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AI IN BUILDING PROJECTS

Artificial Intelligence (AI) is revolutionizing various industries, including construction. By leveraging AI technologies, construction companies can enhance efficiency, improve safety, reduce costs, and optimize project management. Here are some key points about the use of AI in building projects:

1. Reducing Costs and Enhancing Efficiency. Robotics, AI, and the Internet of Things can reduce building costs by up to 20 percent. Engineers can use virtual reality goggles and mini-robots to track the progress of construction, plan the routing of electrical and plumbing systems, and develop safety systems for worksites. [1]

AI is used to track real-time interactions of workers, machinery, and objects on the site, alerting supervisors of potential safety issues, construction errors, and productivity issues. [1]

AI is expected to optimize energy efficiency, water supply, indoor air quality, and other performance metrics in building projects, leading to enhanced efficiency and cost savings. [2]

2. Improving Safety. AI is being used to develop safety systems for construction sites. It can track real-time interactions between workers, machinery, and objects on the site and alert supervisors of potential safety issues. By identifying construction errors and potential hazards, AI can help reduce worksite injuries and improve overall safety. [2]

3. Post-Construction Management. AI can be used long after construction is complete. Building managers can utilize AI to collect and analyze data, optimize energy efficiency, monitor indoor air quality, and improve overall performance metrics. By leveraging AI in post-construction management, building owners can enhance the operational efficiency of their facilities. [1]

4. Building Information Modeling (BIM). BIM, when combined with AI, has the potential to create new value in the construction industry. AI can automate various BIM procedures, including design and rule checking, 3D as-built reconstruction, event log mining, building performance analysis, and virtual and augmented reality. By streamlining and automating these processes, AI can enhance the management of complex construction projects. [3]

5. Predictive Maintenance. AI can analyze data from building systems to predict maintenance needs. By identifying potential issues before they occur, AI can help prevent costly breakdowns and improve the overall maintenance process. [4]

6. Optimizing Decision-Making. AI can assist in decision-making processes, such as project scope assessment, bidding strategies, and building code compliance validation. By automating repetitive tasks and analyzing data, AI can streamline processes and improve the speed and accuracy of decision-making. [4]

It's important to note that while AI is transforming the construction industry, it is unlikely to replace the human workforce. Instead, AI will augment human capabilities, improve efficiency, and enable new business models in the construction industry.

In conclusion, AI is revolutionizing the construction industry by reducing costs, improving safety, optimizing project management, and enhancing post-construction operations. By leveraging AI technologies, construction companies can benefit from increased efficiency, improved decision-making, and enhanced overall performance.

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SAFETY AND INNOVATION. CONTRADICTIONS IN THE IMPLEMENTATION OF NEW TECHNOLOGIES

Over the past fifteen years, it is known that the number of inventors and rationalizers in Ukraine has steadily decreased, and the scientific potential of our country has declined. Enterprises, institutions, and organizations are not fully conducting patent research as stipulated by state standards; societal and state needs for such production are not being studied. The number of enterprises implementing innovative products is consistently decreasing [1-5].

The pace of development, structure, and material support of the research and development sector do not meet the needs of ensuring the National Security and economic independence of Ukraine, nor do they meet the increasing demand for advanced technologies from various segments of the entrepreneurial and state sectors of the economy.

The domestically proposed research sector developments and certain scientific outcomes, even those of international standards, do not find application in the Ukrainian economy due to the imbalance in the national innovation system, 'irrational behavior of the leadership of certain enterprises,' 'unfair competition,' morally and conceptually outdated regulatory framework, and low receptivity to innovations in the entrepreneurial sector of the economy

The raw material model of Ukraine's economy [5], which relied on competitive advantages of cheap labor and low-cost energy resources, has exhausted itself and led to our failure to increase economic potential and undergo technological transformations. This chain of events significantly lowered the international rankings of our state.

According to reports from the Bloomberg agency (Bloomberg Innovation Index) [6], in the last 15 years, our country has not ascended beyond the 43rd position. In the World Economic Global Competitiveness Index 2008-2022 [3], Ukraine has not risen above the 57th position.

According to The Global Competitiveness Index 2023, among 132 countries worldwide, Ukraine ranked as follows in various categories:

- research and Development - 57th position;
- level of patenting developments - 29th position;
- level of innovation-related financing - 125th position;
- level of investment inflow - 107th position;
- capital turnover volume of joint ventures - 122nd position;