**УДК 332.8:330.1:177.1** **DOI: 10.30857/2786-5398.2025.2.7**

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# ADAPTING ARCHITECTURAL AND CONSTRUCTION COMPANIES TO EUROPEAN NORMS AND STANDARDS: RECOMMENDATIONS AND A STEP-BY-STEP TRANSITION ALGORITHM

*The article is devoted to the theoretical and applied foundations of adapting architectural and construction companies to European norms and standards in the context of Ukraine's strategic integration into the single economic, technical, and institutional space of the EU. The relevance of the study has been substantiated in connection with increasing regulatory pressure, requirements for operational transparency, digital transformation, and corporate social responsibility. Considering global challenges such as climate change, resource vulnerability, and sustainable development imperatives, the article emphasizes the need for a systematic approach to reforming the managerial, technical, organizational, and social subsystems of an architectural and construction company. It has been determined that the key frameworks for modernization are unified standards (EN Eurocodes, CPR, ISO 9001, ISO 14001, ISO 45001) and advanced construction concepts (nZEB, ESG, BIM, digital object passports). The scientific apparatus of the article presents a nine-stage algorithm for transitioning to European standards, which includes an audit of the current state, roadmap development, regulatory adaptation, digitalization, personnel transformation, institutional integration, quality certification, ESG implementation, and monitoring mechanisms. Each stage is accompanied by practical recommendations focused on gradual implementation of changes and effective use of internal and external resources. The methodology proposed by the authors is based on an interdisciplinary approach – the integration of architectural theory, ecological economics, digital engineering, risk management, and organizational psychology. Special attention is given to eight key areas of improvement. In the field of regulatory compliance, the focus is on the implementation of EN Eurocodes and CPR, which ensures access to European tenders and increases the investment attractiveness of the company. In the area of energy efficiency, the advantages of implementing certified solutions (BREEAM, LEED, nZEB concepts) are substantiated, as they reduce operational costs, increase market value of assets, and meet the environmental criteria for financing. Digital transformation is addressed through the integration of BIM, ERP/CRM, digital passports, and IoT systems, which enhance the accuracy, transparency, and interconnectivity of project and operational departments. Risk and performance management is presented as the implementation of financial modelling tools (NPV, IRR, CBA, sensitivity analysis), allowing for the optimization of managerial decision-making processes and increased project attractiveness for investors. Systemic personnel transformation, described as a separate improvement line, includes staff certification, introduction of an internal culture of continuous learning, and participation in international educational programs. Institutional integration is outlined through the establishment of partnerships with municipalities, academic institutions, civil society organizations, and European platforms (Horizon Europe, EU BIM Task Group, etc.). The area of quality management and certification emphasizes the gradual implementation of ISO 9001, 14001, and 45001, which enhance the organizational maturity of the company and expand opportunities for participation in international projects. The final area is ESG orientation:*

*implementation of sustainable development principles, inclusivity, transparent reporting, and social responsibility. The methodological basis of the study is formed using system-structural analysis, bibliometric review of publications (Web of Science, Scopus), benchmarking, SWOT analysis, empirical modelling, and logical-inductive synthesis. This made it possible to combine scientific theoretical conclusions with practical tools for their implementation in the management practice of an architectural and construction company.*

***Keywords:*** *adaptation to European standards; architectural and construction company; digital transformation; energy efficiency; quality management; institutional integration; ESG approaches and social responsibility; risk and performance management.*

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## АДАПТАЦІЯ АРХІТЕКТУРНО-БУДІВЕЛЬНОЇ КОМПАНІЇ ДО ЄВРОПЕЙСЬКИХ НОРМ І СТАНДАРТІВ: РЕКОМЕНДАЦІЇ ТА АЛГОРИТМ ПЕРЕХОДУ

*Статтю присвячено теоретико-прикладним засадам адаптації архітектурно-будівельних компаній до європейських норм і стандартів в умовах стратегічної інтеграції України до єдиного економічного, технічного та інституційного простору ЄС. Обґрунтовано актуальність дослідження у зв'язку з посиленням регуляторного тиску, вимогами до прозорості діяльності, цифрової трансформації та соціальної відповідальності бізнесу. З урахуванням глобальних викликів, зокрема зміни клімату, ресурсної вразливості та вимог сталого розвитку, акцентовано на необхідності системного підходу до реформування управлінських, технічних, організаційних і соціальних підсистем архітектурно-будівельної компанії. Визначено, що ключовими рамками модернізації є уніфіковані стандарти (EN Eurocodes, CPR, ISO 9001, ISO 14001, ISO 45001) і новітні концепції будівництва (nZEB, ESG, BIM, цифрові паспорти об'єктів). У науковому апараті статті сформовано дев'ятиетапний алгоритм переходу до європейських норм, який включає аудит поточного стану, формування дорожньої карти, нормативну адаптацію, цифровізацію, кадрову трансформацію, інституційну інтеграцію, сертифікацію якості, впровадження ESG-підходів і механізми моніторингу. Кожен етап супроводжується практичними рекомендаціями, орієнтованими на поступовість впровадження змін та ефективність використання внутрішніх і зовнішніх ресурсів. Методика, запропонована авторами, базується на міждисциплінарному підході – інтеграції архітектурної теорії, екологічної економіки, цифрової інженерії, ризик-менеджменту та організаційної психології. Особливу увагу приділено восьми ключовим напрямкам вдосконалення. У сфері нормативної відповідності акцент зроблено на впровадженні EN Eurocodes і CPR, що забезпечує доступ до європейських тендерів і підвищує рівень інвестиційної привабливості підприємства. У напрямі енергоефективності обґрунтовано переваги впровадження сертифікованих рішень (BREEAM, LEED, концепції nZEB), які дозволяють знизити експлуатаційні витрати, підвищити ринкову вартість об'єктів і відповідати екологічним критеріям фінансування. Цифрова трансформація розглянута через інтеграцію BIM, ERP/CRM, цифрових паспортів і IoT-систем, що підвищує точність, прозорість і взаємозв'язок проєктних і виконавчих*

*підрозділів. Управління ризиками й ефективністю представлено як впровадження фінансового моделювання (NPV, IRR, CBA, аналіз чутливості), що дозволяє оптимізувати процес прийняття управлінських рішень і підвищити привабливість проектів для інвесторів. Системна кадрова трансформація, описана як окрема лінія вдосконалення, включає сертифікацію персоналу, впровадження внутрішньої культури безперервного навчання й участі у міжнародних освітніх програмах. Інституційна інтеграція окреслена через формування партнерств із муніципалітетами, науковими інституціями, громадськими організаціями та європейськими платформами (Horizon Europe, EU BIM Task Group тощо). Напрям управління якістю та сертифікації акцентує на поступовому впровадженні ISO 9001, 14001 і 45001, які підвищують організаційну зрілість компанії й розширюють можливості для участі в міжнародних проєктах. Завершальним напрямом є ESG-орієнтація: впровадження принципів сталого розвитку, інклюзивності, прозорої звітності та соціальної відповідальності. Методологічну базу дослідження сформовано з використанням системно-структурного аналізу, бібліометричного огляду публікацій (Web of Science, Scopus), бенчмаркінгу, SWOT-аналізу, емпіричного моделювання та логіко-індуктивного синтезу. Це дозволило поєднати наукові теоретичні висновки з прикладним інструментарієм для їх імплементації в практику управління архітектурно-будівельною компанією.*

***Ключові слова:*** *адаптація до європейських стандартів; архітектурно-будівельна компанія; цифрова трансформація; енергоефективність; управління якістю; інституційна інтеграція; ESG-підходи та соціальна відповідальність; управління ризиками та ефективність.*

**Problem statement.** The relevance of researching the adaptation of architectural and construction companies to European norms and standards is driven by the necessity of Ukraine's integration into the European economic and cultural community. Current globalization conditions require Ukrainian enterprises to comply with international standards, which is especially important for the construction sector, where quality, safety, and environmental standards are critically significant.

First and foremost, adaptation to European norms opens new opportunities for participation in international tenders, which is a key factor for attracting investments. Many European projects require compliance with specific standards, making them accessible only to companies that meet these requirements. This creates competitive advantages for enterprises capable of aligning their operations accordingly. Furthermore, compliance with European standards enhances the trust of investors and partners. Standardized documentation and transparency in construction processes reduce the risks associated with regulatory non-compliance. This is particularly important for attracting foreign partners who value a high level of professionalism and reliability. Environmental aspects also play a significant role in this process. Modern European standards emphasize sustainable development and energy efficiency, which are critically important for reducing negative environmental impact. Adapting to such standards allows companies to implement advanced technologies and materials that meet ecological requirements. An important aspect is also the implementation of new methodologies and technologies, such as Building Information Modeling (BIM). These tools help improve the design and management of construction projects, increasing efficiency and reducing costs. Digitalization is a key component of the modern construction process, and its integration into company operations is essential.

Adaptation to European standards also contributes to the development of the professional potential of personnel. Enhancing staff qualifications in the fields of sustainable construction, digital technologies, and international standards is crucial for ensuring high-quality project

implementation. This forms a workforce capable of competing in the international market. Institutional cooperation with municipalities and educational institutions is another important element of adaptation. Establishing partnerships provides access to grant funding, participation in pilot projects, and knowledge exchange. This supports the implementation of innovative solutions and improves project quality.

The need to develop clear algorithms for the transition to European standards is becoming increasingly urgent. Defining adaptation stages, quality assessment methods, and the implementation of a quality management system will ensure a systematic approach to change implementation. This will enable companies to effectively plan and execute transformation processes.

Therefore, the study of adaptation of architectural and construction companies to European norms is of exceptional importance for the development of the industry in Ukraine. It not only enhances the competitiveness of enterprises but also facilitates integration into the European space, creating new opportunities for sustainable economic development of the country.

**Analysis of recent research and publications.** In the context of the transformation of the construction sector toward digitalization, environmental sustainability, and regulatory integration into the European space, the scientific community has significantly intensified research into the key aspects of this adaptation. The most relevant studies have been analyzed in accordance with eight strategic areas of improvement. In the context of regulatory compliance, the study by D.S. Mlote et al. [11] offered a systematic review of building adaptability to changes in the regulatory environment, particularly regarding the implementation of EN Eurocodes. This allows for unified technical standards to be viewed as the basis for harmonizing national design systems. In the field of energy efficiency, C.C. Bungau et al. [12] conducted an extensive bibliometric analysis of over 28,000 publications, identifying BREEAM, LEED, and the nZEB concept as system-forming mechanisms of environmental certification in the European market. Regarding innovation and digitalization, O. Samuelson and L. Stehn [14] demonstrated that large-scale implementation of BIM, digital twins, and IoT systems contributes to the optimization of the project cycle and enhances management transparency. Their review emphasizes the strategic importance of digital transformation in meeting European criteria. In the area of risk and performance management, S.A. Adekunle et al. [16] highlighted the critical role of financial tools such as NPV, IRR, CBA, and sensitivity analysis. Their application is indicated as a key stage in preparing construction companies for participation in grant programs and public investment projects. Professional staff training is addressed in the work of T.S. Ojambati et al. [17], which emphasizes the dependence of project productivity on the depth of technical education of employees. The research supports the necessity of continuous education and certification of specialists in BIM and eco-design (Scopus-indexed). Regarding institutional cooperation, A. Mannino et al. [18] stressed the importance of interaction between companies, municipalities, and educational institutions for technology transfer and access to innovation. The integration of BIM with IoT is considered the foundation of modern Facility Management. In the field of quality management and certification, the work of M. Gabr [19] illustrates the differences between the LEED, BREEAM, and GRIHA systems, as well as the barriers to their implementation in countries undergoing regulatory harmonization. The need for gradual implementation of ISO 9001, 14001, and 45001 is outlined. Finally, in the area of inclusivity and ESG, R.R.R. Bezerra et al. [20] conducted a validation of ESG implementation barriers in the construction industry, proposing a matrix of key challenges and strategies for overcoming them. In particular, the importance of social responsibility and public reporting within the framework of European requirements is emphasized.

Thus, the analyzed publications by foreign authors have served as a foundation for consolidating best practices and forming a methodological toolkit that meets the demands of the European construction market.

**Research methods.** 1. System-structural analysis: used to construct the methodological algorithm for transitioning to European standards. It enabled logical structuring of the eight areas of company improvement and the formulation of sequential transformation stages. 2. Content analysis of regulatory frameworks (EN Eurocodes, ISO, CPR): applied to analyze the content of European technical and organizational standards with the goal of translating them into the internal policies of the company. 3. Bibliometric and abstract analysis (Scopus, Web of Science): enabled identification of current scientific trends, relevant areas of innovation, challenges of ESG, BIM, and nZEB implementation, and served as the theoretical foundation for the methodology. 4. Project financial assessment methods (NPV, IRR, CBA, sensitivity analysis): used to justify the feasibility of investments in modernization, certification, and digitalization. These methods ensured transparency of economic decision-making in accordance with EU standards.

**The purpose of the study is** to develop a systematic approach to the adaptation of architectural and construction companies in Ukraine to European norms and standards, including the formulation of recommendations and transition algorithms, with the goal of enhancing competitiveness, management efficiency, and sustainable development of the sector in the context of Ukraine's integration into the European space.

**Presentation of the main research material.** The adaptation of an architectural and construction company to European norms and standards is a complex and multifaceted process that involves a number of significant aspects and features. In particular, adaptation requires aligning company operations with European standards such as the EN Eurocodes, which regulate requirements for the design, safety, and quality of construction structures. The process includes the implementation of quality management systems such as ISO 9001, which ensures high quality standards at all stages of company activity. The adaptation pathway places emphasis on energy-efficient solutions and sustainable development, which comply with modern environmental requirements and contribute to reducing the negative impact on the environment. The adaptation process also involves the use of advanced technologies such as Building Information Modeling (BIM), digital building passports, and monitoring systems that improve the efficiency of both design and management.

Within the operations of an individual company, the following recommendations can be applied, as presented in Table 1.

Let us take a closer look at the presented recommendations.

We begin with a very important area – regulatory compliance. In particular, the adaptation of design and construction documentation to the requirements of EN Eurocodes and the Construction Products Regulation (CPR) is a fundamental step for an architectural and construction company aiming to enter the European market. EN Eurocodes is a set of unified European standards for the design of building structures, covering all aspects from strength calculations to ensuring safety and cost-effectiveness. They replace national codes in EU countries and ensure a harmonized approach to design. At the same time, the CPR sets clear requirements for construction materials, including their quality, safety, environmental performance, and CE marking [1; 11; 21]. For successful adaptation, a company must conduct a comprehensive audit of the existing documentation to identify inconsistencies and develop a plan for their elimination.

The first step in this process is organizing staff training. Company specialists –engineers, designers, and project managers – must take specialized courses on the use of EN Eurocodes and CPR requirements. This will enable them not only to master the new standards but also to adapt internal processes to European practices. It is also essential to invest in modern design software

such as Tekla Structures, Allplan, or Autodesk Revit, which support automated design in line with Eurocodes. These tools help create accurate models, optimize calculations, and reduce the risk of errors, which is critically important for compliance with European standards.

Table 1

**Recommendations for an architectural and construction company: the path toward European standards**

| № | Area of improvement | Recommendations | Expected effect / Clarification |
|---|---|---|---|
| 1. | Regulatory compliance | Adapt design and construction documentation to meet EN Eurocodes and CPR | Access to European tenders and increased investor confidence |
| 2. | Energy efficiency | Implement certified solutions (BREEAM, LEED, nZEB) in design and construction | Reduction of operating costs and compliance with environmental financing criteria |
| 3. | Innovation and digitalization | Integrate BIM, digital building passports, and monitoring systems | Improved accuracy, transparency, and competitiveness |
| 4. | Risk and performance management | Apply NPV, IRR, CBA, and sensitivity analysis for investment project assessment | Transparent justification of decisions, risk mitigation, and investor engagement |
| 5. | Professional staff training | Improve qualifications in sustainable construction, European norms, and digital technologies | Development of a workforce capable of operating in international market |
| 6. | Institutional cooperation | Establish partnerships with municipalities, educational institutions, and European platforms | Access to grants, participation in pilot projects, and knowledge exchange |
| 7. | Quality management and certification | Implement ISO 9001, ISO 14001, and ISO 45001 systems | Increased customer trust and compliance with international client requirements |
| 8. | Inclusivity and social responsibility | Design spaces considering accessibility, sustainability, and community involvement | Strengthening of social capital and alignment with ESG criteria |

*Source: author's development.*

The expected impact of these changes is multifaceted. First, compliance with EN Eurocodes and the CPR paves the way to participation in international tenders, particularly those financed by the European Union. Many European projects require strict adherence to these standards, and companies that do not meet the requirements are simply not eligible to participate. Secondly, standardized documentation builds investor trust by reducing risks associated with regulatory non-compliance and ensuring transparency in construction processes. This is particularly important for attracting foreign partners who value clarity and reliability.

In addition, adaptation to European standards promotes harmonization of the company's internal processes. The implementation of EN Eurocodes allows for the optimization of design decisions, reduction of material costs, and improvement of the economic efficiency of construction. For example, Eurocode standards provide methodologies for accurate load calculations, enabling the creation of safer and more cost-effective structures. This also facilitates cooperation with foreign contractors and suppliers, as unified standards remove barriers related to differences in national codes.

It is especially worth noting that the transition to European standards contributes to the formation of a positive image of the company as a modern and reliable partner. Compliance with EN Eurocodes and CPR signals to clients and partners a high level of professionalism and readiness to operate at an international level. This can become a competitive advantage, especially in light of the growing demand for construction projects that meet European environmental and technical standards. In the long term, such changes not only increase the market attractiveness of the company but also promote its sustainable development and integration into the European construction ecosystem.

The next area is energy efficiency. The implementation of certified solutions such as BREEAM, LEED, or the concept of nearly zero-energy buildings (nZEB) is critically important for compliance with modern environmental standards and enhancing the competitiveness of an architectural and construction company on the European market. BREEAM (Building Research Establishment Environmental Assessment Method) and LEED (Leadership in Energy and Environmental Design) are internationally recognized certification systems that assess the environmental performance of buildings based on criteria such as energy efficiency, resource use, and environmental impact. The nZEB concept, as defined by the EU Directive on the energy performance of buildings, requires that new buildings from 2021 onward must have nearly zero energy consumption, achieved through high thermal insulation, energy-efficient systems, and the use of renewable energy sources [2; 12; 22]. To implement these standards, companies must audit their current design approaches and develop a transition strategy toward energy-efficient solutions.

The first step in implementing these standards is to engage certified experts with experience in BREEAM, LEED, or nZEB. These specialists can assess projects, develop recommendations for optimizing a building's thermal balance, and propose the use of energy-efficient materials such as low-conductivity insulation panels or multi-glazed windows. In addition, it is essential to invest in modern technologies such as heat pumps, heat recovery ventilation systems, and solar panels. For example, solar panels can provide a significant portion of a building's energy needs, while heat pumps enable efficient use of environmental energy for heating and cooling. Although these solutions require initial investments, they pay off through reduced operational costs.

The expected effect of implementing energy-efficient solutions is multifaceted. First, buildings designed according to nZEB, BREEAM, or LEED standards have significantly lower operating costs, making them attractive to end users such as tenants or property owners. For instance, heating and electricity expenses may be reduced by 50–70% compared to standard buildings. Second, such buildings have higher market value, as investors and buyers increasingly prioritize environmentally and economically sustainable properties. This also boosts demand for the company's projects, potentially expanding its order portfolio.

Another important benefit is access to funding from European funds and programs such as Horizon Europe or the European Green Deal, which actively support sustainable development projects [3]. Compliance with environmental standards is a mandatory condition for receiving grants or preferential loans for energy-efficient construction. Moreover, BREEAM or LEED certification enhances the company's reputation, positioning it as an environmentally responsible market player. This is especially important in the context of growing demand for "green" buildings aligned with sustainability principles and contributing to the reduction of $CO_2$ emissions.

The implementation of energy-efficient solutions contributes to the long-term resilience of the business. Adapting to nZEB requirements, which are mandatory for all new buildings in the EU, ensures regulatory compliance and reduces the risk of future penalties or restrictions. Furthermore, energy-efficient buildings improve user comfort, positively impacting satisfaction and loyalty. Together, these factors strengthen the company's market position, attract new clients and partners, and facilitate integration into the European sustainable construction ecosystem.

Success in the economic performance of a company also depends on innovation and digitalisation. The integration of Building Information Modeling (BIM), digital building passports, and monitoring systems is a key component in enhancing the competitiveness of architectural and construction companies in today's European market [4; 13; 14; 23; 24]. BIM is a technology that allows for the creation of three-dimensional digital models of buildings, integrating all stages of a project's lifecycle – from design to construction and operation. Digital building passports provide transparent records of materials, technologies, and characteristics of the facility, aligning with European standards for sustainability and environmental responsibility. Monitoring systems, such as IoT sensors, allow real-time tracking of building conditions, optimizing operation and enabling timely identification of potential issues. To implement these technologies, companies must invest in advanced software such as Autodesk Revit, ArchiCAD, or Tekla, and organize staff training to ensure effective use of these tools.

The first step toward digitalisation is the implementation of BIM, which requires not only the acquisition of software but also the reorganisation of the company's internal processes. BIM enables the creation of a unified digital model that integrates architectural, structural, and engineering data, reducing the risk of design and construction errors. For instance, BIM can detect clashes between systems (such as the intersection of ventilation ducts and structural elements) before construction begins, saving time and costs. To achieve this, certified BIM managers must be engaged, and training sessions for architects, engineers, and other professionals should be conducted so they can work within a unified digital environment. In addition, companies should integrate BIM with project management systems such as Primavera or MS Project to optimise planning and control.

Digital building passports are another essential tool aligned with European requirements for transparency and sustainability. These passports contain detailed information about construction materials, their origin, environmental impact, and recyclability. They also facilitate asset management during the building's operational phase and ensure compliance with the Construction Products Regulation (CPR). To create digital passports, companies can use specialised platforms such as Madaster or OneClick LCA, which automate data collection and analysis. Implementing such systems requires cooperation with material suppliers and subcontractors to ensure data accuracy, as well as staff training for effective use of these tools.

Monitoring systems based on Internet of Things (IoT) technologies allow real-time tracking of building conditions, which is especially important for energy-efficient and "smart" buildings. For example, sensors can monitor temperature, humidity, air quality, or energy consumption, providing data to optimise operational costs. These systems also enable predictive maintenance, reducing the risk of failures and extending building lifespan. To implement monitoring systems, companies need to invest in IoT equipment and integrate it with BIM models, ensuring a holistic approach to facility management. Additionally, data analysts should be involved to interpret the collected information.

The expected effect of digitalisation is significant: improved design accuracy reduces errors and rework, which can lower costs by 10–20%. Shortened project delivery times through automation and better coordination among stakeholders enable the company to handle more contracts. The transparency provided by digital tools increases trust among clients and investors, which is especially important for participating in European tenders where BIM is often a mandatory requirement. In the long term, digital transformation strengthens the company's market position, supports its integration into the European construction ecosystem, and provides a competitive edge through the use of advanced technologies.

Risk and performance management. The application of financial tools such as NPV (Net Present Value), IRR (Internal Rate of Return), CBA (Cost-Benefit Analysis), and sensitivity analysis is crucial for improving investment project management efficiency in architectural and

construction companies [5; 15; 16; 25]. These methods allow the evaluation of a project's economic feasibility, profitability, and the forecasting of risks associated with market volatility, such as rising material costs or changes in interest rates. For example, NPV helps assess whether a project will generate profit in the long term, considering discounted cash flows, while IRR identifies the minimum return rate required to break even. To implement these tools, companies must engage qualified financial analysts and invest in specialised software such as Oracle Crystal Ball or Microsoft Excel with financial modules.

The first step toward effective risk management is the establishment of a financial modelling system that includes NPV, IRR, and CBA. Cost-benefit analysis (CBA) allows for comparing the project's costs with its potential benefits, including not only financial, but also social and environmental aspects – a crucial factor for European clients who value sustainability principles. Sensitivity analysis complements these methods by evaluating how changes in external factors such as energy prices or construction delays affect a project's financial outcomes. To do this, it is necessary to develop "best-case", "baseline", and "worst-case" scenarios in order to prepare for potential challenges. The implementation of such tools requires staff training and the integration of financial models with project management systems like Primavera or Jira.

The expected effect of using these tools includes increased transparency in decision-making, which is key to attracting investors and partners. Clear financial models that provide well-grounded justifications for costs and expected returns build trust in the company – especially in the context of international tenders, where investors demand detailed economic assessments. For instance, European institutions like the European Investment Bank often require NPV and IRR analysis to evaluate funded projects. Moreover, sensitivity analysis enables the company to prepare risk mitigation strategies in advance, such as responding to rising material costs or supply chain delays, thereby reducing the likelihood of financial losses.

Another advantage is cost optimisation and improved resource efficiency. Financial modelling allows companies to identify the most expensive aspects of a project and find ways to optimise them – for example, by choosing more cost-effective yet high-quality materials or reducing construction timelines. CBA also helps assess the feasibility of investing in energy-efficient technologies that may require higher initial costs but lead to long-term savings. This enables the company to make well-balanced decisions between cost and quality, which is essential for competing on the European market.

Undoubtedly, implementing these tools supports the company's strategic development and adaptation to European standards. The use of NPV, IRR, and sensitivity analysis is standard practice among leading European construction companies, making them essential for firms seeking integration into the European ecosystem. This not only enhances competitiveness but also enables companies to participate in complex infrastructure projects that require a high level of financial transparency and risk management. In the long term, these tools promote sustainable company growth, reduce financial risks, and strengthen its reputation as a reliable international partner.

Professional staff training. Improving employee qualifications in the fields of sustainable construction, European standards, and digital technologies is crucial for adapting to EU requirements [6; 17; 26]. It is necessary to organise regular training sessions, certification courses (e.g., in BIM or Eurocodes), and cooperation with international educational platforms. It is also important to attract young professionals through internship programs and partnerships with higher education institutions.

The expected outcome is the formation of a skilled workforce capable of competing in the international market. Qualified professionals enhance project quality, reduce the risk of errors, and contribute to the company's innovative development. This also attracts clients who value professionalism and compliance with modern standards.

Institutional cooperation. Establishing partnerships with local authorities, educational institutions, and European platforms is a strategic step for an architectural and construction company [7; 18; 27] aiming to integrate into the European ecosystem and meet contemporary standards. Cooperation with local authorities enables access to public projects, such as building social infrastructure or renovating public spaces – often financed by local or European funds. Partnerships with universities and research institutions support the recruitment of young talent and the development of innovative solutions such as new construction technologies or energy-efficient materials. Participation in European platforms like Horizon Europe or BuildUp allows the company to join pilot projects, receive grants, and exchange experience with international partners. To implement this direction, it is necessary to develop a cooperation strategy, identify key partners, and establish a dedicated unit to coordinate such initiatives.

Specifically, partnerships with local authorities may include joint development of urban development plans, construction of schools, hospitals, or sports facilities. Such projects are often supported by European funds, which require compliance with sustainable development standards and transparency. For this, companies need to establish regular dialogue with municipalities, participate in public hearings, and propose solutions that meet the needs of local communities. This also involves adapting projects to European standards, such as EN Eurocodes or energy efficiency requirements, which increases the chances of successful financing and implementation.

Partnerships with educational institutions, particularly universities and technical colleges, open opportunities for attracting qualified personnel and introducing innovations. Cooperation may include creating internship programs for students, joint research projects, or organizing training courses using modern technologies such as BIM or energy-efficient design. For example, partnerships with technical universities can facilitate the development of new materials or construction methods that enhance the company's competitiveness. Additionally, such initiatives allow the company to position itself as a socially responsible employer, attracting young specialists and contributing to the formation of a talent pool.

Participation in European platforms such as Horizon Europe, EIT Climate-KIC, or the European Construction Sector Observatory is a key to accessing funding and advanced expertise. These platforms support innovative projects in sustainable construction, digitalization, and energy efficiency by providing grants, consultations, and opportunities for international cooperation. For instance, Horizon Europe funds pilot projects aimed at creating "smart" cities or implementing low-carbon footprint technologies. To participate in such programs, companies need to develop project proposals aligned with European priorities and establish contacts with international partners. This also requires qualified personnel capable of working with European standards and documentation.

The expected effect of institutional cooperation is multifaceted. First, partnerships provide access to additional funding through grants and concessional loans, reducing the financial burden on the company. Second, experience exchange with international partners promotes the implementation of advanced technologies and practices, improving project quality and company competitiveness. Third, such initiatives strengthen the company's reputation as an innovative and reliable market player, facilitating client and investor attraction. In the long term, institutional cooperation promotes the company's integration into the European construction ecosystem, opening new markets and growth opportunities.

Quality management and certification. The implementation of quality management systems (ISO 9001) [10], environmental management (ISO 14001) [9], and occupational health and safety (ISO 45001) [8] is a crucial step for an architectural and construction company aiming to comply with international standards and strengthen its position in the European market. ISO 9001 establishes requirements for the quality management system, ensuring consistency and high quality of processes, products, and services. ISO 14001 focuses on reducing the company's environmental

impact, promoting sustainable development, while ISO 45001 aims at creating safe working conditions and minimizing health risks for employees. To implement these standards, the company must conduct a comprehensive audit of internal processes, develop appropriate documentation, and engage accredited certification bodies for conformity assessment [19; 28]. This process also involves staff training and integrating management systems into daily operations.

The first stage of the implementation is an audit of internal processes to identify non-compliance with ISO standards. For example, for ISO 9001, it is necessary to assess how the company manages the quality of design, material procurement, and construction work execution. For ISO 14001, the audit covers an analysis of the company's environmental impact, including resource use, waste disposal, and $CO_2$ emissions. ISO 45001 requires verification of working conditions, availability of personal protective equipment, and emergency response procedures. Based on the audit, an action plan is developed, which includes creating documentation such as quality policies, environmental plans, and safety instructions. To automate these processes, software such as QMS systems can be used, facilitating monitoring and control.

The next step is staff training and involvement of certification bodies. Company employees, from managers to workers, must be familiarized with the standards' requirements and undergo appropriate training. For instance, for ISO 9001, personnel need to be trained in quality management methods, including document control and customer feedback analysis. For ISO 14001, it is important to prepare employees to work with environmental procedures such as waste sorting or the use of energy-efficient technologies. After preparation, the company must contact accredited organizations such as Bureau Veritas or TÜV for a certification audit. This process may take several months, but successful completion confirms the company's compliance with international standards.

The expected effect of implementing these standards is multifaceted. Firstly, certification to ISO 9001, ISO 14001, and ISO 45001 significantly increases the trust of clients and investors, as it is internationally recognized proof of high operational standards. This is especially important for participation in European tenders, where ISO certificates are often a mandatory requirement. Secondly, implementing these systems contributes to optimizing internal processes: for example, ISO 9001 helps eliminate inefficient procedures, while ISO 14001 allows reducing costs related to energy consumption and waste disposal. In addition, ISO 45001 reduces the risk of workplace accidents, lowering expenses for insurance payments and downtime.

In the long term, certification helps strengthen the company's reputation and its integration into the European construction ecosystem. Compliance with international standards opens access to new markets and partnerships, as many European clients prefer to cooperate with certified companies. Moreover, implementing these systems helps the company meet ESG (environmental, social, and governance) requirements, which is important for attracting investors who support sustainable development principles. Thus, investing in certification not only enhances competitiveness but also ensures the company's sustainable growth by reducing risks and increasing operational efficiency.

Inclusiveness and social responsibility. Designing spaces according to the principles of inclusiveness, sustainable development, and community involvement is not only a current requirement of European standards but also a strategic direction for an architectural and construction company aiming to strengthen its reputation and competitiveness. Inclusiveness implies creating environments accessible to all, including people with disabilities, elderly individuals, and families with children, which complies with European directives such as the EU Accessibility Act. Sustainable development includes the use of ecological materials and technologies that reduce environmental impact, while community involvement in planning helps consider their needs and enhances the social value of projects. Implementing ESG (environmental,

social, and governance) principles into the company's strategy allows systematic integration of these aspects into all business processes [20; 29; 30]. To realize this direction, it is necessary to develop inclusiveness policies, conduct staff training, and cooperate with accessibility and sustainability experts.

The first step toward creating inclusive spaces is adapting projects to the requirements of universal design. This includes the installation of ramps, elevators, tactile indicators for people with visual impairments, as well as comfortable pedestrian zones and public spaces that consider the needs of all population groups. For example, designing buildings with wide door openings and barrier-free entrances increases their accessibility for people with disabilities. Companies need to cooperate with inclusive design experts and conduct consultations with community representatives to ensure that projects meet their needs. Furthermore, using standards such as UNI EN 17210 (accessibility and usability of the built environment) helps harmonize projects with European requirements.

Sustainable development is another key aspect, which involves the use of ecological materials such as wood from certified sources, recycled concrete, or insulation materials with a low carbon footprint. The company can integrate energy-efficient technologies such as solar panels or rainwater harvesting systems to reduce the environmental impact of buildings. Implementing ESG principles in this context means not only environmental responsibility but also transparent management, including reporting on the company's impact on the environment and society. To achieve this, it is necessary to implement monitoring systems, such as digital building passports that document the ecological characteristics of materials, and to cooperate with suppliers who meet sustainability standards.

Involving local communities in the planning process is an important element of social responsibility. This may include holding public hearings, surveys, or workshops to consider residents' opinions regarding future projects. For example, when designing public spaces such as parks or cultural centers, community involvement allows the creation of facilities that meet their needs and promote social cohesion. Such an approach not only improves project quality but also strengthens the company's ties with local stakeholders, fostering long-term loyalty and support. To implement this direction, companies need to develop communication strategies and engage specialists in social management.

The expected effect of implementing the principles of inclusiveness and social responsibility is significant. First, it increases the company's social capital by shaping its image as a socially responsible business aligned with European values. Second, compliance with ESG criteria attracts investors who increasingly support projects focused on sustainable development and social benefit. Third, inclusive projects improve the quality of life for communities, which promotes customer and partner loyalty. In the long term, these initiatives strengthen the company's reputation, open access to European markets and funding programs such as the European Green Deal, and contribute to its integration into the global sustainable construction ecosystem.

It is very important to develop a flexible operational algorithm for the defined direction (Table 2). Implementing recommendations to enhance the competitiveness of an architectural and construction company on the path to European standards should reasonably begin with diagnosing the current state: analysis of the regulatory framework, digital systems, professional potential of personnel, and financial stability. Based on this, a roadmap for changes is formed – with clear priorities, deadlines, and responsible executors. As initial actions, it is advisable to adapt technical documentation in accordance with EN Eurocodes and CPR, as well as to start digital transformation through the implementation of BIM, ERP, CRM, and digital building passports.

Alongside technological transformations, targeted staff training is crucial – upgrading employees' qualifications in the fields of ecological design, digital tools, and sustainable

construction requirements. This will increase the team's readiness to operate in European markets and ensure the sustainable transformation of the enterprise. The next logical step is establishing institutional connections: partnerships with municipalities, educational institutions, and international platforms open access to innovation, grant funding, and pilot projects.

*Table 2*

**Algorithm for transition to European standards for an architectural and construction company**

| № | Stage / Step | Description of actions | Expected result / Explanation |
|---|---|---|---|
| 1. | Current state analysis | Conduct an audit of the regulatory, technical, personnel, and digital base of the company | Identification of gaps regarding compliance with European standards |
| 2. | Strategic roadmap formation | Define implementation priorities: regulations, energy efficiency, digitalization, etc. | Agreed action plan with timelines and responsible parties |
| 3. | Regulatory adaptation | Translation, adaptation, and integration of EN Eurocodes, CPR, ISO into internal regulations | Compliance with European clients' and tenders' requirements |
| 4. | Digital transformation | Implementation of BIM, digital building passports, ERP/CRM systems | Increased transparency, accuracy, and management efficiency |
| 5. | Professional staff training | Training in energy-efficient design, digital tools, international standards | Formation of a competent team for working in the European market |
| 6. | Institutional integration | Establish cooperation with municipalities, universities, international platforms | Access to grants, participation in pilot projects, experience exchange |
| 7. | Quality management and certification | Implementation of ISO 9001, 14001, 45001 systems | Increased client trust, compliance with international partners' requirements |
| 8. | Inclusiveness and ESG orientation | Integration of principles of sustainable development, accessibility, community involvement in design | Increased social capital, compliance with ESG criteria |
| 9. | Monitoring and adjustment | Regular progress assessment, strategy adjustment based on audit results | Flexible change management, improved implementation effectiveness |

*Source: author's development.*

The final stage should highlight the integration of quality management systems according to ISO 9001, 14001, and 45001, as well as a focus on social responsibility and ESG criteria. Orientation towards inclusiveness, community involvement, and barrier-free design solutions allows the company not only to comply with international standards but also to build social capital. Thus, the systematic implementation of these recommendations enables the architectural and construction enterprise to consistently transform into a flexible, environmentally sustainable structure capable of competing in the European market.

Thus, the algorithm for transitioning an architectural and construction company to European standards consists of nine key stages that cover all aspects of the enterprise's activities. Starting with an analysis of the current state to identify gaps in compliance with European norms, the company develops a strategic roadmap that includes implementation priorities in the areas of

regulatory adaptation, energy efficiency, and digitalization. The integration of EN Eurocodes, CPR, and ISO into internal regulations, as well as the adoption of modern technologies such as BIM and ERP/CRM systems, ensures increased transparency and managerial efficiency. Professional staff training, institutional integration, and quality management through certification according to international standards form a competent team capable of operating in the European market. Emphasizing inclusiveness and ESG principles enhances the company's social capital, while regular monitoring and strategy adjustments provide flexible change management, facilitating the successful implementation of European standards.

**Conclusions.** Thus, the study emphasizes the necessity of a systematic approach to adaptation that considers various aspects of the company's operations. First and foremost, regulatory compliance is crucial, as it provides access to European tenders and increases investor trust, demonstrating that success in the international market is impossible without proper adaptation of design and construction documentation to the requirements of EN Eurocodes and CPR. Energy efficiency is also a key area of improvement, as the implementation of certified solutions such as BREEAM, LEED, and nZEB helps reduce operating costs and meet environmental funding criteria. This highlights the importance of integrating modern technologies into design and construction, which is essential for achieving sustainable development.

Innovation and digitalization, highlighted in the recommendations, are important for enhancing the company's accuracy, transparency, and competitiveness. The integration of BIM technologies and digital building passports allows optimization of management and quality control processes, which is critical for compliance with European standards. Risk and performance management, based on financial metrics such as NPV, IRR, and CBA, helps ensure transparent decision-making and reduce risks associated with investment projects. This contributes to attracting more investors and improving the company's financial position.

Professional staff training is an integral part of the transition to European standards. Enhancing qualifications in the fields of sustainable construction, European regulations, and digital technologies will ensure the development of a workforce ready to operate in the international market. This, in turn, will strengthen the company's position amid global competitive challenges. Institutional cooperation with municipalities, educational institutions, and European platforms opens new opportunities for access to grants and participation in pilot projects. It facilitates experience exchange and the implementation of innovations, which are essential for the company's development towards European standards.

Quality management and certification according to international standards ISO 9001, ISO 14001, and ISO 45001 increase client trust and meet the requirements of international partners. This is an important step in ensuring the company's competitiveness in the European market. Inclusiveness and social responsibility, which consider the principles of sustainable development and accessibility, enhance the company's social capital and ensure compliance with ESG criteria. This is especially important for building a positive corporate image in the European context. Finally, regular monitoring and strategy adjustment based on conducted audits allow identification of deviations, optimization of resources, and adaptation of plans to changes in the external environment. This emphasizes the importance of flexible change management to improve the effectiveness of implementing all stages of the transition to European standards.

Thus, implementing the recommendations and transition algorithm to European standards is critically important for architectural and construction companies seeking success in the international market by ensuring high quality, environmental responsibility, and social equity in their operations.

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