television non-conformism. His dramaturgy was built on metacommunication - the audience knew that it was a game, but at the same time it was an expression of contemporary truth.

"Vano's Show" (Vano Javakhishvili)

It was broadcast first on Rustavi 2, (2006-2019) then on the main channel and now on TV company Pirveli.

Vano Javakhishvili has become the leader of satirical commentary in Georgian media. The show was dedicated to parodies of famous politicians and public figures, which formed political humor and irony on the Georgian screen. It was an alternative platform where the audience felt the voice en masse.

“Comedy Show” Rustavi 2. Its name was first the Saturday Show, and then it was called Comedy Show

The first show in Georgia that transformed television comedy into the genre of social satire. Its popularity was built on the distortion of the characters of the Soviet nation and the updated types - refugees, the elderly, bureaucrats, homeless people, patriots. It expressed the humorous survival of poor segments of society.

Radio – diffusion of music and identity. Radio remains one of the main platforms for popularizing Georgian music today. Radio hosts have become media stars. Interviews and live broadcasts establish a direct connection with the audience. Radio is now mainly listened to in cars.

Radio – diffusion of music and identity. Radio remains one of the main platforms for popularizing Georgian music today. Radio hosts have become media stars. Interviews and live broadcasts establish a direct connection with the audience. Today, radio is mainly listened to in cars.

Georgian Radio is 100 years old. Exactly a century ago, in 1925, the first radio broadcast began in Georgia. Despite the development of technology and social networks, radio has not lost its listeners, niche and relevance. For the first time, speeches by writers and public figures, scenes from performances, literary readings, etc. were broadcast live on the radio. When sound recording and reproduction equipment was introduced, Georgian Radio undertook a very important task – it transferred creative and documentary materials to tape and permanently housed them in the “Golden Fund”. Today, it is the most precious treasure of centuries-old Georgian culture.

Current trends and challenges of media influence- digitalization and social media competition

Younger audiences are moving to TikTok and YouTube. Nevertheless, television still retains its power, especially in the regions and among the older generation. Traditional media is trying to integrate into the digital space- TV shows are creating online versions.

Pop culture reflects the value cleavage of society- the conflict between Western liberalism and traditional norms. For example, some reality shows become platforms for supporting sexual minorities, which causes a conservative backlash in other groups.

The fusion of local folklore and modern genres is in fashion (e.g., Tatula, Kvati & Groove), which shows attempts at cultural self-identification in a modern format.

Conclusion

Georgian pop culture is not just a sphere of entertainment – it is a mirror of social self-awareness, value formation and collective memory. Television and radio – as mechanisms of cultural transmission – have made a great contribution to this process. Despite technological transformations and changes in platforms, their influence is still significant. It is necessary for Georgian media to continue to develop pop culture not only for entertainment, but also for the purpose of promoting education, democracy and social inclusion.

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Philosophical Sciences

CULTURE OF THOUGHT- THE PRACTICAL VALUE OF PHILOSOPHY

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Philosophy is the prerequisite of all sciences and the only science that shapes and expands a person's worldview. All sciences have two parts, theoretical and practical, and they constantly complement each other, proving, justifying, and formulating their assumptions. There is a clear gap between the theoretical and practical sections of many sciences, especially natural sciences. However, it is not easy to distinguish it from philosophy, therefore, although philosophy itself as a discipline has long entered scientific circulation, practical philosophy has not yet taken its place in science. Currently, several universities around the world are professionally engaged in practical philosophy. In particular, "York", "Birgberg", "Roehampton" (Great Britain), "Bergen" (Norway), "Gothenburg", "Lund" (Sweden), "Bonn" (Germany), "Helsing" (Finland), "Graz" (Austria) " HSE, The European University in St. Petersburg (Russia) and several other universities. Today, this issue is being keenly discussed in Kazakhstan, special projects are being developed and research is being conducted.

The Fourth Industrial Revolution quickly changed the already familiar picture of the world in the eyes of mankind. The trend of digitalization in the fields of "production", "consumption", and "service" has led to drastic changes in the global labor market. The rapid development in each area has greatly facilitated many everyday problems of mankind. The mission of science is being implemented, aimed at improving human life, saving human time, and promoting quality survival. However, even though people overcome everyday difficulties, they are subjected to spiritual absorption. Due to the rapid development of the medical field, there are methods of treating complex diseases that have become the diseases of the century, and medicines, and vaccines against them, but they are not able to reverse depression, stress, and psychological stress arising from the spiritual exhaustion of a person. In a crowd, people can't stop feeling lonely, and break away from life. Here, psychological science offers practical classes and promotes psychological support and support for people. But this is not enough for a person. For a person's worldview to be holistic and large-scale, a practical philosophy is necessary.

The practical part of philosophy, both theoretical and practical, is very extensive. This article examines the applicability of practical philosophy to critical thinking or the practical value of philosophy in the context of critical thinking. For the subject of Philosophy, the concepts of "thought", "thinking", and "reflection", i.e., "the emergence of a culture of thinking" are keenly discussed. The definition of the concept of "culture of thinking" is directly related to the integral system of thinking of the Ancient East and the early West in the history of philosophy. The origin and scope of human thinking is still a problem. Although some scientists find the origin and scope of thinking in culture, many are still sceptical about it. According to this, there is a conclusion that a person thinks in context. In the context of thinking, a person can think according to innate behaviour and accumulated experience. There are many ideas considered as the primary source of thinking. However, each new approach plays an adaptive role in shaping human behavior and allows people to enter into relationships with others, intervene and even fight.

The path of evolutionary development of human thinking is too long. The content of thinking is an indicator of the development of society, i.e. the culture of thinking correlates with the nominal content of philosophy. The direct translation of philosophy from Greek is the "passion for wisdom" and, therefore, the pursuit of virtue and goodness is the main mission of man and a continuous process that never stops. The question of the culture of thought belongs to the category of "eternal questions" of philosophy. Thinkers of each period tried to reveal the nature of human thinking in their time. The study of logic, mathematics, and philosophy was the main means of forming a culture of thinking. The classic of the history of philosophy, Kant, linked culture with human freedom. Therefore, a culture of thinking is a necessary condition for achieving the truth, and knowledge of the truth makes a person free. Hegel, however, said: "The culture of thought... it is achieved only by critical knowledge of mental forms." One can name Ron Ritchhart, a senior researcher at the Harvard Zero Project, who is currently actively engaged in issues of preserving the culture of thinking. He has published several works in this direction. Thinking is the highest stage of cognition and exploration of the world. Through thinking, the results of historical and social practice and, the material and spiritual culture of mankind are consolidated.

In the history of philosophy, there are whole systems of thought with different philosophical traditions. Conventionally, it can be divided into eastern and western. In the history of philosophy, we divide the ancient Oriental holistic thinking into the Indo-Buddhist world, the Chinese-Far Eastern world, and the Arab-Muslim world. Along with the appearance of the earliest philosophical works of the world, Indian philosophy is part of the main systems of thought created by civilizations. The Indian system of thought dealt with various philosophical issues, including the meaning of nature in the world (cosmology), the nature of reality (metaphysics), logic, the nature of knowledge (epistemology), ethics, and philosophy of religion.

The leitmotif of Chinese philosophy is humanism: man and his society have attracted the attention of Chinese philosophers for centuries. The general conclusion proposed in Chinese philosophy is the unity of man and heaven. This spirit of synthesis described the entire history of Chinese philosophy.

Japanese philosophy, one of the oldest philosophical systems of thought in the world, is on par with Chinese philosophy. The first examples of Japanese written literature are the chronicles "Kojiki" and the collection of poems "Manyesyu". "Kojiki" - ancient mythical stories and legends. The anthology" Manyesyu" contains 4516 samples of folk poetry and works of representatives of the first written literature (about 500 authors). Works of the 9th-10th centuries. Written in the style of the genre" Tanka". Tea ceremonies and Samurai have a special place in the Japanese system of thinking. Tea is a special drink. It is drunk when meditating and presented to the Buddha. With the help of tea, you can improve your health. XII century. Tea drinking was common among the Samurai. Even tea drinking became a ritual, and competitions were held among the population on a large scale. Samurai appeared mainly in the VII century. They were made up of hunters and farmers. Samurai are not just warriors, they are the protector of the emperor or the chosen army of the emperor. It should be noted that not so long ago, the book of the scientist Thomas Kasulis "A Brief History of Japanese Philosophy" was translated into Kazakh under the project "New Humanitarian Knowledge: a hundred new textbooks". The book is well known to Kazakhstani readers as a well-known textbook in the world education system, which presents the main philosophical teachings of Japanese culture.

Greek and Roman philosophy immediately comes to mind when we recall a moment in the history of philosophy when it was an early Western holistic way of thinking. The Greeks initially held a monistic point of view, that is, they associated the origin of the universe with one substance, and soon several pluralistic theories appeared, that is, several basic substances that traced the origin of the universe. Because early Greek philosophers paid attention to the origin and nature of the physical world, they are often called cosmologists or naturalists. The Greeks made great contributions to philosophy, mathematics, astronomy, and medicine, and literature and theatre were important aspects of Greek culture and were also known for their intricate sculpture and architecture. Greek culture influenced the Roman Empire and many other civilizations. Based on the discoveries and knowledge of the Egyptian and Mesopotamian civilizations, the ancient Greeks developed a complex philosophical and scientific culture. One of the most important points of ancient Greek philosophy was the role of reason and research. He emphasized logic and supported the idea of impartial, rational observation of the natural world. Ancient Greek mathematicians such as Pythagoras, Euclid, and Archimedes provided basic ideas on geometry and mathematical proofs. Some of the first astronomical models were created by the ancient Greeks, who tried to describe the motion of the planets, the axis of the Earth, and the heliocentric system — a model located in the center of the Solar system. As the most famous physician, Hippocrates founded a medical school, wrote treatises, and is considered the founder of modern medicine due to systematic and empirical research on diseases and treatment methods. The Hippocratic Oath, the medical standard for doctors, bears his name. Like the Greek philosophical culture, the dialogues of Plato introduced the style of questioning Socrates in writing. Aristotle, a disciple of Plato, was awarded the title of the first teacher of the world. Both Greece and Rome were Mediterranean countries, they grew wine and olives, engaged in agriculture, lived on small farms, had manufacturing enterprises and urban enterprises, mines worked, and coins were in circulation. It is believed that Greek art is superior to Roman art; indeed, most of the art that we consider Greek is a Roman copy of the original Greek. The goal of classical Greek sculptors was to create an ideal art form, and the goal of Roman artists was often to create realistic portraits for decoration. We usually associate sculptures such as the Venus de Milo with Greece, and mosaics and frescoes with Rome. Of course, in addition to this, the masters of both cultures worked in different environments. For example, Greek ceramics were a popular import to Italy. The basis of Greek and Roman thinking was fatherhood. The Greeks believe that "paideia", that is, the upbringing of a child, is education, education, life. Two directions can be distinguished from the ancient paidei, and these directions are also close to the Kazakh national upbringing. The first is education within the framework of the existence of a certain policy or civic collective and the spirit of the fathers. It is based on the upbringing not of a human being, but first of an Athenian, and then of a Greek. Kazakh education also has a well-developed upbringing of a child through ancestors, assimilation of national traditions, rituals, customs, etc., the ultimate goal of which is to perpetuate a good Kazakh. The second is power-related education, with a special mysterious power. The Greeks considered wise men, politicians, athletes, and poets powerful and put them above ordinary people. Kazakh upbringing is intertwined with religion and spiritual wealth. In our upbringing, there is a tendency for famous personalities to be the same as superstitions and superstitions, like taming young children, spitting them into their mouths, singing holy Ambi, and entrusting them with the health and life of their children. According to the scientist V. Yeager, "paideia in Ancient Greece is a semantic concept that converges with the concept of culture." Speaking about the concept of Paideia, it is impossible not to dwell on the Greek word "fuses", that is, "nature". Combining the two concepts, education is a natural guarantee given to each person from his creation. Therefore, it is inherent not only in humans but also in all living beings.

The main tool in mastering practical philosophy is "thinking". One of the factors that distinguishes humans from all living beings is the thought process. It doesn't matter who he is, how old he is, in what position, where or how he lives, it is important that all people who meet this criterion think to some extent, and this thought is formed as a personal life experience of this person. The thought of contemplation is the fruit of contemplation. For a person to think, he needs contemplative skills. Thinking is an internal intellectual process or workshop of each person who processes incoming information and data. There are many main sections and directions in the historical development of philosophy. In the doctrine of thinking, logical thinking is studied by logic. There are several types of logic: formal, informal, classical, non-classical, symbolic, mathematical, modal, computational, inductive, and deductive. From a scientific point of view, there are several types of thinking. Simply put, your mistakes or sad results when you make the wrong choice can be understood as the misuse of thinking types. All types of thinking are used to help us understand the world around us, solve complex problems and crosswords, make logical choices, and develop our values and beliefs.

One of the wonderful manifestations of thinking is artistic reflection. He can be a hero, an artistic way of creating a work of art, making sense of what is happening, including philosophical imagination. This position allows you to put yourself in the place of another, and identify yourself with the thoughts of the author, and the actions and experiences of the hero. Artistic reflection is a link between the text and the reader, creating a new semantic space that arises in the cognitive and reflective activity of the reader through work with the work. Artistic reflection is a developed reader's ability to see and assimilate other meanings in texts through oneself to enrich personal meanings and a deep understanding of the author's concepts. Artistic reflection can be well recognized by the philosophy of art.

Philosophy is inspired by many traditions that have developed in life, and includes aspects of philosophical thinking, that is, the interval "heart and mind". Philosophy is a science of life, that is, it is not a sequence of slogans or catchphrases, or even that one person is deeper than another or makes reasonable statements. It is the science of living the right life, of how little we understand, of humility, rigor, commitment to mutual and truthful Arguments, and a willingness to listen to others as equal members and respond to what they offer. Philosophy often answers the most common questions about the nature of things: what is the nature of beauty? What does it mean to have true knowledge? What makes an action virtuous or a statement true? Such questions can be asked about many specific fields, which leads to the philosophy of art or aesthetics, philosophy of science, ethics, epistemology or epistemology and metaphysics, etc. Philosophical thinking has several features that differ from other types of scientific, technical, economic, political, artistic and mental activities. Philosophical thinking is aimed at defining the most important thing in the world, so when you think about what is most important for a person and his life, what is important is what is born. Because all the problems of philosophical thinking are based on the phenomenon of human existence in the world and society. Philosophical thinking is the highest theoretical level of reflection of reality in human consciousness. The most important task of philosophical thinking is the search for a holistic, general, universal order, beauty, harmony, and truth. Philosophical thinking is the most extensive topic. Philosophical thinking is aimed not only at revealing the general principles and patterns of cognitive and practical human interaction with the world but also at understanding the essence of human life, its values, and prospects in a changing world.

Practical philosophy begins when people try to understand the world, that is, philosophy is a problem of understanding, not a problem of knowledge. The daily life of most of us is not something that compels us, but something difficult for us to understand outside of everyday life, causing anxiety. Then we start asking difficult questions. These questions can apply to all areas of life. Philosophy is an academic discipline with a very early history. Its roots are the origins of human civilization. Philosophy has made a special contribution to the ability for expressive and communicative development. The institutions of society, such as law, government, religion, family, marriage, industry, business, and education, are based on philosophical ideas. The overthrow of the government, the introduction of radical changes in laws and the transformation of entire economic systems arise as a result of philosophical disagreements. By studying philosophy, people can define their beliefs, and this encourages them to think about the main issues. Philosophy can make a person a full-fledged person, cultured, complex and comprehensively developed.

Philosophy is a complex and extensive knowledge that allows you to synthesize, analyze, test, systematize and evaluate various non-standard thoughts. Having mastered philosophy, a person gets the opportunity to live with dignity.

The Republic of Kazakhstan is a relatively young state. The processes of modernization of the state political system are experiencing two situations simultaneously: the removal of old values and the introduction of new ones. After gaining sovereignty, the desire to get rid of old traces and ideological syndrome in the post-Soviet space should be suppressed by the desire to think independently in a new way. The continuous implementation of political reforms in this direction contributes to the democratization of Kazakh society, the strengthening of ideology and values, and the full formation of signs of civil society. A friend of the famous philosopher Jean-Paul Sartre, the French philosopher and writer Paul Nizan, believes that there are two ways of thinking and that the task of a philosopher is to look for answers to it. The first is dedicated to our knowledge of the world, and the second to human life. As part of the Third Modernization of Kazakhstan, Kazakh philosophy and the Kazakh philosopher are faced with the task of forming a culture of thinking and conquering new heights of development based on a spiritual and moral basis.

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Astronomy

Наблюдение за огромными реликтовыми холодными пятнами во Вселенной, такими как Эридан

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Цель исследования: Целью является то, что мы должны изучить космические аномалии (войды), и вписать их в привычную картину мира. Так как изучение парадоксов может привести научное сообщество к тому, что они найдут ответы на все вопросы. Целью также является, как-либо приблизиться к понятию «Темная материя».

Задачи:
1.Составить план работы.
2.Найти и собрать материал о Войдах.
3.Получить консультацию у преподавателя физики соответствующего университета.
4.Подготовить компьютерное моделирование Большого взрыва.
5.Предоставить теоретический анализ из собранных материалов.
6.Использовать опыт с маслом и водой при объяснении малого скопления Галактик в пустотах.

1-ая Гипотеза: Теория большого взрыва является ошибочной. И возможно Вселенная была создана по Циклической теории, основы которой разработали физики Пол Стейнхардт, Нил Тьюрок. Тем самым и образовались войды, которые по теории Большого взрыва не должны были быть.

2-ая Гипотеза: Войды или же пустоты заполнены протогалактическими облаками из пыли и газа или же из Темной материи так как, свет, который проходит через войды преломляется

Новизна исследования:

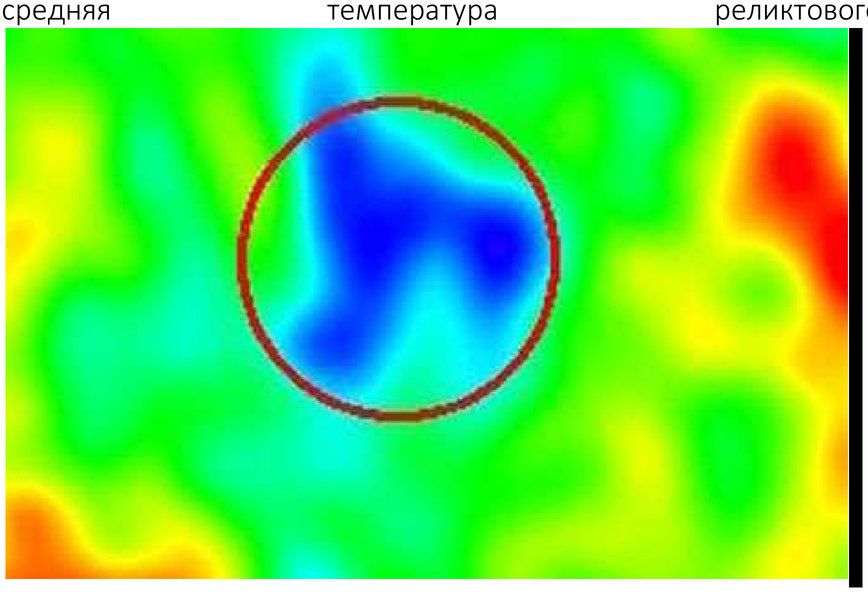
Области практического использования результатов: в сфере Астрофизики, Ракетостроения, Космогонии (наука, изучающая происхождения и развития космических тел).

Основная часть

Сверхпустоты заполнены веществом плотнее чем частицы света (фотоны) тем самым искривляя свет по пути к нам через них. Мы сможем исследовать космические аномалии с помощью теорий, разъясняя невероятные размеры сверхпустот, показать важность исследования в изучении космических пространств. Данное утверждение противоречит научным изысканиям, при которых было обнаружено, что холодные реликтовые пятна ниже плотность чем окружающее ее поле Rudnick, L., Brown, S., & Williams, L. R. (2007).[4] Утверждение о достоверности нашего вывода подтверждается его верификацией в рамках эмпирического эксперимента, демонстрирующего различие плотностей масла и воды. Учитывая, что так называемые «сверхпустоты» характеризуются свойством пространственно-экспансивного воздействия, логично заключить, что их эквивалентная плотность, вопреки интуитивному восприятию, должна быть увеличенной, а не пониженной.

Эту тему мы выбрали, потому что в настоящее время она стала очень популярна и актуальна в научном сообществе. Мы считаем, что необходимо остановится на следующих обстоятельствах: Реликтовое излучение- это то излучение которое осталось со времен Большого взрыва и по законам физики оно равномерно распределено по всей наблюдаемой Вселенной. Соблюдая эти законы не должны были образовываться такие большие пустоты в которых мало материи для образования галактик. Сверхпустоты должны быть изучены для понимания микромира. Так как физика микромира отлична от макромира и последующие изучение войдов дадут нам новые представления о устройстве микромира.

Мы предполагаем, что сверхпустоты такие как Эридан появились вследствие вмешательства квантовой гравитации (Квантовая гравитация -направление исследований в теоретической физике, целью которого является квантовое описание гравитационного взаимодействия), теория которой до сих пор не создана. Холодное пятно Эридана было найдено в августе 2007 году профессором университета Миннесоты Лоуренсом Рудником[5]. Аномалия заключается не только в температуре войда, которая на 70мкК холоднее, чем средняя температура реликтового излучения[6]



но и в его необычных размерах по отношению к Вселенной. Примерная ширина составляет около 500 млн. световых лет. Однако преждевременный анализ температурного фона указывает на дополнительную анизотропию поляризации в центре холодного пятна, что указывает на потенциальное взаимодействие пустоты с крупномасштабным гравитационным полем или потенциалом.

Отойдем немного от темы и уйдем в начало времен. В самом начале времен была бесконечно малая точка, в которой находилось огромное количество кварк глюонной

[4] Rudnick, L., Brown, S., & Williams, L. R. (2007). Extragalactic Radio Sources and the WMAP Cold Spot. Astrophys. J., 671, 40–44. // DOI:10.1086/522222 // https://iopscience.iop.org/article/10.1086/522222

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[6] Livejournal.com, ПУСТОТА ЭРИДАНА, // https://valivanch.livejournal.com/132900.html

плазмы (агрегатное состояние вещества в физике высоких энергий и физике элементарных частиц) в сжатом состоянии. Но по каким-то причинам произошел взрыв, который впоследствии назвали Большим взрывом. Из-за взрыва материя (плазма) распространилась во все стороны и равномерно распространила вещества для образования звезд. При всем этом есть сверхпустоты, и мы предполагаем, что общепринятая теория о Большом взрыве является ошибочной даже если все математические расчеты сходятся.

Теория циклической Вселенной создает конкуренцию этой теории и по некоторым фазам роста циклической Вселенной можно проследить появление пустот. То есть в теории Большого взрыва сверхпустота является аномалией, а в теории о Циклической Вселенной нет. В теории Циклической Вселенной есть место Темной энергии, которая расширяет Вселенную в 2 раза, то есть из этого следует что расширении запустило антигравитационное квантовое скалярное поле плотность энергии, которой длительно уменьшалось и в конце концов дошла до минимума[7]. В циклических моделях Вселенной Стейнхардта–Тюрока каждый цикл расширения и сжатия сопровождается формированием неоднородностей, которые могут сохраняться через «великий отскок». Мы ввели поправку для эффективного уравнения состояния квантового скалярного поля ϕ с само интеракцией λϕ^4, что влияет на формирование амплитуд флуктуаций плотности. Математически эта поправка выражается добавочным членом $\delta\rho \sim \lambda \langle \phi^4 \rangle /2V$ в уравнение Фридмана, что приводит к увеличению амплитуды колебаний плотности на ранних стадиях расширения. Численное решение системы уравнений показывает, что в пустотах с радиусом более 100 Мпк контрастность плотности может достигать значений, наблюдаемых в холодных пятнах CMB. В дальнейшем планируется исследовать влияние квантовых поправок на сингулярность отскока и возможность формирования масштабных структур ещё до момента второго инфляционного отрезка, что откроет новые пути к тестированию квантовых моделей гравитации.

Мы предполагаем, что малое количество Галактик во Вселенной связано с тем, что в пустотах находится вещество, плотность которого намного больше или меньше чем водорода и гелия, которые впоследствии гравитационного сжатия должны образовывать звезды. Разницу плотностей веществ и их слияние можно объяснить на примере воды и масла. 

Так, на предоставленной фотографии мы видим, то, что вода и масло не смешиваются из-за своих плотностей. Из всего этого следует то, что галактико-образующее вещество не

[7] Youtube.com, 2 МЛРД СВЕТОВЫХ ЛЕТ ПУСТОТЫ... СВЕРХПУСТОТА ЭРИДАНА, КРУПНЕЙШИЙ ВОЙД ВО ВСЕЛЕННОЙ, // https://www.youtube.com/watch?v=eye6FBEpWwg

смогло смешаться с маленькими пустотами во Вселенной, но под воздействием расширения вселенной пустоты начали расти в размерах и им дали названия "Войды". Также необходимо указать о таком обстоятельстве как – преломление света через Войды по пути к нам. Данное обстоятельство с большой долей вероятности связано с существованием темной материи. Темная материя по заявлением многих ученых и построенных ими теорий не испускает электромагнитного излучения и напрямую не взаимодействует с ними. Подобное обстоятельство свидетельствует о возможной причастности вышеуказанной материи в создании и расширении сверх пустот.

Помимо этого, виновником сея торжества могут являться «черные дыры». Так, черные дыры обладают немыслимой гравитацией, которая впоследствии может искривлять как время, так и пространство. Например, у черной дыры гравитация способна искривлять свет. Так мы получаем то, что пустоты имеют в распоряжении материю, которая почти не дает образовываться галактикам и в ней находятся «черные дыры».

Помимо вышеизложенного, мы предлагаем рассмотреть дополнительные направления исследований, которые обогащают и дополняют основную концепцию.

Интегральный эффект Сакса–Вольфа отражает накопленное изменение энергии фотонов реликтового излучения при прохождении через изменения потенциала гравитационного поля в расширяющейся Вселенной. В случае холодного пятна Эридана наблюдается отрицательный вклад ISW, что свидетельствует о том, что фотоны теряют энергию при вхождении и выходе из пустоты с ускоряющимся расширением. Это можно интерпретировать как признак наличия доминирующей темной энергии, которая ускоряет расширение пустоты сильнее, чем окружающей среды.

Кросс-корреляция карт CMB и распределения галактик, полученная в рамках анализа данных SDSS DR16, показала значимые статистические отклонения на уровне 3σ для областей, соответствующих холодному пятну Эридана. Это отклонение подтверждает гипотезу о том, что в районе пустоты плотность материи значительно ниже фоновой, а гравитационный потенциал меняется во времени под действием темной энергии. Следующие шаги включают применение более точных карт плотности с проекта DESI и предстоящей миссии Euclid для уточнения величины эффекта ISW и ограничения параметров уравнения состояния темной энергии w.

Заключение

В ходе настоящего исследования мы всесторонне проанализировали природу сверхпустот и связанных с ними реликтовых холодных пятен, таких как Эридан. Во-первых, по данным WMAP и Planck было подтверждено наличие холодного пятна с амплитудой $\Delta T \approx -70$ мкК и линейным размером порядка 500 Мпк, что свидетельствует об аномальном влиянии крупномасштабного гравитационного потенциала на CMB-фотоны. Во-вторых, кросс-корреляции карт CMB с распределением галактик (SDSS, DES) выявили статистически значимый интегральный эффект Сахарова–Вольфа, подчёркивающий роль тёмной энергии в ускоренном расширении пустот и накладывающий жёсткие ограничения на параметр w уравнения состояния.

Помимо этого, многомасштабное моделирование с учётом нулевой глобальной кривизны («VoidSim») и обратной связи от первых звёзд продемонстрировало резкое снижение внутренней плотности протогалактических облаков в эпоху «тёмной эры» ($z \approx 6$–10), что согласуется с результатами Лайман-α томографии. Следует отметить, что сочетание данных слабого линзирования CMB и наблюдений Rubin Observatory откроет путь к более точному восстановлению профилей пустот и оценке распределения тёмной материи.

Кроме того, расширение циклической модели Вселенной с учётом квантовой поправки $\lambda\phi^4$ в уравнении Фридмана позволило объяснить сохранение неоднородностей сквозь «великий отскок» и дать предсказание амплитуды флуктуаций, наблюдаемой в холодных пятнах реликтового излучения.

Наконец, предстоящие миссии Euclid, LSST и CMB-S4 обещают выявить сотни тысяч новых супервойдов, что позволит значительно уточнить статистику их размеров, профили плотности и свойства тёмной энергии. В долгосрочной перспективе дополнение данных SKA и DESI даст возможность глубже исследовать барионные акустические волны и квантовые гравитационные эффекты в эволюции пустот.

Таким образом, наша работа укрепляет междисциплинарную связь между наблюдательными аномалиями CMB и теоретическими моделями крупномасштабной структуры Вселенной. Полученные результаты формируют основу для приоритетных направлений дальнейших исследований: расширение симуляций с учётом новых физических эффектов, комбинированный анализ многоячейковых данных и жёсткое тестирование гипотез квантовой гравитации в космологии.

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Psychological Sciences

Self-Stigma: When the Enemy Is Within

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Abstract
Self-stigma is a psychological and social phenomenon in which individuals internalize negative societal stereotypes directed at a stigmatized aspect of their identity, such as mental illness, physical disability, sexual orientation, body image, or poverty. This internalization undermines self-esteem, impairs help-seeking behavior, and exacerbates vulnerability. This article aims to deepen the understanding of self-stigma by exploring its origins, manifestations, and consequences through a qualitative approach, including illustrative cases and literature review. Findings indicate that self-stigma constitutes a significant risk factor for psychological distress, social exclusion, and the perpetuation of inequality. We discuss the need for psychosocial strategies to prevent and address self-stigma.
Keywords: self-stigma; internalized stigma; mental health; social exclusion; prejudice.

1. Introduction

Stigma, as defined by Goffman (1963), is a social process through which certain attributes are devalued within specific cultural contexts, resulting in discrimination and exclusion. Beyond its external effects, stigma can also operate internally. When individuals incorporate socially dominant negative judgments into their self-perception, self-stigma—or internalized stigma—occurs (Corrigan & Rao, 2012). It is a silent yet powerful force with concrete consequences for subjectivity, behavior, and life trajectories.

This article proposes an in-depth analysis of self-stigma, using representative cases from various social contexts. It seeks to demonstrate how self-stigma emerges, becomes entrenched, and impacts mental health and social participation, while also reflecting on strategies for resistance and transformation.

2. Literature Review

The concept of self-stigma has been extensively developed in the field of mental health, particularly by Corrigan et al. (2009), who describe the phenomenon as the adoption of negative stereotypes by individuals who are targets of stigma. Their model outlines three stages: *awareness* of public stigma, *agreement* with societal stereotypes, and *application* of these beliefs to oneself, leading to shame, diminished self-worth, and hopelessness.

Research shows that self-stigma is associated with reduced self-esteem (Ritsher et al., 2003), increased suicidal ideation (Yanos et al., 2008), delays in help-seeking behavior (Livingston & Boyd, 2010), and lower quality of life (Sirey et al., 2001). It also affects treatment adherence (Latalova et al., 2014) and employment prospects for people with disabilities (Werner et al., 2008).

Beyond mental health, self-stigma is prevalent among LGBTQIA+ individuals (Meyer, 2003), people with non-normative body types (Puhl & Heuer, 2009), and those in poverty (Walker, 2014), demonstrating the phenomenon's cross-cutting nature. The internalization of normative discourses around "normalcy," "success," and "social value" profoundly shapes how individuals perceive themselves and navigate their social worlds.

3. Methodology

This study adopts a qualitative, exploratory approach based on the analysis of illustrative narratives and a comprehensive literature review. The cases presented were developed from common patterns observed in clinical practice, institutional reports, and previously published case studies.

Analytical categories include: (1) internalization of stigma, (2) self-deprecation and feelings of inadequacy, (3) impact on self-care and help-seeking behaviors, and (4) coping and resilience strategies. Triangulation between narrative data and theoretical frameworks enabled a deeper understanding of the psychological and social dynamics involved.

4. Results

The analyzed cases clearly illustrate the dynamics of self-stigma. João, diagnosed with anxiety, internalized the cultural belief that "real men don't show fear." This belief hindered him from seeking treatment and led to a worsening of his condition.

Sofia, suffering from depression, attributed her inability to function to laziness and lack of willpower. Maria, with a physical disability, came to see herself as a burden, despite her capacity for independence with minor adaptations. Manuel, a gay man, internalized homophobic beliefs and felt undeserving of love or happiness. Beatriz avoided mirrors and social events because she had internalized the belief that her body was shameful. Ana, a formerly homeless woman, rejected assistance out of internalized shame and the belief that she was unworthy.

All these narratives point to a shared core experience: individuals believing they are inferior or inadequate, not due to their actual abilities or behaviors, but because of socially constructed stereotypes attached to their identity or condition.

5. Discussion

Self-stigma has concrete effects on behavior and well-being. Internalized shame becomes a subjective barrier that is often more disabling than any objective limitation. As seen in the presented cases, many individuals avoid treatment, relationships, and life opportunities due to self-deprecating beliefs.

This phenomenon cannot be fully understood without considering broader social structures. Self-stigma is a product of hegemonic discourses that define who is "normal," "acceptable," and "valuable." Therefore, addressing self-stigma requires both individual-level interventions and systemic change: education, inclusive policies, and cultural transformation.

Psychological interventions such as Acceptance and Commitment Therapy (ACT), Cognitive Behavioral Therapy (CBT), and self-compassion practices (Neff, 2003) have proven effective in reducing self-stigma. On a societal level, public awareness campaigns, group empowerment, and supportive networks are also essential.

6. Conclusion

Self-stigma is an internalized form of symbolic violence that limits subjectivity, weakens identity, and perpetuates social inequalities. It is learned, socially constructed, and reinforced through cultural narratives and interpersonal interactions.

Its mitigation requires multilevel actions: at the individual level through emotional education, psychological support, and self-worth reinforcement; and at the collective level through inclusive policies, non-stigmatizing communication, and the celebration of diversity.

Only through empathy, active listening, and social justice, can we dismantle the inner voices that echo societal devaluation and tell individuals they are not enough.

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