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THE ROLE OF INTELLECTUAL PROPERTY IN THE FORMATION OF THE MARKET VALUE OF CONSTRUCTION COMPANIES

РОЛЬ ІНТЕЛЕКТУАЛЬНОЇ ВЛАСНОСТІ У ФОРМУВАННІ РИНКОВОЇ ВАРТОСТІ БУДІВЕЛЬНИХ КОМПАНІЙ

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Intellectual property (IP) significantly influences the construction industry, which thrives on innovation to meet the escalating demands for environmental sustainability, energy efficiency, and project uniqueness. This article elaborates on the critical role of IP in enhancing the market value and competitive edge of construction companies, alongside a detailed exploration of various IP forms prevalent in this industry, including patents, copyrights, trademarks, and trade secrets. The narrative underscores the essential role of patents, which protect technical innovations such as new building materials and construction technologies that offer improved thermal insulation, durability, and even self-healing properties. These patents safeguard the inventor's rights and fortify the company's market position by enabling a temporary monopoly on innovative products. Copyrights are highlighted as vital for protecting architectural designs and project management methodologies. These legal tools ensure that the artistic expressions and unique designs remain exclusive to the creator, thus fostering a culture of innovation and protecting the economic interests of the designers. Trademarks are discussed in the context of their importance in branding, significantly impacting a company's image by distinguishing it from competitors. The article also emphasises the strategic importance of managing IP effectively, noting that companies with a robust IP portfolio are more likely to attract investment and less likely to encounter financial instability. This management involves protecting innovations from competitors and leveraging these assets to secure financial resources and explore new market opportunities. Furthermore, the article advocates adopting comprehensive IP management strategies to ensure long-term business growth and success. Effective IP management is presented to navigate the competitive and challenging landscape of the construction industry, highlighting the potential of IP assets to drive innovation, attract investments, and enhance the overall market value of the companies involved.

Keywords: Intellectual property, IP assets, intangible assets, brand of a construction company, development of construction enterprises, methodical approaches to cost estimation.

Інтелектуальна власність (ІВ) має значний вплив на будівельну галузь, яка процвітає завдяки інноваціям для задоволення зростаючих вимог до екологічної стійкості, енергоефективності та унікальності проєктів. У цій статті розглядається важлива роль ІВ у підвищенні ринкової вартості та конкурентних переваг будівельних компаній, а також детально досліджуються різні форми ІВ, поширені в цій галузі, включаючи патенти, авторські права, торгові марки та комерційні таємниці. В статті підкреслюється важлива роль патентів, які захищають технічні інновації, такі як нові будівельні матеріали та будівельні технології, що пропонують покращену теплоізоляцію, довговічність і навіть здатність до самовідновлення. Ці патенти захищають права винахідників і зміцнюють позиції компанії на ринку, забезпечуючи тимчасову монополію на інноваційні продукти. Авторські права є життєво важливими для захисту архітектурних проєктів та методологій управління проєктами. Ці правові інструменти гарантують, що художні засоби вираження та унікальні дизайни залишаються ексклюзивними для творця, таким чином сприяючи культурі інновацій та захищаючи економічні інтереси дизайнерів. Торгові марки розглядаються в контексті їхньої важливості для брендингу, що суттєво впливає на імідж компа-

нії, вирізняючи її серед конкурентів. У статті також підкреслюється стратегічна важливість ефективного управління ІВ, зазначаючи, що компанії з надійним портфелем ІВ мають більше шансів залучити інвестиції і менше стикаються з фінансовою нестабільністю. Таке управління передбачає захист інновацій від конкурентів і використання цих активів для забезпечення фінансових ресурсів та вивчення нових ринкових можливостей. Крім того, у статті йдеться про необхідність прийняття комплексних стратегій управління ІВ для забезпечення довгострокового зростання та успіху бізнесу. Ефективне управління ІВ допомагає орієнтуватися в конкурентному та складному середовищі будівельної галузі, підкреслюючи потенціал активів ІВ для стимулювання інновацій, залучення інвестицій та підвищення загальної ринкової вартості компаній, що беруть участь у будівництві.

Ключові слова: інтелектуальна власність, активи ІВ, нематеріальні активи, бренд будівельної компанії, розвиток будівельних підприємств, методичні підходи до оцінки вартості.

Introduction. The relevance of this research is driven by the current market conditions, where construction companies are forced to compete not only on the quality and cost of services but also on the innovation and uniqueness of their projects. The role of intellectual property (IP) becomes crucial in this context. It allows companies to provide legal protection for their innovations and commercial advantages. Intellectual property can significantly increase the market value of a construction company, making it more attractive to investors. Patents, copyrights, trademarks, and other forms of intellectual property can demonstrate a company's innovativeness and potential for long-term development.

Additionally, with new technologies such as 3D printing in construction, intelligent building materials, and digital project management systems, there is an increasing need to evaluate and protect technological innovations that can become critical assets for the company. The regulations in the field of intellectual property are constantly changing, impacting the strategies for managing intellectual property in construction companies. Adapting to these changes and using legislative innovations to protect and commercialise intellectual property is essential in increasing market value. These aspects underscore the importance and relevance of researching intellectual property's role in forming and increasing construction companies' market value in modern economic conditions.

Analysis of recent research and publications. A significant body of literature focuses on the role of patents in enhancing the competitive edge and market value of construction firms. Scholars such as V. Virchenko [1] and I. Chunytska & O. Bondaruk [6] discuss how patents serve as a barrier to entry for competitors, protecting innovative construction materials and methods that can lead to increased market share and higher profit margins. The work of O. Yurchenko [7] complements this by illustrating the positive correlation between patent portfolios and the financial performance of firms in technology-intensive industries, including construction. These studies collectively underline those patents secure innovations and boost investor confidence, contributing to a firm's valuation.

Copyrights protect construction companies' unique architectural designs and creative content. According to a study by O. Granstrand [12], copyrights play a critical role in safeguarding construction projects' aesthetic and functional aspects, which can be key differentiators in the marketplace. S. Rohovyi and O. Yurchenko [16] extend this argument by demonstrating how copyrights can add to a company's assets, enhancing its overall market value. These works highlight the necessity of protecting artistic and architectural integrity to maintain exclusivity and command premium pricing.

The influence of trademarks on building brand equity and market value in the construction industry is well documented. As Baharom, Mohammad, Habib Siti, and Ismail Syuhaida [10] noted, trademarks help establish a recognisable identity and reputation, which are crucial for consumer trust and loyalty. This review maps the current landscape of IP management in construction and sets the stage for future research on optimising IP strategies to maximise market value.

The purpose of the article is to research intellectual property in the formation of the market value of construction companies.

Objectives of the study:

– identify leading approaches to understanding the role of intellectual property in the formation of the market value of construction companies;

– assess the impact of different types of intellectual property on the market value of companies;

– develop recommendations for construction companies regarding optimal strategies for using and protecting intellectual property to increase market value.

Research results. Intellectual Property (IP) plays a crucial role in the construction industry, as this field has encountered a need for innovation to meet increasing demands for environmental sustainability, energy efficiency, and uniqueness of projects. Recognition and protection of IP can not only provide legal protection for innovations but also significantly enhance the market value of construction companies [14].

Specifics of Intellectual Property in the Construction Industry. In the construction industry, IP encompasses a wide range of assets, from technical innovations in the form of patents for new building materials and technologies to copyrights on architectural designs and know-how in project management. A significant feature is the importance of patents for new materials that can provide better thermal insulation, durability, or even self-healing properties.

Trademarks also play an essential role in shaping companies' images, as they help differentiate the services of one contractor from another, creating associations with reliability and quality of work. It is vital in the context of globalisation and the increase in the share of transnational projects [4].

The market value of construction companies is closely related to their ability to innovate and effectively manage their IP. Companies with a significant intellectual property portfolio often have better chances of attracting investment and credit resources, as they are considered less risky for investors. It provides them with the necessary financial resources to develop and implement new projects. Market value also affects the strategic decisions of a company, including mergers and acquisitions, entry into new markets, and portfolio expansion. Effective management of IP can help a company protect its innovations from competitors and actively commercialise them, creating new revenue streams.

In an environment of increasing competition and demands for innovativeness in the construction industry, intellectual property becomes a strategic asset that can significantly influence the market value of companies. Considering and effectively managing these assets allows companies to stay afloat and actively develop and adapt to changes in the global construction environment. Therefore, IP management strategies should be given maximum attention to ensure long-term success and growth in market value.

The construction industry is at the forefront of technological innovation and creative design, where intellectual property rights, particularly patents and copyrights, play pivotal roles. These legal tools protect the inventors' and creators' rights and encourage ongoing innovation, contributing to the industry's growth and competitiveness [3].

1. Patents are crucial in protecting new technologies and materials developed in the construction industry. These innovations often involve significant research and development efforts and considerable investment. Patents grant inventors exclusive rights to their innovations, allowing them to prevent others from making, using, or selling their inventions without permission for a limited period, typically 20 years from the filing date.

The importance of patents in construction cannot be overstated. They cover many areas, including new materials, construction methods, and machinery. For instance, developing eco-friendly materials that reduce environmental impact or innovative structural systems that provide enhanced safety or efficiency are often patentable. Patents provide exclusivity, protecting the inventors and giving them a competitive edge in the market. By securing a patent, companies can justify the high costs associated with R&D, knowing that they have a temporary monopoly on the use of the technology [13].

Moreover, patents stimulate a healthy competitive environment where other firms are encouraged to invent around existing patents, contributing to further innovation and development within the industry; this continuous cycle of innovation enhances the industry's ability to tackle new challenges, such as those posed by climate change and urbanisation, with advanced technological solutions.

While patents cover technological aspects, copyrights protect artistic expression in design documentation and architectural solutions. Copyrights in the construction industry are automatically granted upon creation of original works such as drawings, specifications, architectural plans, and even 3D models. These rights prevent others from copying or distributing the copyrighted material without the copyright owner's consent.

Architectural works display unique aesthetic or novel characteristics and are prime examples of copyright-protected materials. Copyrights help maintain the integrity and recognition of the creator's effort, ensuring that architects and designers are compensated for their work and creativity. This protection recognises creative talent and provides an economic incentive that

promotes further artistic endeavour within the industry [14].

2. Copyrights also play a significant role in maintaining the standards and quality of architectural designs. They ensure that the designs are not diluted through unauthorised use, which can lead to a loss of aesthetic and functional integrity. This protection is critical in the digital reproduction and distribution era, where designs can be easily copied and used without proper authorisation.

The dual protection afforded by patents and copyrights drives the construction industry forward. Patents encourage the development of new materials and methods that can improve efficiency and sustainability. At the same time, copyrights protect the creative aspects of architectural work, ensuring that innovation is not just about utility but also about aesthetics and design quality. For construction companies, managing patents and copyrights is essential for fostering an innovation environment while protecting their intellectual assets. It enhances their market position and contributes to the broader architectural and construction landscapes by setting high standards for innovation and creativity.

3. Trademarks and brands in construction companies. Trademarks in the construction industry often encompass logos, slogans, and brand names that are instantly recognisable and evoke a sense of reliability and quality. A strong brand can be a significant determinant of business success. It communicates the company's values, strengths, and the quality of its services or products, building trust with clients, partners, and stakeholders.

For construction companies, where projects often involve significant investments and risk, the reputation signified by a trademark can influence client decisions profoundly. A well-regarded brand can lead to preferred vendor status, easier negotiations, and repeat business. For instance, a construction company known for timely delivery, high-quality outputs, and safety can leverage its brand to secure more lucrative contracts and command higher prices [2].

Building a solid brand in construction also involves marketing strategies that highlight unique selling propositions and superior service capabilities. Companies can effectively use their trademarks in marketing and operations to create a lasting impression that differentiates them from competitors in a crowded marketplace.

4. Know-how and trade secrets in the construction business. While trademarks protect a company's identity, know-how and trade secrets protect its operational essence. In construction, know-how could include specialised knowledge in using innovative materials, unique construction methodologies, or efficient project management techniques. These are gained through experience and are not widely known outside the company, making them invaluable competitive assets. Construction trade secrets might encompass proprietary formulas for building materials, design techniques, or information on supplier negotiations that could provide an edge over competitors [10]. Protecting this information is crucial since it can be the basis for a company's competitive advantage (Table 1).

Unlike patents, trade secrets are protected without registration as long as the information remains confidential and benefits the company economically. Protecting trade secrets is indefinite – it lasts as long as the information remains a secret. However, this also means protection can be lost instantly if the secrecy is compromised. Therefore, construction companies must implement strict confidentiality protocols and security measures to safeguard their trade secrets effectively [9].

Trademarks, brands, and trade secrets are indispensable assets in the construction industry. They help companies differentiate themselves, build client trust, and protect invaluable business insights and proprietary technologies. Effective management of these intellectual property elements is crucial for any construction company aiming to maintain its competitive advantage and achieve long-term success in the industry. As the construction sector continues to evolve with new technologies and complex projects, the strategic importance of these intellectual properties is set to grow even further, highlighting the need for robust strategies to manage and protect them [5].

The construction industry is characterised by fierce competition and continuous innovation. Companies strive to improve efficiency, reduce costs, and enhance the quality of construction. Intellectual property is pivotal in safeguarding these innovations, providing companies with the legal tools to protect their competitive advantages.

Patents are one of the most direct ways to protect new inventions in the construction industry, such as new building materials, tools, or methods. By securing a patent, a company can prevent competitors from using its inventions, thereby maintaining a competitive edge in the market. For example, a patented energy-efficient

Table 1

Comparison variations use and protection of intellectual property construction companies (developed by the author)

Kind of intellectual property	Key difference	Principle of use	Way protection	Possibility development
Patents for technologies and materials	Protection innovations in construction materials and methods	Use in exclusive projects, licensing	Registration at the patent office, legal protection	Development of new technologies, improvement materials
Design copyright	Protection author's originality of design and architecture	Use in projects, publications, reproductions	Registration copyright, legal protection	Creation of new design solutions
Trademarks	Brand and reputation protection companies	Use in advertising, documentation, and products	Registration trademark, legal protection	Brand expansion, entry into new markets
Commercial secrets	Protection of informalised know-how information	Internal use for promotion efficiency	signing, internal politicians' privacy	Improve internal processes

Source: [4; 10]

building material distinguishes the company that developed it and opens new business opportunities [11].

Many construction companies keep specific methodologies or processes as trade secrets. These might include unique construction techniques or specialised cost-estimation methods that give a company a competitive advantage. Protecting these trade secrets is crucial for maintaining a company's market position and ensuring that competitors do not replicate its operational efficiencies.

Copyrights protect architectural designs, engineering drawings, and other creative works. They ensure that a company's creative output cannot be used without permission, thus maintaining exclusivity and adding to its competitive advantages. The protection afforded by IP helps maintain a competitive edge and aids in building a reputation for innovation and quality. This reputation is critical in the construction industry, where the stakes are high, and the impact of each project on a company's portfolio is significant.

Intellectual property is increasingly recognised as a valuable intangible asset that can significantly enhance a company's ability to attract investments. In the construction industry, where projects require substantial capital, the ability to showcase well-managed IP assets can make a company more attractive to investors and lenders [1; 8]:

IP assets contribute to the overall valuation of a company. Patents, trademarks, and copyrights can be appraised and included as intangible assets on a company's balance sheet. This enhanced valuation is appealing to investors looking for companies with solid growth potential;

– investors are typically risk-averse and look for businesses that have a competitive moat. Intellectual property rights provide such a moat by protecting a company's innovations from competitor replication. This security can make a construction company a more reliable investment;

– IP assets open avenues for additional revenue through licensing agreements, where a company can allow others to use its patented technologies or designs in exchange for a fee. This potential for generating licensing revenue can be an attractive point for investors;

– companies with robust IP portfolios are often considered desirable partners for strategic alliances or joint ventures. These collaborations can lead to shared development costs, expanded market access, and combined expertise, all of which are attractive to investors.

In construction, intellectual property can include patents on innovative building materials or construction techniques, copyrights on architectural designs, trademarks on brand names, and trade secrets such as specialised processes or proprietary technologies [5]. Each type of IP requires a different valuation approach

due to its distinctive nature and impact on the company's operations and profitability.

1. Cost approach. The cost approach estimates the IP value based on the cost required to recreate it. This method is beneficial when valuing IP that involves significant research and development, such as patents or proprietary technology. The cost approach considers the historical cost of developing and reproducing the IP. It includes direct costs like materials and labour, indirect costs like overheads and the opportunity cost of development time. For construction companies, the cost approach can help assess the investment in developing unique construction materials or innovative building techniques [6]. However, this method may only partially capture the future economic benefits of these assets, especially if they provide a competitive edge in the market.

2. Market approach. The market approach determines the value of IP by comparing it to similar intellectual properties sold or licensed in the market. This approach hinges on sufficient data on comparable transactions, which can be challenging in the construction industry, where many IP transactions are private.

When applicable, this method can offer a realistic valuation of trademarks or copyrights based on recent sales of similar architectural designs or branding agreements within the industry. It provides a market-relevant benchmark, assuming that the comparative IP shares similar profitability and risk characteristics.

3. Income approach. The income approach is one of the most widely used methods for IP valuation, particularly suitable for IP expected to generate future revenue. This method estimates the present value of future income streams attributable to the IP. The income approach involves forecasting the future cash flows from the IP and discounting them to their present value using an appropriate discount rate [16].

In construction, the income approach is precious for evaluating patents and trade secrets that reduce costs or enhance revenue. For example, a patented construction method that speeds up building processes may result in significant savings and faster project completions, directly impacting the company's bottom line.

4. Relief from royalty method. As a subset of the income approach, the relief from royalty method estimates the value of IP by assuming that if the company did not own the IP, it would have to pay for its use. This method calculates the present value of hypothetical royalty payments that the company avoids by owning the IP. This approach effectively values copyrights in unique architectural designs and trademarks where licensing is common [12]. It helps construction companies understand the savings made by owning these assets rather than licensing them from others, providing a clear picture of the IP's intrinsic value.

Valuing IP in the construction industry requires a multifaceted approach tailored to the specific type of IP and its role in the company's operations.

Table 2

Rating efficiency using methodical approaches evaluations cost intellectual property in the activity construction companies (developed by the author)

Way evaluations	Principle of use	Key advantages	Economic effect	Legal effect
Expensive approach	Measurement cost playback or substitution of IP	Accuracy in assessment of nested resources	Improves understanding of capital investments	Helps in solving disputes of compensation losses
Market approach	Comparison with similar objects of IP, which were sold on the market	Accessibility market data	Reflects real market cost	Used to define market standards
Profitable approach	Prognostication future income from the use of IP and their discounting	Accounting potential earnings of IP	Evaluates the potential impact of IP on the company's income	Justifies investment solutions
Royalty method	Rating savings from the use of IP if it had to be licensed from the outside	Measures straight savings from ownership of IP	Defines specific money cost ownership of IP	Confirmation of exclusivity of IP rights

Source: developed by the author

Whether through cost, market, income, or relief from royalty methods, these approaches provide comprehensive tools to estimate the economic value of intellectual property. For construction companies, a precise IP valuation enhances financial and strategic decision-making and bolsters the company's ability to attract investments and negotiate market transactions. As the industry innovates, accurately valuing IP becomes crucial for maintaining competitiveness and driving growth.

Conclusion. IP is integral in differentiating companies within the highly competitive construction market. Patents for novel building materials and construction techniques protect these innovations and give companies a competitive edge. These patents ensure that companies can maintain exclusivity over their new developments, enabling them to stand out by offering unique solutions that meet the increasing demands for sustainability and efficiency. In the construction industry, copyrights play a crucial role in protecting the artistic expression of architectural designs. These rights ensure that original works such as blueprints, drawings, and design documents are only used with proper authorisation, thus fostering a culture of innovation and respect for the creators' intellectual labour.

Know-how and trade secrets are invaluable to construction companies. Practical strategies to protect this non-patentable knowledge from competitors are essential for maintaining a company's unique market advantages. These strategies include implementing stringent security measures and confidentiality agreements that prevent knowledge leakage. IP assets significantly influence investment decisions. A well-managed IP portfolio increases a company's valuation and reduces investment risk, making the company more appealing to potential investors and financial institutions. This attractiveness is due to the perceived lower risk and higher potential returns on investment provided by protected innovations and a strong brand.

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