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BUDGETING AND ARTIFICIAL INTELLIGENCE

ROZPOČTOVANIE A UMEĽÁ INTELIGENCIA

Silvia Ďubek, Marek Ďubek ¹

Silvia Ďubek works as an assistant professor at the Institute of Forensic Science of the Faculty of Civil Engineering at the Slovak University of Technology in Bratislava. In the field of research, she deals with the issue of calculating construction site equipment costs, the design of a construction site equipment cost evaluation model, but also business ethics in construction and pricing. Marek Ďubek works as an associate professor at the Department of Building Technology at the Slovak University of Technology in Bratislava. In his research, he deals with non-destructive testing, pricing and expert evidence.

Silvia Ďubek pôsobí ako odborná asistentka na Ústave súdneho znelectva na Stavebnej fakulte na Slovenskej technickej univerzite v Bratislave. V oblasti výskumu sa venuje problematike kalkulovania nákladov zariadenia staveniska, návrhu modelu hodnotenia nákladov zariadenia staveniska, ale aj podnikateľskej etike v stavebníctve a cenotvorbe. Marek Ďubek pôsobí ako docent na Katedre technológie stavieb na Slovenskej technickej univerzity v Bratislave. Vo svojom výskume sa zaoberá nedeštruktívnemu skúšobníctvu, cenotvorbe a znaleckému dokazovaniu.

Abstract

The present is characterized by a significant expansion of artificial intelligence, which finds application not only in the work and study areas, but also in private life. However, it is always necessary to consider to what extent its outputs can be considered relevant. Artificial intelligence can help in solving common tasks and more complex problems. In this context, the question arises whether it could replace the profession of budgeter in the future. Could it process an itemized budget with hundreds of items based on project documentation in a short time? This is an activity that currently takes budgeters several hours to weeks, depending on the complexity of the project. Therefore, it is appropriate to focus on what artificial intelligence can already effectively process and where its shortcomings are manifested. At the same time, it is possible to consider its further development so that in the future it can serve, for example, as a support tool or control mechanism for budgeters. It could verify the correctness of estimates or point out missing items in the budget, which can have a negligible or significant financial impact.

Key words: artificial intelligence, budget, budgeter

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Abstrakt

Súčasnosť je charakteristická výrazným rozmachom umelej inteligencie, ktorá nachádza uplatnenie nielen v pracovnej a študijnej oblasti, ale aj v súkromnom živote. Vždy je však potrebné zvážiť, do akej miery jej výstupy považovať za relevantné. Umelá inteligencia dokáže pomáhať pri riešení bežných úloh aj zložitejších problémov. V tejto súvislosti sa ponúka otázka, či by v budúcnosti mohla nahradiť profesiu rozpočtára. Dokázala by v krátkom čase spracovať položkový rozpočet so stovkami položiek na základe projektovej dokumentácie? Ide o činnosť, ktorá dnes rozpočtárovi zaberá niekoľko hodín až týždňov v závislosti od náročnosti projektu. Preto je vhodné zamerať sa na to, čo už umelá inteligencia dokáže efektívne spracovať a kde sa prejavujú jej nedostatky. Zároveň je možné uvažovať o jej ďalšom rozvoji tak, aby v budúcnosti slúžila napríklad ako podporný nástroj či kontrolný mechanizmus pre rozpočtára. Mohla by overovať správnosť výmer alebo upozorniť na chýbajúce položky v rozpočte, ktoré môžu mať zanedbateľný, ale aj významný finančný dopad.

Kľúčové slová: umelá inteligencia, rozpočet, rozpočtár

Introduction

Currently, artificial intelligence is virtually unavoidable in any industry that works with data, planning or managing complex processes. Its use is gradually becoming a standard in areas where it is necessary to analyze large volumes of information, optimize decision-making or streamline work procedures. The construction industry, which for many years was considered a sector with a slower pace of innovation and a strong dependence on traditional work methods, is no longer an exception. Recently, however, the construction industry has also been undergoing a significant technological transformation. The introduction of automated processes, the use of extensive databases, digital construction modeling and real-time monitoring of workplaces fundamentally change the way construction projects are prepared, implemented and managed. Modern tools enable more accurate planning, more effective coordination of professions and better control of costs or schedules. Artificial intelligence naturally finds its place in this new digital environment. The development of software solutions, working with data from building information models (BIM), the introduction of digital construction procedures and the growing requirements for work safety on construction sites push the boundaries of technical possibilities. Artificial intelligence can analyze project documentation, evaluate risks, optimize the logistics of materials or identify potential collisions even before the actual construction. This contributes to higher efficiency, reduction of errors and minimization of financial losses. However, with the expansion of these technologies come new challenges. The issue of legal liability in the event of erroneous decisions or incorrect outputs of the system opens up. The key issue remains the quality and reliability of input data, as artificial intelligence is dependent on the accuracy of the information it works with. Technical interoperability between individual software tools and platforms also plays an important role in order to ensure smooth data exchange. Last but not least, it is necessary to pay attention to ethical issues, such as the transparency of algorithms, the protection of sensitive data or the preservation of human supervision over decision-making processes. The future of the construction industry will therefore depend to a large

extent on the ability to balance technological progress with professional control, a legislative framework and a responsible approach to the use of artificial intelligence (AI). (Semancová, 2025)

It is already obvious that artificial intelligence has an indisputable number of advantages such as:

- Greater efficiency and acceleration of work: Automation of repetitive tasks (eg price calculations, administration) allows employees to focus on more creative activities.
- Sustainability and ecology: AI helps optimize material consumption, reduce waste and design energy-efficient buildings.
- Predictive maintenance: After construction is complete, AI analyzes sensor data and predicts the need for repairs before a failure occurs.
- Better supply chain coordination: AI predicts material demand and optimizes logistics, ensuring that materials arrive exactly when they are needed. (Slovensko.ai, 2024)

Many construction companies in Slovakia are already actively implementing elements of artificial intelligence in order to increase efficiency, speed up processes and support innovation in the field of construction preparation and implementation. One example is the company STRABAG, which systematically integrates modern digital technologies into its work procedures. One of the technologies used is generative design (GD), which finds application especially in the design of buildings. Through GD, designers can analyse and evaluate many design variants in a short time. The system can automatically generate hundreds of solutions that are continuously optimized according to the set goals and technical or construction requirements of the project. Such an approach makes it possible to identify innovative and effective designs that might go unnoticed in traditional, manual design. Subsequently, the most suitable variant is selected, which is further adjusted so that it best meets the specific requirements of the investor and the project. An important innovative element is also 3D printing of concrete, which it uses as a modern construction method. This technology brings construction acceleration and the potential to reduce costs, while at the same time enabling the realization of precise and shape-complex constructions. The advantage is also more efficient use of materials and minimization of waste. The integration of artificial intelligence into the 3D printing process contributes to the optimization of the printing process itself, increases its speed and enables the more efficient use of recycled materials, thus supporting sustainability in the construction industry. Another concrete example of the use of artificial intelligence is the DARIA tool (Data-driven Risk Analysis), i.e. data-driven risk analysis developed specifically for the field of road construction. It is a digital solution that helps to identify potential financial risks already in the initial stages of the project. DARIA enables controllers and project managers to create more objective cost development forecasts and to react to possible deviations in a timely manner. In this way, it significantly contributes to higher transparency, better quality control and more effective management of financial risks within construction projects. (STRABAG, 2025)

Budgeting in construction

If we are considering the use of artificial intelligence in the creation or control of the budget, i.e. the bill of quantities, it is essential that all the requirements that apply to this process are

met. These are not only legislative, but also normative and professional requirements that determine the correctness, completeness and transparency of budget processing. The basic goal of every budget must be a clear and demonstrable result - setting the price for the work. It is the price that represents the key output of the entire process, and therefore must be supported by accurate dimensions, correctly classified items and relevant documents. If artificial intelligence is to be of benefit in this area, it must respect all these criteria and ensure that the resulting budget meets the required professional and legal standards.

The price is the monetary amount agreed upon when buying and selling goods. A price agreement is an agreement as to the amount of the price or an agreement as to the manner in which the price will be established, provided that the manner sufficiently determines the price. When negotiating the price, the binding definition of the goods is the name, possibly also the numerical code of the customs tariff or the numerical code according to a special regulation, the unit of quantity, quality and delivery conditions or other conditions agreed upon by agreement of the parties. (Law no. 18/1996 Coll. about prices)

The measurement statement is a detailed description of the construction object, including items of construction work, assembly work and supplies of building materials. This description contains units of measurement and quantity calculation, with the aim of providing a clear idea of the future construction work for both parties – the investor and the contractor. (Ellingerová, 2013)

The budget would form an annex to the contract for the work and would define in it what is to be realized specifically, from what material, in what quantity and at what price. (Ellingerová, 2013). The most important function of the measurement report is to describe the construction object so that both parties, both the investor and the contractor, have the same idea about the future construction work. The measurement report is used to document the physical extent (measurement) of each budget item. This is the actual calculation of the amount specified for individual budget items. That is, not only to indicate the total area of the given budget item, but also to document its calculation. The order of items in the statement of measurements corresponds to the order of items in the budget. (Čavojský & Ellingerová, 2021).

The classification of items in the budget is done using the Classification of Construction Works and Constructions (TSKP) or the Classification of Construction Works (TSP). TSKP is mostly used in practice, even if this classification is not currently valid. (Ellingerová, 2007)

Budget and artificial intelligence

It is not new that artificial intelligence can create a price offer based on input data. However, such outputs usually do not have a sufficient level of detail, especially when it comes to the detailed breakdown of individual items and their exact valuation. In the field of construction, price offers are usually generated broken down according to the main stages of construction, without detailed processing of the statement of dimensions at the level of individual constructions or work operations. However, the budget as a professional document must meet precisely defined formal and content requirements in order to be transparent, controllable and in accordance with valid legislation and standards. It is important to have a clear structure,

correct classification of items, indication of measurement units, dimensions, unit prices and total costs. Compliance with these requirements represents a certain challenge for current artificial intelligence systems, especially if output is expected in a standardized form corresponding to professional and contractual requirements.

Currently, there are several artificial intelligence tools through which these tasks can be processed at different levels of quality and accuracy. However, a significant difference lies in whether these are free versions of tools with limited functions and capacities, or professional paid solutions that offer more advanced algorithms, wider integration options and a higher degree of adaptation to the specific requirements of professional practice.

The free version of Google Gemini and the paid version of ChatGPT were used to verify the capabilities of artificial intelligence. Both systems were assigned an identical task – to develop a budget for a family house and a detached garage, while the project documentation was provided in PDF format. After processing the assignment, both tools requested additional information needed to prepare the budget. It was mainly about the specification of the construction system of the object, the determination of the scope of implementation (e.g. Shell house or turnkey execution) and the required level of detail of the budget - is it sufficient to determine the total price or is it necessary to process it by individual stages of construction with detailed pricing. At the same time, the assignment was based on the requirement to divide the budget according to the classification of construction structures and works (TSKP), i.e. with a breakdown of specific items in accordance with the commonly used structure in construction practice.

After entering all the necessary information, Chatgpt said: "Delivery: within 48-72 hours as agreed. When it is done, I will send you a complete package of prepared documents." For more than 72 hours, it was determined whether it was ready and whether it had what we requested.

And the answer was: "No, it's not yet "done" in the sense of a complete 300-item TSKP Excel, because I can't work here in the chat for 48-72 hours in the background and then deliver the finished file as an external budgeter.

In this environment I know:

- ✓ make a detailed structured budget here in the chat
- ✓ create a real XLSX file (TSKP structure + recap + stages)
- ✓ make a measurement report in tabular form
- ⚠ but not to carry out full-fledged professional measurement of drawings like CENKROS / ODIS budget software.

It was only at this stage that the ChatGPT tool explicitly stated that it could not prepare a full-fledged budget in the required scope and quality so that it could be directly used in professional practice, for example as a basis for a bank when financing a building with a mortgage loan.

Subsequently, an attempt was made to find out to what extent he is able to fulfill the request, specifically by creating an Excel file in the TSKP structure, including a measurement report. This step was only partially fulfilled. Although the system generated an Excel file and

tried to break it down according to the TSKP, the result did not correspond to a full-fledged itemized budget with all relevant items that should be part of the document.

At the same time, specific dimensions of individual items were absent in the output. The only explicitly stated data was the measurement of the roof area, which was directly stated in the drawing documentation. However, the other dimensions were not derived from the project documents or added up, which significantly limits the practical usability of the budget processed in this way. (Fig. 1).

BUDGET (CENKROS-like structure)											
Project FAMILY HOUSE AND GARAGE											
Client: Private investor											
LocaticSvaty Jur											
VariantSHELL (excl. VAT) + TURNKEY (excl. VAT)											
Note: No utility connections, no paved areas, no terrace. ETICS 200mm, Porotherm, RC slab, heat pump + UFH.											
TSKP	Section	Item code	Item description	Unit	Quantity	Unit price - material	Unit price - labor	Unit price - equipment	Unit price - total	Total cost	Variant
001	Earthworks	001-001	Topsoil stripping up to 0.30 m, haul/disposal	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
001	Earthworks	001-002	Excavation of strip foundations in soil class 3-4	m3	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
001	Earthworks	001-003	Backfilling and compaction in layers	m3	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
002	Foundations	002-001	Concrete strip foundations C16/20 (supply & placing)	m3	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
002	Foundations	002-002	Foundation reinforcement (rebar & tying)	kg	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
002	Foundations	002-003	RC foundation slab (concrete + reinforcement + works)	m3	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
002	Foundations	002-004	Waterproofing + radon barrier	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
003	Vertical structures	003-001	External masonry Porotherm 300 mm	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
003	Vertical structures	003-002	Internal load-bearing masonry 250 mm	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
003	Vertical structures	003-003	Partitions 100-150 mm	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
004	Horizontal structures	004-001	Cast-in-place RC floor slab (concrete, rebar, formwork)	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
005	Roofs	005-001	Carpentry works – roof timber structure	m3	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
005	Roofs	005-002	Ceramic roof tiles (supply & installation)	m2	186,00	0,00	0,00	0,00	0,00	0,00	SHELL
005	Roofs	005-003	Sheet metal works (flashings, gutters)	kpl	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
006	Finishes	006-001	Internal plaster (lime-cement)	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
006	Finishes	006-002	ETICS 200 mm + finishing render	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
007	Floors	007-001	Floor thermal insulation EPS 150S	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
007	Floors	007-002	Cement screeds	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
008	Openings (windows/doors)	008-001	PVC windows triple glazing (supply & install)	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
008	Openings (windows/doors)	008-002	Entrance door	ks	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
008	Openings (windows/doors)	008-003	Sectional garage door (automatic)	ks	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
010	Plumbing (water & sewer)	010-001	Internal water & sewer distribution	kpl	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
011	Electrical	011-001	Electrical installation (outlets, wiring, distribution board)	kpl	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
012	Heating	012-001	Air-to-water heat pump + installation	kpl	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
012	Heating	012-002	Underfloor heating (pipes, manifolds)	m2	1,00	0,00	0,00	0,00	0,00	0,00	SHELL
900	Final works	900-001	Floor finishes (laminat + tiles) – supply & install	m2	1,00	0,00	0,00	0,00	0,00	0,00	TURNKEY
900	Final works	900-002	Bathroom wall tiling – supply & install	m2	1,00	0,00	0,00	0,00	0,00	0,00	TURNKEY
900	Final works	900-003	Sanitary ware set (2 bathrooms + WC) – supply & install	kpl	1,00	0,00	0,00	0,00	0,00	0,00	TURNKEY
900	Final works	900-004	Internal doors + frames	ks	1,00	0,00	0,00	0,00	0,00	0,00	TURNKEY
900	Final works	900-005	Painting (2 coats, white)	m2	1,00	0,00	0,00	0,00	0,00	0,00	TURNKEY

Fig. 1 – Generated budget according to chatgpt

Source: Chatgpt

The free version of the Google Gemini tool responded quite unambiguously when the request itself was entered. She stated that she is currently unable to independently generate a complete and legally applicable itemized budget (measurement statement), which could be submitted to a bank or construction company as a contract annex. As the reason, she cited the need for specialized budgeting software (eg CENKROS or ODIS), which works with current databases of material and work prices, regularly updated depending on market developments. Despite this limitation, the tool offered alternative possibilities of use (Fig. 2). It has declared the ability to help with an indicative budget, the structure of a measurement statement or with a methodical procedure for calculating costs, provided that specific input data such as areas,

lengths or volumes of individual structures are entered. At the same time, he stated that in the case of the existing budget processed by the designer, he is able to supplement or modify the price data. From the above, it follows that the free version of the tool reflects its limits in the field of professional budgeting, but at the same time it offers supporting functions that can be used for indicative calculations or as an auxiliary analytical tool.

What I can do for you (and very effectively):

1. Structure and "Blank Bill of Quantities"

If you provide the basic parameters from your project (foundation area, exterior wall area in m^2 , roof area, number of windows), I can create a detailed structure of all the sections you shouldn't overlook. This will serve as an excellent baseline for comparing quotes from different contractors.

2. Cost Estimation (Expert Estimate)

Based on current 2026 market prices, I can calculate approximate costs for individual stages:

- **Foundation Slab:** Excavation work, concrete, reinforcement.
- **Rough Construction:** Masonry, lintels, ceilings, ring beams.
- **Roof:** Trusses, roofing material, flashing/tinwork.
- **Installations:** Electrical, water, gas, heating.
- **Finishing Works:** Floor screeds, plastering, thermal insulation.

3. Bill of Quantities Analysis

If you already have a "Bill of Quantities" from your designer (a list of materials without prices), you can copy it here or upload it. I will calculate the real market prices for it so you can verify if a construction company isn't overcharging you.

Fig. 2 – Generated offer according to Google Gemini
Source: Google Gemini

Subsequently, the Google Gemini tool was asked whether it is able to identify and derive individual dimensions, such as areas, lengths and volumes of structures, from the project drawing documentation. In his answer, he specified which types of data he can read from the drawings, pointed out his limitations, and at the same time indicated what input information needs to be added by the user in order to achieve a more accurate result (Fig. 3).

To verify its practical possibilities, he was subsequently assigned the task of developing an indicative budget for the rough construction based on the available drawings. The output was a budget that primarily focused on material items clearly identifiable from the project documentation.

However, several items related to the implementation of works were absent from the budget, especially those that do not involve the direct incorporation of load-bearing material (e.g. assembly, auxiliary and technological works). Although an attempt at structuring according to TSKP was indicated in the output, the division was not complete or systematically processed. At the same time, the tool proposed indicative unit prices for materials and works, which it declared as roughly corresponding to market conditions in the given period (Table 1).

Prices: Used average market prices for the year 2024/2025 in Slovakia (material + labour). If you build with your own hands, you can deduct approximately 30-40% from the price of the work.

Reserve: I recommend adding a 10% reserve to the budget for unforeseen costs (landfill, transport, small consumables).

Opening fillings: Windows and doors are not included in this table (they usually form a separate item approx. €10,000 - €15,000 depending on the profiles).

Garage: The budget considers the house and the adjacent garage as one whole according to the floor plan.

Gemini said:

I can extract and analyze data directly from images or PDF drawings, but I must be honest with you to avoid errors on the construction site: at this stage, AI cannot replace the work of a quantity surveyor with millimeter precision.

Here is an exact description of what I can do for you at this moment and where my limits lie:

What I can process:

- **Dimension extraction:** If you upload a floor plan or cross-section, I can read the indicated dimensions (e.g., wall lengths, insulation thickness, ridge height).
- **Mathematical calculations:** If the data on the drawing is clear, I can calculate:
 - **Areas (m^2):** Floor area, facade area for insulation, or roof area.
 - **Volumes (m^3):** Volume of concrete for foundation strips or the amount of masonry (if you provide the wall thickness and height from the legend).
- **Logic check:** I can verify if the sum of the individual room areas matches the total usable area stated in the project.

What to watch out for (My limits):

- **Missing scales:** If the drawing is not fully dimensioned and I have to "measure with a ruler" from the image, significant deviations may occur due to distortion from photographing or scanning.
- **Complex details:** I cannot automatically subtract the volume of reinforcement (rebar) from concrete or accurately determine the waste factor for roof tiles just by looking at a drawing.
- **Construction layers:** If there is no table of structural layers (composition) attached to the drawing, I cannot "guess" how many layers of insulation go into the floor.

Fig. 3 – Generated offer according to Google Gemini
Source: Google Gemini

Section Code	Item Description (TSKP)	Unit	Est. Quantity	Unit Price (€)	Total (€)
1	EARTHWORKS				3,850
122 20	Excavation and soil stripping (0.3m topsoil removal)	m3	85	10	850
132 20	Trench excavation for foundations (width up to 2m)	m3	120	25	3,000
2	FOUNDATIONS				11,250
271 57	Foundation cushions (gravel bed, fraction 16-22 mm)	m3	25	45	1,125
274 31	Concrete for foundation strips (plain concrete C16/20)	m3	45	110	4,950
273 32	Concrete for foundation slabs (reinforced concrete C25/30)	m3	42	125	5,175
3	VERTICAL STRUCTURES				16,400
311 27	Load-bearing masonry (300 mm thick - e.g., Heluz/Porotherm)	m2	225	55	12,375
342 27	Partition walls (100 - 150 mm thick)	m2	115	35	4,025
4	HORIZONTAL STRUCTURES				9,800
411 32	Ground floor ceiling slab (RC slab, 150 mm thick)	m3	18	320	5,760
417 32	Reinforced concrete ring beams and lintels	m3	12	340	4,040
6	SURFACE FINISHES (Basic)				11,400
622 41	External wall insulation (EPS 200 mm + mesh/armouring)	m2	215	40	8,600
612 42	Internal wall plastering	m2	400	7	2,800
7	ASSOCIATED CONSTRUCTION SERVICES				22,300
711	Waterproofing (bitumen sheets, 2 layers)	m2	135	12	1,620
713	Thermal insulation of floors (EPS 150, 170 mm thick)	m2	111	22	2,442
762	Carpentry structures (Roof truss - timber + assembly)	m2	186	65	12,090
765	Hard roofing (Roof tiles including accessories)	m2	186	33	6,138
TOTAL	ESTIMATED ROUGH CONSTRUCTION COST				75,000 €

Table 1 – Generated budget according to Google Gemini

Source: Google Gemini

Evaluation

The article addresses the current issue of implementing artificial intelligence in the construction industry, with particular emphasis on its application in cost estimation and bill of quantities preparation. It appropriately situates the topic within the broader context of digital transformation in construction, where AI is increasingly becoming part of planning, design, and risk management processes.

A significant strength of the paper lies in its practical verification of selected AI tools (the free version of Google Gemini and the paid version of ChatGPT) in preparing a construction budget based on project documentation. This experimental approach enhances the value of the study by providing practical insights rather than remaining purely theoretical. The findings indicate that current AI tools can generate indicative cost estimates, structuring budgets according to basic classification systems (e.g., TSKP), and can generate. However, they are not yet able to independently produce a comprehensive, detailed, and legally applicable bill of quantities suitable for contractual or financial purposes. The main limitations were identified in the accurate extraction of quantities from drawings, the completeness of cost items, and the omission of certain technological and labor-related processes not explicitly visible in project documentation. The article therefore objectively

identifies the current limitations of AI in professional cost estimation while also highlighting its potential as a supportive analytical and control tool.

Conclusion

Based on the conducted analysis, it can be concluded that artificial intelligence is currently not capable of fully replacing the professional work of a construction cost estimator. Although AI can process textual and partially graphical inputs, generate structured outputs, and provide indicative pricing, its results do not yet meet the standards required for a detailed and legally reliable bill of quantities. The most significant limitations relate to the precise determination of quantities, the comprehensive inclusion of all construction and technological processes, and the use of up-to-date market pricing data. These aspects still require professional expertise and responsibility. Nevertheless, AI represents a promising supportive tool with considerable development potential. It may serve as an analytical assistant or control mechanism to improve efficiency and transparency in cost estimation processes. The current stage of development also presents an opportunity to address these challenges through research grants and applied projects aimed at integrating artificial intelligence with BIM models and professional cost databases, thereby advancing its practical applicability in the construction industry.

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