

ECONOSCITECH INTEGRATION

ISSUE
6

INTERNATIONAL SCIENTIFIC
ELECTRONIC JOURNAL



**TASHKENT STATE
UNIVERSITY OF ECONOMICS**



**American University
of Technology**

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ISSN: 3060-5075



**Acceptance of articles
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THE SCIENTIFIC-POPULAR
ELECTRONIC JOURNAL
"ECONOSCITECH-INTEGRATION"
HAS BEEN REGISTERED UNDER
THE NUMBER C-5669651 BY THE
AGENCY FOR INFORMATION AND
MASS COMMUNICATIONS (AOKA)
OF THE REPUBLIC OF UZBEKISTAN,
EFFECTIVE FROM OCTOBER 9, 2024.

In accordance with Resolution No. 384/6 dated April 10, 2026, issued by the Presidium of the Supreme Attestation Commission under the Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan, this journal is included in the list of recommended international scientific publications for publishing the primary research findings of doctoral dissertations in the field of Economic Sciences.

Partners: Tashkent State University of Economics / American University of Technology in Tashkent (AUT)

Electronic publication, Issue 6. 374 pages.
Approved for publication on Iyun, 2026.

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CONTENTS

MECHANISMS FOR IMPLEMENTING TECHNOLOGICAL AND DIGITAL INNOVATIONS.....	10
Shakirxodjayeva Zuxra Rustamxanovna	
DEVELOPMENT OF ORGANIZATIONAL AND ECONOMIC MECHANISMS FOR IMPROVING INVESTMENT PROCESSES IN THE CONSTRUCTION INDUSTRY	16
Aliyeva Zilola Mamatvalyevna	
CURRENT STATE AND STRUCTURAL ANALYSIS OF THE DEVELOPMENT OF SERVICE SECTORS IN TASHKENT CITY.....	23
Abdikayumov Bekzod Turdiniyozovich	
GREEN BONDS VS. SUSTAINABILITY LINKED LOANS: WHICH WORKS FOR INDUSTRIAL DECARBONISATION?	29
Ataxanov Umidbek Olimovich	
ИНТЕГРИРОВАННАЯ МОДЕЛЬ УПРАВЛЕНИЯ ЭКОНОМИЧЕСКОЙ БЕЗОПАСНОСТЬЮ БАНКА	34
Маликова Дилрабо Муминовна	
ECONOMETRIC MODELLING OF FAMILY ENTREPRENEURSHIP DEVELOPMENT IN THE TOURISM SECTOR: EVIDENCE FROM UZBEKISTAN	42
Pardayeva Ozoda Mamayunusovna	
AN INTEGRAL INDEX METHODOLOGY FOR ASSESSING THE INVESTMENT POTENTIAL OF AGRICULTURAL ENTERPRISES	49
Sayyora Bakhtiyorovna Nazirova	
ГОСУДАРСТВЕННЫЕ, ПУБЛИЧНЫЕ И ОБЩЕСТВЕННЫЕ ФИНАНСЫ В УСЛОВИЯХ ЦИФРОВОЙ ТРАНСФОРМАЦИИ: ТЕРМИНОЛОГИЧЕСКИЕ ГРАНИЦЫ И ИНСТИТУЦИОНАЛЬНАЯ ЭВОЛЮЦИЯ.....	53
Срожиддинова Зарина Хайриддиновна	
BLOCKCHAIN-BASED FINANCIAL TRANSACTION MONITORING SYSTEM (SMART CONTRACTS, DECENTRALIZED DATABASE, AND AUDIT TRAILS)	58
Olimova Mukhlisa Vohidjon qizi	
FAMILY ENTREPRENEURSHIP AS A DRIVER OF EMPLOYMENT IN THE TOURISM SECTOR: REGIONAL DISPARITIES AND INSTITUTIONAL MECHANISMS IN UZBEKISTAN.....	65
Pardayeva Ozoda Mamayunusovna	
ANALYSIS OF THE MAIN STATISTICAL INDICATORS OF LABOR RESOURCE UTILIZATION IN SURXONDARYO REGION	72
Haydarova Dinora Atamurot qizi	
ASSESSING THE ROLE OF SPECIAL ECONOMIC ZONES IN REGIONAL ECONOMIC GROWTH ACROSS THE REGIONS OF UZBEKISTAN USING INTENSITY COEFFICIENTS AND CLUSTER ANALYSIS.....	77
Anvarkhonov Abdulatifkhon Jamshidkhon ugli	
TECHNICAL, ECONOMIC, AND ENVIRONMENTAL EFFICIENCY OF IMPLEMENTING AGRIVOLTAIC SYSTEMS IN UZBEKISTAN	85
Jabborov Shaymurod Akram o'g'li	
Botirov Bozorbek Musurmon o'g'li	
Atoyeva Mohinur Amrilloevna	
Avazov Jonibek Azizbek o'g'li	
МОДЕЛИРОВАНИЕ ВЛИЯНИЯ ЧЕЛОВЕЧЕСКОГО КАПИТАЛА НА ТРАЕКТОРИЮ ЭКОНОМИЧЕСКОГО РОСТА.....	91
Хазраткулова Лола Нармуминовна	
FINANCING GREEN PROJECTS IN THE REPUBLIC OF UZBEKISTAN: STATUS, CHALLENGES AND PROSPECTS	97
Qorriyeva Shahnoza Safarbayevna	

FORMULA-BASED DISTRIBUTION OF INTERGOVERNMENTAL TRANSFERS TO LOCAL BUDGETS IN UZBEKISTAN: A COMPARATIVE SIMULATION ANALYSIS BASED ON 2026 FORECAST INDICATORS.....	103
Umidjon Pardaev Sarvar Maxmudov	
GOVERNMENT FUNDING AND THE DEVELOPMENT OF INNOVATIVE ACTIVITIES: FINANCIAL PROMOTION MECHANISMS.....	115
Bahriddinov Nodirbek Zamirdinovich	
FORECASTING EXPORT AND IMPORT INDICATORS OF BUKHARA REGION	122
Ergashev Mirjon Yorqin o'g'li	
A CUSTOMER-ORIENTED INTEGRATIVE METHODOLOGICAL MODEL FOR IMPROVING THE EFFICIENCY OF TOURIST SERVICES IN THE TOURISM AND HOSPITALITY INDUSTRY	130
Bakayev Ziyovuddinkhan Toshbolta ogli	
A PESTLI ANALYSIS OF THE EFFICIENCY OF THE HOUSING STOCK MANAGEMENT SYSTEM	139
Mamanazarov Oybek Shomurodovich	
ANALYSIS OF THE DEVELOPMENT STATUS AND EXPORT ACTIVITIES OF SMALL BUSINESS AND PRIVATE ENTREPRENEURSHIP IN UZBEKISTAN	146
Khikmatullayeva Nargiza Jamoliddin kizi	
CHANGE MANAGEMENT DURING QUALITY ASSURANCE REFORM IN HIGHER EDUCATION INSTITUTIONS	154
Urinov Bobur Nasilloevich	
СТРАТЕГИИ УСТОЙЧИВОГО РАЗВИТИЯ ПАЛОМНИЧЕСКОГО ТУРИЗМА В УЗБЕКИСТАНЕ	162
Каримова Дилафруз Садриддин кизи	
E-COMMERCE AS A DIGITAL FORM OF ENTREPRENEURSHIP IN INCREASING HOUSEHOLD INCOMES	167
Eshbayeva Shahnoza Fakhriddinovna	
ADVANTAGES OF IMPLEMENTING AN OCCUPATIONAL AND SKILLS MAPPING SYSTEM IN UZBEKISTAN'S LABOUR MARKET	172
S.B.Goyipnazarov S.M.Kurbanbaeva	
ASSESSMENT OF THE EFFICIENCY OF FIXED ASSETS UTILIZATION IN RAILWAY ENTERPRISES: EVIDENCE FROM UZBEKISTAN.....	178
Turdiyeva Irodaxon Ismoil qizi	
SCIENTIFIC AND METHODOLOGICAL APPROACHES TO ASSESSING RESOURCE USE IN THE CONTEXT OF A GREEN ECONOMY.....	183
Karimov Islombek Bekpolat o'g'li	
THE IMPACT OF ECOTOURISM ON REGIONAL ECONOMIC DEVELOPMENT	
Samiev Siroj Saitovich Ochilova Guli Rashid kizi	
THE IMPACT OF RISK ALLOCATION ON INVESTMENT EFFICIENCY IN PUBLIC- PRIVATE PARTNERSHIP (PPP) PROJECTS	197
Khaydarova Charos Nizomiddinovna	
PROSPECTS FOR CHANGING THE VOLUME OF GRAPE CULTIVATION DUE TO THE USE OF INNOVATIVE TECHNOLOGIES IN THE VITICULTURE COMPLEX.....	202
Boltaev Nazarbek Narzullaevich	
ЦИФРОВЫЕ МЕХАНИЗМЫ ОБОСНОВАНИЯ НАЧАЛЬНОЙ ЦЕНЫ В ГОСУДАРСТВЕННЫХ ЗАКУПКАХ: ПРОЗРАЧНОСТЬ, КОНКУРЕНЦИЯ И РАЦИОНАЛЬНОЕ ИСПОЛЬЗОВАНИЕ СРЕДСТВ.....	209
Тўхтасинов Бобомурод Исақжон ўғли	
ENHANCING FOREIGN DIRECT INVESTMENT INFLOWS IN THE POST-CRISIS ERA:	

AN ECONOMETRIC ANALYSIS OF UZBEKISTAN	215
Foziljon Rustamov Xazratkulovich	
CURRENT STATE AND DEVELOPMENT TRENDS OF THE TEXTILE INDUSTRY	219
Musayeva Shoira Azimovna	
THE PECULIARITIES OF USING FOREIGN EXPERIENCE IN IMPROVING THE EFFICIENCY OF TOURIST AND RECREATIONAL AREAS	225
Makhliyo Umarova	
CHALLENGES OF ATTRACTING INVESTMENTS IN HUMAN CAPITAL AND STRATEGIES FOR THEIR RESOLUTION	231
Aloviddin Zayniddinov Zayniddin ugli	
ANALYSIS OF THE EXPERIENCE OF SUCCESSFUL AGROTOURISM DESTINATIONS IN DIFFERENT COUNTRIES: RECOMMENDATIONS FOR UZBEKISTAN	237
Aktamov Olimjon Abdugani o'g'li	
ASSESSING THE EFFICIENCY OF STRATEGIC MANAGEMENT OF EDUCATIONAL SERVICES EXPORT AT THE REGIONAL LEVEL	247
Alimova Shamsiya Abidovna	
ECONOMIC ESSENCE OF THE EXPORT POTENTIAL OF BUSINESS ENTITIES AND CLASSIFICATION OF THE FACTORS SHAPING IT: THE CASE OF BUKHARA REGION	254
Djurayeva Munira Sadillovna	
THE ROLE OF INDUSTRIAL ENTERPRISES IN THE ECONOMY OF BUKHARA REGION AND THEIR DEVELOPMENT TRENDS: AN ANALYSIS OF STRUCTURAL CHANGES AND REGIONAL CONCENTRATION	261
Azizjon Anvarovich Kadirov	
Nigina Djurayevna Yusupova	
IMPROVING THE ECONOMIC MECHANISMS FOR THE DEVELOPMENT OF BORDER TRANSPORT SYSTEMS	268
Ikromov Elyor Ibodulloevich	
ПУТИ ИНТЕГРАЦИИ НАЦИОНАЛЬНЫХ И МЕЖДУНАРОДНЫХ СТАНДАРТОВ АУДИТОРСКОЙ ДЕЯТЕЛЬНОСТИ В УЗБЕКИСТАНЕ	273
Бобонарова Камола	
GREEN BONDS AND SOVEREIGN DEBT INSTRUMENTS FOR INFRASTRUCTURE ASSET RENEWAL: AN ANALYSIS OF FINANCIAL MECHANISMS	278
Suleimanov Farrukh	
ENHANCING THE COMPETITIVENESS OF HIGHER EDUCATION INSTITUTIONS: A COMPARATIVE ANALYSIS OF INTERNATIONAL AND NATIONAL EXPERIENCES	286
Qudratova Gulzoda Mahmudovna	
THE ROLE AND SIGNIFICANCE OF INFORMATION AND COMMUNICATION SERVICES IN THE DIGITAL ECONOMY	291
Munisa Abdurakhmonova	
ECONOMETRIC MODELING OF REGIONAL ECONOMIC GROWTH BASED ON THE COBBDOUGLAS PRODUCTION FUNCTION: A CASE STUDY OF SURXONDARYA REGION	296
Turaev Bakhtiyor Ergashevich	
GENERAL APPROACHES TO COST REDUCTION IN THE TEXTILE INDUSTRY	302
Kamola Saidova	
СОВРЕМЕННОЕ СОСТОЯНИЕ ПЛАНИРОВАНИЯ И ОРГАНИЗАЦИИ ВНУТРЕННЕГО АУДИТА В БЮДЖЕТНЫХ ОРГАНИЗАЦИЯХ	307
Саитмуратов Саитмурат Машарип угли	
A CONCEPTUAL MODEL OF THE IMPACT OF INTERMEDIATION SERVICES ON BANK PERFORMANCE AND ITS STATISTICAL RESEARCH METHODOLOGY	314
Miraxmedov Jasur Isroilovich	
EMPLOYER BRANDING IN UZBEKISTAN: HOW TO BECOME AN EMPLOYER OF CHOICE FOR TALENT	320
Doniyorova Fotimabonu Alisher qizi	

FORMING THE COMMUNICATIVE CULTURE OF MANAGING PERSONNEL AND STUDENTS BASED ON A COMPETENCY-BASED APPROACH.....	325
Temirova Shakhlo Rakhmonovna	
MODERN APPROACHES TO FORMING A COMMUNICATIVE CULTURE OF STUDENTS OF HIGHER EDUCATION INSTITUTIONS.....	331
Temirova Shakhlo Rakhmonovna	
IMPROVEMENT OF THE SYSTEM OF ACCOUNTING AND ANALYSIS OF MATERIAL COSTS IN OIL AND GAS INDUSTRY ENTITIES BASED ON MODERN MANAGEMENT REQUIREMENTS.....	336
Sa'dullayeva Sayyora Nasillo qizi	
ORGANIZATIONAL AND ECONOMIC APPROACHES AND BARRIERS TO THE INNOVATIVE DEVELOPMENT OF THE REPUBLIC OF UZBEKISTAN	341
Samieva Gulnoza Tokhirovna	
THE IMPACT OF EFFECTIVE UTILIZATION OF LABOR POTENTIAL ON THE SUSTAINABLE ECONOMIC DEVELOPMENT OF A REGION (A case study of the Khorezm region).....	348
Kutlimuratov Mansurbek Sattarovich	
CHARACTERISTICS OF CLUSTERING TEXTILE ENTERPRISES.....	354
Asadbek Eshniyozov	
THE ROLE OF EDUCATION AND CAPACITYBUILDING IN DEVELOPING THE ISLAMIC FINANCE INDUSTRY: A THEORETICAL AND COMPARATIVE ANALYSIS	358
Abdullaev Azamat Akbar o'g'li	
THE ROLE OF 5G TECHNOLOGIES IN IMPROVING THE ECONOMIC PERFORMANCE OF TELECOMMUNICATION ENTERPRISES	366
Saidqosimova Umida Ibragimovna	
DIGITAL PLATFORMS AND THE EFFICIENCY OF INCLUSIVE EDUCATION: EVIDENCE FROM UZBEKISTAN	371
Kholmonov Shodiyor Karshiboyevich	
MAIN DIRECTIONS FOR THE DEVELOPMENT OF INTEREST RATE RISK MANAGEMENT PRACTICES IN COMMERCIAL BANKS OF UZBEKISTAN.....	377
Seitnazarov Daniyar Bakhadyrovich	
METHODOLOGY AND WAYS OF EFFECTIVE MANAGEMENT OF SMALL INDUSTRIAL ZONES.....	385
Shodmonkulov Kamoliddin Murodillayevich	
MAIN DIRECTIONS AND PROSPECTS FOR THE EFFECTIVE MANAGEMENT OF INVESTMENTS IN THE CONTEXT OF TRANSFORMATION	391
To'rayev Jasurali To'rayevich	
IMPROVING THE EFFECTIVE MANAGEMENT OF THE DEVELOPMENT OF SMALL INDUSTRIAL ZONES.....	395
Shodmonkulov Kamoliddin Murodillayevich	
ПОВЫШЕНИЕ ИНВЕСТИЦИОННОЙ АКТИВНОСТИ РЕГИОНОВ КАК ФАКТОР ОБЕСПЕЧЕНИИ УСТОЙЧИВОГО ЭКОНОМИЧЕСКОГО РОСТА.....	399
Бутаева Сабина Холиёровна	
THE ROLE OF DIGITAL MARKETING STRATEGIES IN INCREASING THE BRAND CAPITAL OF TOURISM ENTERPRISES	404
Zufarov Akmal Gulamiddinovich	
ANALYSIS OF THE CURRENT STATE OF INFRASTRUCTURE PROJECT FINANCING UNDER PUBLIC-PRIVATE PARTNERSHIPS (PPP)	416
Shodiev Akmal O'ktamjon ugli	
IMPROVING THE MANAGEMENT OF THE INVESTMENT ENVIRONMENT	422
To'rayev Jasurali To'rayevich	
BLOCKCHAIN AND IOT FOR DIGITAL TRACKING OF FOOD EXPORTIMPORT FLOWS.....	426
Nazarova Ra'no Rustamovna	
Najmiddinov Yakhyo Fazliddin ugli	

THE PAYBACK PERIOD METHOD IN PERSONAL FINANCE: APPLICATIONS AND IMPLICATIONS FOR FINANCIAL DECISION-MAKING	438
Akhunova Elena Anvarovna	
DEVELOPMENT OF AN ADAPTIVE FIBONACCI STRUCTURAL ANALYSIS MODEL FOR GOLD TRADING: EVIDENCE FROM THE XAU/USD MARKET	447
Tukmirzaev Kamol Mumin ugli	
DEVELOPING MARKETING MANAGEMENT IN RETAIL TRADE THROUGH A BRAND MANAGEMENT SYSTEM: DIRECTIONS AND STRATEGIC PRIORITIES.....	455
Shohboz Ro'zimatov Hamdambek o'g'li	
MODERN APPROACHES TO FORMING A COMMUNICATIVE CULTURE OF STUDENTS OF HIGHER EDUCATION INSTITUTIONS	461
Temirova Shakhlo Rakhmonovna	
FORMING THE COMMUNICATIVE CULTURE OF MANAGING PERSONNEL AND STUDENTS ON THE BASIS OF A COMPETENCY-BASED APPROACH.....	466
Temirova Shakhlo Rakhmonovna	
ЭВОЛЮЦИЯ НАУЧНЫХ ВЗГЛЯДОВ НА РОЛЬ СФЕРЫ УСЛУГ В ЭКОНОМИКЕ.....	472
Усманов Фарзод Шохрухович	
STRATEGIC INSIGHTS FOR UZBEKISTAN'S RURAL DIGITALIZATION: LESSONS FROM THE SPATIAL SPILLOVER EFFECTS OF CHINA'S DIGITAL ECONOMY	481
Zhang Zhe	
ЦИФРОВЫЕ МЕХАНИЗМЫ ОБОСНОВАНИЯ НАЧАЛЬНОЙ ЦЕНЫ В ГОСУДАРСТВЕННЫХ ЗАКУПКАХ: ПРОЗРАЧНОСТЬ, КОНКУРЕНЦИЯ И РАЦИОНАЛЬНОЕ ИСПОЛЬЗОВАНИЕ СРЕДСТВ	487
Тўхтасинов Бобомурод Исақжон ўғли	
IMPROVING ORGANIZATIONAL AND ECONOMIC MECHANISMS FOR ENHANCING SERVICE INFRASTRUCTURE EFFICIENCY: EVIDENCE FROM KASHKADARYA REGION	493
Azimov Islom	
ASSESSING DIGITAL GOVERNANCE EFFECTIVENESS IN HIGHER EDUCATION INSTITUTIONS: EVIDENCE FROM UZBEKISTAN	498
Berdiyev Temurbek Makhmudullo ugli	
РАЗРАБОТКА ИНТЕГРАЛЬНОГО ИНДЕКСА КОРПОРАТИВНОГО УПРАВЛЕНИЯ (CGI) ДЛЯ БАНКОВ С ГОСУДАРСТВЕННЫМ УЧАСТИЕМ.....	506
Жумадуллаева Дурдона Шухрат кизи	
DIGITAL ECONOMY-BASED GOVERNANCE IN HIGHER EDUCATION: LEVERAGING AI AND DATA FOR IMPROVED INSTITUTIONAL PERFORMANCE	512
Olimjonov Abbosjon Olimjonovich	
THE IMPACT OF E-COMMERCE DEVELOPMENT ON NATIONAL ECONOMIC COMPETITIVENESS.....	517
Baymuradov Shokhrukh Makhmudovich	
FACTORS INFLUENCING TAX REVENUE EFFICIENCY IN UZBEKISTAN IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT	522
Jurayev Xusan Atamuratovich	
THE ESSENCE, TASKS, AND INTERNATIONAL APPROACHES OF INTERNAL AUDIT IN LEASING TRANSACTIONS.....	536
Sadritdinov Bakhodir Bakhtiyarovich	
DIGITAL TRANSFORMATION OF MANAGEMENT ACCOUNTING IN THE MINING SECTOR.....	543
Oybekova S.K.	
METHODOLOGY FOR REFLECTING GOODWILL, INTANGIBLE ASSETS, AND INVESTMENTS IN CONSOLIDATION.....	548
Maxmudova Nargiza Davlyat qizi	
FACTORS AFFECTING DAIRY PRODUCTION EFFICIENCY:	

CORRELATION AND REGRESSION ANALYSIS.....	554
Ergashev M.Y.	
Tairova Z.M.	
THE DMED INFORMATION SYSTEM AS A FOUNDATION FOR THE DEVELOPMENT OF THE NATIONAL E-HEALTH SYSTEM	561
Omonov Olim Murodullayevich	
THEORETICAL AND ECONOMIC FOUNDATIONS FOR ENHANCING THE COMPETITIVENESS OF AGRICULTURAL PRODUCTS IN GLOBAL MARKETS	566
Safarova Muxabbat Radjabovna	
THEORETICAL AND ECONOMIC FOUNDATIONS OF INNOVATIVE TECHNOLOGIES IN THE SUPPLY SYSTEM OF NURSERY FARMS	573
Abdufarmonov Farrux Faxriddinovich	
APPLICATION OF DIGITAL TECHNOLOGIES IN THE TOURISM MARKET AND ASSESSMENT OF THE EFFICIENCY OF THE PLATFORM ECONOMY.....	580
Jumayev Bobomurod Nurmaxmat o'g'li	
ОСОБЕННОСТИ «ЖЕНСКОГО» ЧЕЛОВЕЧЕСКОГО КАПИТАЛА В ЭКОНОМИЧЕСКОЙ СИСТЕМЕ.....	586
Холбаева Сабина Рустамовна	
ВНЕДРЕНИЕ ПРИОРИТЕТНЫХ НАПРАВЛЕНИЙ ПОДДЕРЖКИ ИННОВАЦИОННОЙ ДЕЯТЕЛЬНОСТИ С УЧЁТОМ ЗАРУБЕЖНОГО ОПЫТА В МАЛОМ И СРЕДНЕМ БИЗНЕСЕ УЗБЕКИСТАНА.....	595
Камбарова Шахнозахон Мирвахитовна	
ISSUES OF EFFECTIVELY UTILIZING REGIONAL EXPORT POTENTIAL IN UZBEKISTAN	603
Umaraliyev Sarvar Rustamovich	
TERRITORIAL DISPROPORTIONS IN TOURISM INFRASTRUCTURE OF THE JIZZAKH REGION AND THEIR IMPACT ON TOURIST FLOWS.....	610
A.Sh. Daliev	
T.Sh. Muxiddinov	
METHODOLOGICAL APPROACHES TO HOUSING CONSTRUCTION DEVELOPMENT IN UZBEKISTAN: INVESTMENT EFFICIENCY AND PUBLIC-PRIVATE PARTNERSHIP MECHANISMS.....	616
Mirumar Abdulla Ugli Usmonov	
IMPROVEMENT OF COST ACCOUNTING AND ECONOMIC ANALYSIS IN THE FISHERY INDUSTRY: PRIORITY DIRECTIONS FOR THE ADAPTATION OF IFRS, ECONOMETRIC MODELING, AND ESG REPORTING FOR FISHERY CLUSTERS IN UZBEKISTAN.....	620
Shodiev Aslam Rakhmatilloevich	
Alikulov Abdumumin Ismatovich	
WAYS TO DEVELOP FRUIT PROCESSING ENTERPRISES BASED ON THE CLUSTER SYSTEM	627
Yusufova Laylo G'ayrat qizi	
ARTIFICIAL INTELLIGENCE IN MODERN BANKING SERVICE DEVELOPMENT	635
Mamutova Aygul Kalmurzaevna	
IMPLEMENTATION OF COMPUTER-ASSISTED AUDIT TECHNIQUES (CAATS) AND ANALYTICAL PROCEDURES IN THE AUDIT OF COMMERCIAL BANKS' FINANCIAL STATEMENTS.....	642
Ibragimov Nodirbek Baxodir ugli	
CRITERIA FOR ASSESSING THE QUALITY OF THE AUDIT OF COMMERCIAL BANKS' FINANCIAL STATEMENTS AND THE FORMATION OF KEY AUDIT MATTERS (ISA 701)	649
Ibragimov Nodirbek Baxodir ugli	
THE ROLE OF EDUCATION AND CAPACITYBUILDING IN DEVELOPING THE ISLAMIC FINANCE INDUSTRY: A THEORETICAL AND COMPARATIVE ANALYSIS	656
Abdullayev Azamat Akbar o'g'li	

FOREIGN EXPERIENCE IN SERICULTURE DEVELOPMENT: ORGANIZATIONAL AND ECONOMIC MECHANISMS APPLICABLE TO UZBEKISTAN.....	664
Janikulova Lobar Shakarbaevna	
SUSTAINABLE COMPETITIVE ADVANTAGE THROUGH ESG AND ENERGY MANAGEMENT: A GREEN MARKETING PERSPECTIVE	670
Khaydarova Kamola Axinjanovna	
SYSTEM AND STRATEGY FOR HUMAN CAPITAL DEVELOPMENT IN AN ORGANIZATION	675
Azimov Tolmas Nematullayevich	
MECHANISMS FOR ENHANCING THE EXPORT POTENTIAL OF SMALL BUSINESSES: EVIDENCE FROM UZBEKISTAN	682
Abdusalim Shavkatov	
STRUCTURE AND DYNAMICS OF BANK LOANS	689
Jorayeva Zarifa	
THE IMPORTANCE OF USING MODERN APPROACHES IN THE MANAGEMENT OF BUSINESS PROCESSES OF TEXTILE ENTERPRISES.....	698
Djumaniyazova Mo‘tabarkhan Ravshanbekovna	
IMPROVING THE METHOD OF ASSESSING MARKETING ACTIVITY EFFICIENCY IN SEWING AND KNITTING ENTERPRISES	704
Muminov Dilmurod Tokhtasinovich	
MODERN INDICATORS FOR EVALUATING THE EFFECTIVENESS OF INTERNATIONAL GRANTS AND TARGETED PROGRAMS IN HIGHER EDUCATION INSTITUTIONS	713
Ulugbek Qudrat ugli Almardanov	
STAGES OF INDUSTRIAL ENTERPRISES' TRANSITION TO A GREEN ECONOMY UNDER MANAGEMENT TRANSFORMATION.....	717
Matluba Nematovna Abdullayeva	
Kamoliddin Fakhriddin ugli Nuriddinov	
THE ROLE OF INFLATION TARGETING AND INTEREST RATE POLICY IN MANAGING CAPITAL FLOWS: EVIDENCE FROM UZBEKISTAN AND EMERGING ECONOMIES.....	722
Mamadjanov Farrux	
IMPROVING THE USE OF DIGITAL TECHNOLOGIES IN CORPORATE ENTERPRISE MANAGEMENT.....	731
Kuchkarov Ulugbek Taxirovich	
ISSUES OF FORMING AND EFFECTIVELY UTILIZING INVESTMENT RESOURCES IN FUEL AND ENERGY ENTERPRISES.....	735
Shukurillaev Jahongir Botir o'g'li	
IMPROVING THE APPLICATION OF BIG DATA TECHNOLOGIES IN THE DIGITALIZATION OF COMMERCIAL BANKS.....	741
Turabova Shahnoza Taxirovna	
EVALUATING THE EFFECTIVENESS OF PROJECTS IMPLEMENTED BY CIVIL SOCIETY INSTITUTIONS USING PUBLIC FUNDS	746
Xusanova Gulsum Baxtiyorovna	
UNCONVENTIONAL MONETARY POLICY AND INFLATION TARGETING IN EMERGING ECONOMIES: LESSONS FOR UZBEKISTAN.....	755
Saidov Sardorbek	
IMPROVING SCIENTIFIC CONSULTING SERVICE PROCESSES IN HIGHER EDUCATION INSTITUTIONS THROUGH AN INTEGRATED DIGITAL PLATFORM.....	763
Nafisa Erkinovna Norboyeva	

ПОВЫШЕНИЕ ЭФФЕКТИВНОСТИ ИСПОЛЬЗОВАНИЯ АКТИВОВ НЕФТЕГАЗОВОЙ КОМПАНИИ НА ОСНОВЕ РАЗВИТИЯ АУТСОРСИНГОВЫХ УСЛУГ (НА ПРИМЕРЕ АО «УЗБЕКНЕФТЕГАЗ»)	770
Шодмонов Шокир Дустмуродович	
IMPROVING THE RECOGNITION AND MEASUREMENT OF EMPLOYEE COMPENSATION EXPENSES IN ACCORDANCE WITH INTERNATIONAL FINANCIAL REPORTING STANDARDS	780
Rakhimov Anvar Makhmarasulovich	
METHODS FOR INCREASING ECONOMIC EFFICIENCY IN ENTERPRISES IN THE CONSTRUCTION INDUSTRY	785
Asadova Maftuna Sa'dullayevna	

METHODS FOR INCREASING ECONOMIC EFFICIENCY IN ENTERPRISES IN THE CONSTRUCTION INDUSTRY



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Abstract. This study conducts an economic analysis of the composition, characteristics, and key factors affecting economic efficiency indicators in construction industry enterprises. The research examines the level of resource utilization in production activities, labor productivity, production costs, the efficiency of fixed asset use, and the mechanisms shaping financial outcomes in construction enterprises.

In addition, the study analyzes internal and external factors affecting economic efficiency in the construction industry, including the level of development of production technologies, investment volume, raw material supply, the quality of labor resources, management efficiency, and changes in market conditions. The research results provide scientifically grounded conclusions and practical recommendations aimed at enhancing economic efficiency in enterprises, ensuring the rational use of available resources, and optimizing production costs.

Keywords: economic efficiency; productivity; production costs; labor productivity; profitability; economic analysis.

Аннотация. В данной статье проводится экономический анализ структуры, особенностей и основных факторов, влияющих на показатели экономической эффективности предприятий строительной отрасли. Исследуются уровень использования ресурсов в производственной деятельности, производительность труда, производственные затраты, эффективность использования основных средств, а также механизмы формирования финансовых результатов строительных предприятий.

Кроме того, проанализированы внутренние и внешние факторы, оказывающие влияние на экономическую эффективность предприятий строительной отрасли, включая уровень развития производственных технологий, объем инвестиций, обеспеченность сырьевыми ресурсами, качество трудовых ресурсов, эффективность системы управления и изменения рыночной конъюнктуры. По результатам исследования сформулированы научно обоснованные выводы и практические рекомендации, направленные на повышение экономической эффективности предприятий, обеспечение рационального использования имеющихся ресурсов и оптимизацию производственных затрат.

Ключевые слова: экономическая эффективность; производительность; производственные затраты; производительность труда; рентабельность; экономический анализ.

INTRODUCTION

The construction industry is recognized as one of the strategic sectors driving the economic growth of nations. This sector is of significant importance due to its role in infrastructure development, the creation of new employment opportunities, the enhancement of investment activity, and the integrated advancement of industrial and service sectors. According to international economic research, the global construction market exceeded USD 13.9 trillion in 2025, with forecasts indicating an increase to USD 17.5 trillion by 2030. The construction sector accounts for approximately 13 percent of global gross domestic product and provides between 7 and 8 percent of global employment. In this respect, the construction industry serves as a “multiplicative driver” of economic growth¹².

In the Republic of Uzbekistan, the construction sector is recognized as one of the fastest-growing industries within the national economy. According to data from the National Statistics Committee of the Republic of Uzbekistan, the volume of construction works completed in the country in 2025 amounted to 313.9 trillion soums, reflecting a 14.0 percent increase compared to 2024. Over the past five years, the construction sector’s share of gross domestic product has consistently ranged between 6.5 and 7.0 percent, while the number of active enterprises in the sector has exceeded 45,000.

At the same time, the acceleration of urbanization processes, the establishment of the “New Tashkent” and “New Uzbekistan” districts, the development of transport and logistics infrastructure, industrial zones, and energy facilities, as well as the scientifically grounded management of allocated funds, highlight the growing importance of effective resource governance. These indicators confirm the steady growth in the role and importance of the construction sector within the national economy. Therefore, issues related to the efficient utilization of resources, scientifically grounded cost control, and the optimization of production processes in this sector are of particular significance³.

LITERATURE REVIEW

The issues of enhancing economic efficiency in construction industry enterprises have been examined from various perspectives by both foreign and local economists.

Economic efficiency in the construction sector has been studied by numerous researchers. In particular, F. W. Taylor⁴, H. Ford⁵, T. Ohno⁶, W. E. Deming⁷, P. Drucker⁸, and M. Porter⁹ explained efficiency in terms of labor productivity, cost reduction, rational resource utilization, and the maintenance of competitive advantage. The specific features of the construction sector have also been studied in the context of BIM and digital technologies by researchers such as C. Eastman¹⁰, P. Teicholz, R. Sacks, K. Liston, S. Azhar¹¹, D. Bryde, and W. Lu. Their works provide both theoretical and practical foundations for the efficient use of time, costs, and resources in construction processes.

In addition, among scholars from the CIS countries and Uzbekistan, the works of V. B. Ivashkevich¹², M. A. Vakhrushina¹³, V. E. Kerimov, M. Q. Pardayev¹⁴, B. I. Isroilov, N. Sh. Jo’rayev, and A. K. Karimov serve as important academic sources for studying cost management, managerial accounting, and the improvement of economic efficiency in construction enterprises¹⁵.

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RESEARCH METHODOLOGY

The introduction of digital control technologies in the construction industry is advancing labor cost accounting systems to a new stage. In particular, ERP (Enterprise Resource Planning) systems, BIM (Building Information Modeling) technologies, Primavera, AutoCAD BIM, and “1C: Construction” platforms facilitate the automation of construction processes and the efficient management of labor resources¹⁶.

ERP systems enable construction enterprises to manage workforce, financial resources, and material flows within a unified information database. This improves the efficiency of labor cost analysis and supports timely managerial decision-making. BIM technologies make it possible to accurately forecast labor requirements and optimize resource allocation by creating digital models of construction projects¹⁷ (Table 1).

Table 1

Comparative analysis of digital platforms used for labor cost calculation in the construction industry¹⁸

System	Advantages	Disadvantages	Efficiency
ERP	Unified management of all resources within a single system	High implementation cost	High
BIM	Precise modeling and forecasting	Expert training required	High
Primavera	Effective for project planning	Costly for small businesses	Medium
1C: Construction	Integration of accounting and workforce records	Functionally limited	Medium
AutoCAD BIM	Visual analysis capability	Requires big data	High
“Transparent Construction”	Government monitoring and transparency	Does not cover all processes	Medium

The reforms underway in Uzbekistan to digitize the construction sector also contribute to the development of digital systems for calculating labor costs.

ANALYSIS AND RESULTS

As part of the research, an author-developed digital mechanism for calculating labor costs in construction work was proposed. The main purpose of this mechanism is to improve the efficiency of labor resource utilization, reduce working time losses, and monitor labor costs in real time.

The proposed mechanism includes the following elements:

- automated labor monitoring;
- work time tracking via QR codes;
- monitoring of employee activity using IoT sensors;
- a real-time analytical monitoring platform.

According to the operating procedure of the mechanism, an individual QR code is assigned to each worker, and the process of entering and exiting the construction site is recorded electronically. These data are transmitted to a central database, and labor consumption, working hours, and efficiency indicators are automatically calculated through the analytical module. As a result, rapid reports on labor costs are generated, thereby accelerating the process of managerial decision-making (Figure 1).

¹⁶ Eastman C. et al. *BIM Handbook: A Guide to Building Information Modeling*. – New Jersey: Wiley, 2018.

¹⁷ Project Management Institute. *Practice Standard for Project Estimating*. – PMI, 2021.

¹⁸ Decree of the President of the Republic of Uzbekistan No. PF-5963 dated March 2, 2020, on Measures for Comprehensive Reform of the Construction Sector

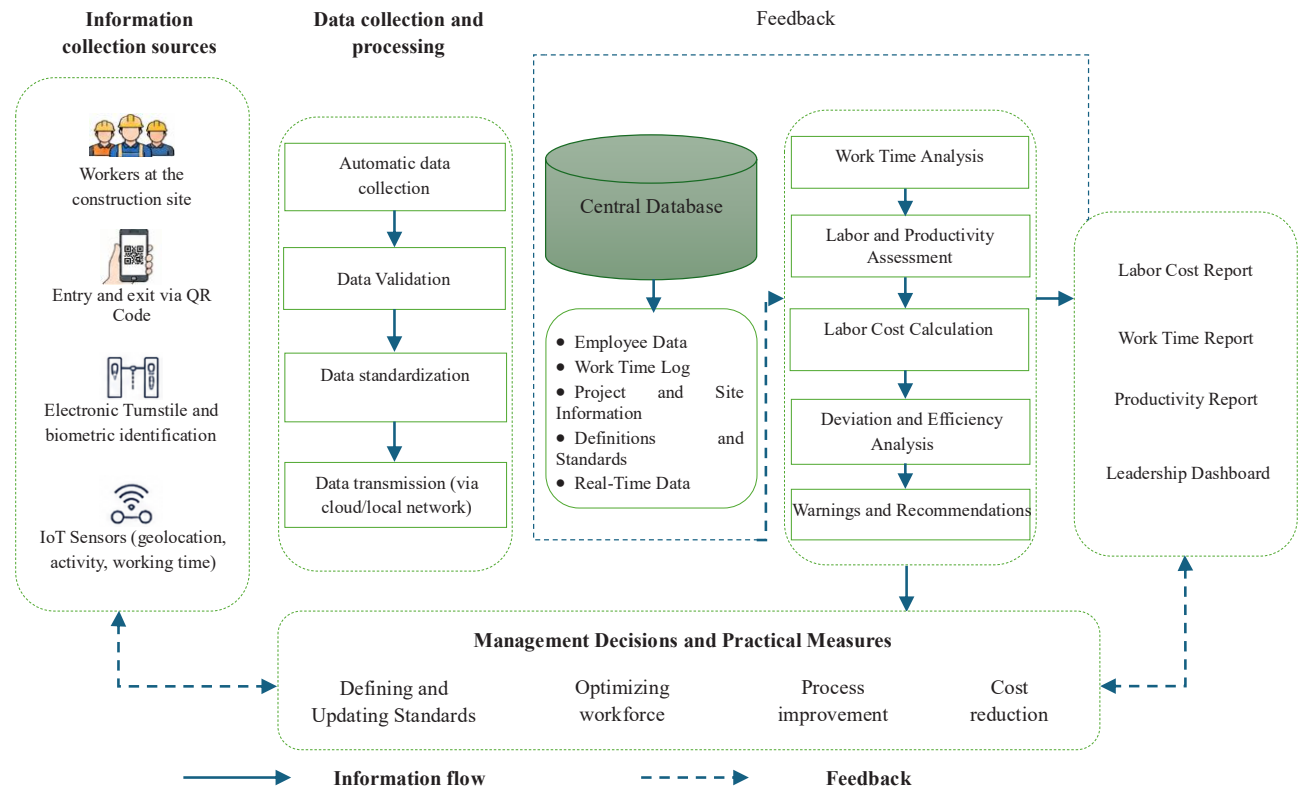


Figure 1. Digital management mechanism for labor costs in construction works¹⁹

Implementing the proposed digital mechanism enhances the accuracy of labor cost calculations, reduces hidden expenses, and improves the effective use of working time. The research results show that construction companies implementing digital monitoring systems have achieved an average increase in labor productivity of 12–15%. This is of significant importance for improving the economic efficiency of construction projects and ensuring financial stability.

CONCLUSION AND RECOMMENDATIONS

The research findings indicate that improving economic efficiency in construction industry enterprises is fundamentally linked to increasing labor productivity, efficiently allocating production costs, and refining the management system through modern approaches. Moreover, the analysis confirmed that the factors influencing efficiency in the construction industry are multifaceted and are determined not only by the internal operations of enterprises but also by technological advancements, market demand, and external economic conditions.

Therefore, the use of digital management tools in the sector, particularly ERP, BIM, Primavera, AutoCAD BIM, and information platforms, is of practical importance for accounting for and controlling labor costs. In particular, the proposed digital mechanism, which integrates QR code control, IoT sensors, automated monitoring, and real-time analytical management elements, enables the precise calculation of labor consumption, reduces working time losses, and minimizes hidden costs in construction companies.

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Proofreader: Xondamir Ismoilov
Layout and Designer: Hasan Maqsudov

2026. № 6

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