Journel of AI and Machine Learning
Volume 1, Issue 1

# The Influence of Cultural Perceptions on the Adoption of Artificial Intelligence (AI) in the Construction Industry

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**Abstract**

This review determined how culture influences the adoption of Artificial Intelligence (AI) in construction, specifically in developing regions. The review is mainly based on three research questions, including the significance of AI in the construction industry, factors affecting the adaptation of AI, and strategies to overcome AI resistance. It stressed that culture plays a vital role in AI adoption by impacting decision-making and workforce readiness. The review analyzed previous studies assessing the application of AI in construction and concludes that cultural resistance is a major factor hindering technology implementation. It outlined influence factors, namely risk aversion, traditional approaches, and organizational structure, that fuel cultural resistance to adopting AI. The review highlighted that creating organizational cultures that are more receptive to innovation, increasing employees' engagement, improving tech-skill training, and developing leadership are the ways to overcome the cultural resistance to AI adaptation. Moreover, this review encouraged the development of AI adoption frameworks according to regions and future investigations on the impact of leadership positions and interprofessional relations in AI adaptation. This review contributed to enhancing the process of AI adaptation in the construction industry by identifying cultural resistance factors and providing strategies to deal with them.

**Keywords:** Artificial Intelligence, Construction Industry, Cultural Influence, Risk-Averse

## 1. Introduction

The construction industry is an essential growth driver for developing economies worldwide. Recent developments in construction show a major transformation resulting from integrating Artificial Intelligence (AI) computational systems [1]. These technological tools have revolutionized the decisions made within the construction sector by supplying construction experts with sophisticated decision-assistance systems that demonstrate intelligent processing functions [2].

The construction industry annually produces values above $10 trillion globally. Research shows that construction projects usually face 80 % cost overruns, which have major financial consequences [3]. The construction industry presents slow productivity development when measured against other sectors since it achieved increased performance by 1 % throughout the past twenty years [4]. Current statistics raise serious worries about the need for new methods to enhance decision-making processes while addressing widespread inefficiencies in construction operations [5].

AI Algorithms help construction experts use data to make better decisions while doing their jobs. The methodology integrates historical, current, and predictive models to deliver accurate solutions and recommendations (Yuan and Zhu, 2023). Project managers can use AI Intelligent Decision Support Systems (IDSS) to optimize outcomes and cut costs while increasing production through automated task execution, optimized resource deployment, and risk detection. Construction engineering fundamentally benefits from AI methodology because it allows complex data analyses that produce meaningful patterns and insights [6]. Traditional decision-making activities that rely significantly on human interventions are sensitive to human factors and subjective judgments and aware of inconsistencies in decision-making. Consequently, AI

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Received: March-14-2025 Revised: March-14-2025 Accepted: March-14-2025

algorithms can consider enormous data of both structured and unstructured forms to reveal patterns that cause precise projections [7]. These technologies expand the construction professionals' thinking skills to effectively utilize data-oriented decision-making [8].

Culture plays a critical role in the extent to which the construction industry adopts AI systems. This makes this area relevant since the field deals with a persistent operating deficit problem and requires a technological shift. AI potential benefits and risks are perceived differently depending on technology-related cultural perceptions, which define attitudes toward technological change amongst the stakeholders [9]. In the area where change resistance increases towards new methods, AI optimization strategies have issues combining with the basic core practices [10]. The consideration of cultural differences is, therefore, a fundamental necessity for the modeling of strategies that enhance the uptake of AI since emerging markets depend on construction for growth. To unlock the optimum potential of AI for improving construction practices, the respective organizations in the construction industry need to pay attention to cultural differences because the goal is to attain better results through AI [11].

Past works lack research on how culture influences the implementation of AI in construction. Prior research identifies technical and financial challenges as the factors hindering the adoption of AI by overlooking cultural factors that define the perception of the stakeholders [11-13]. The previous studies lack adequate analysis of regional and organizational cultural factors that shape AI integration approaches among developing economies alongside traditional practices in the construction industry [14-17]. Integrating AI into the construction industry requires fulfilling these knowledge gaps, directly impacting the creation of productivity-enhancing and adoption-facilitation strategies.

The review explored cultural influence impacting AI integration in construction to generate targeted strategic approaches for various contexts. This review sheds light on cultural factors that improve AI decision-making efficacy and productivity growth, specifically within developing economies in construction industries. Thus, this review determined the following research questions:

RQ1: What is the significance of culture perception in adopting AI in the construction industry?

RQ2: What cultural factors perception impact the adoption of AI throughout the construction industry?

RQ3: What are the strategies to overcome AI resistance in the construction industry?

## 2. Background

### 2.1. AI Adaptation in Construction Industry

The construction sector now embraces AI rapidly as this technology revolutionizes basic practices and enhances production quality, safety protocols, and operational decision processes. Merdžanović et al. (2023) have shown that AI optimizes project planning by applying predictive analytics to historical data to predict resource requirements and delays so schedule management becomes more efficient and costs decrease [18]. AI tools like machine learning and computer vision enable real-time site hazard reduction through safety management and site logistics planning [19]. When AI technology integrates with operations, it automates processes effectively and establishes an innovative culture across the industry to unlock smarter building techniques [20].

The constant integration of AI across all industries has entrenched itself as a uniquely twenty-first-century phenomenon. AI is the computer science and engineering area that deals with designing, constructing, and implementing systems, programs, and computer algorithms capable of solving problems by emulating human intelligence [21, 22]. Over time, as these technologies continue to evolve and increase sophistication, they offer unprecedented opportunities to revolutionize how the construction sector addresses complex issues. AI technologies continuously improve the construction industry with efficiency, safety, and project management [23-25]. One example of its usage is the application of predictive analytics, which uses past data and analytical tools to predict potential project setbacks, material scarcities, and rising costs [26]. Another important field is self-driven construction equipment, including bulldozers and excavators with less manpower involvement, specifically in excavation and grading work [27].

Technical systems that involve computational visioning help in real-time surveillance where construction sites are involved to ensure no risk incidents [28]. In addition, natural language processing and chatbots enhance work coordination and interactions among the project stakeholders by reducing misunderstandings and corresponding delays [29]. AI technologies generally revolutionize the construction industry by enhancing operations, managing risks, and bringing efficiency,

effectiveness, and affordability to construction sites [30-32].

AI usage within the construction sector emerges as an answer for dealing with multiple industry challenges, including budget overruns, scheduling delays, and worker safety issues [33]. Integrating new technology into organizations remains essential because it creates effective solutions that drive measurable project benefits [19]. A proposed framework by de Aquino Leite Gomes (2025) guides construction contractors by providing a structured progression from readiness assessment to complete deployment. The model bridges the imaginary usage potential of AI systems with the actual deployment possibilities in construction site environments. The AI framework, as shown in Figure 1, contains these essential steps: Assess Readiness; Identify Use Cases; Build a Data Strategy; Select AI Tools; Develop a Pilot Project; Train the Workforce; Monitor and Iterate; and Scale and Sustain.

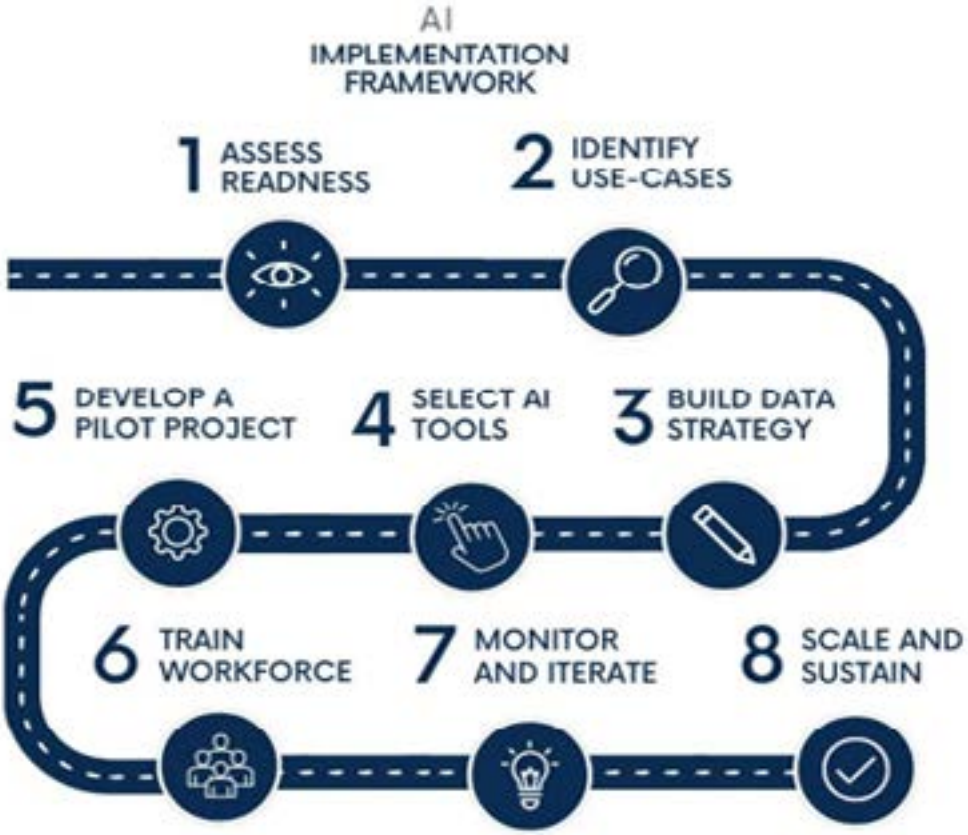


*Figure 1: AI Implementation Framework [34]*

AI integration in the construction industry is a strategic response to the continuous demand for skills within the labor market and the industry's management deficiencies. Intelligent systems study the workforce's competencies to identify shortcomings and define improvement steps that enhance the faculties of the workforce [35]. The construction sector continues to embrace digital changes; hence, there is a need to eradicate cultural barriers that hinder the use of AI. Culture is important when developing actionable frameworks for easing the implementation of AI technologies while simultaneously seeking to optimize usage across various cultural regions [9]. With the advanced implementation of AI in construction, enhanced production will align with sustainable practices that achieve United Nation's sustainable development goals.

2.2.Cultural Perceptions and Technology Adoption in Construction Industry

Project stakeholders' impression and success regarding technology's benefits and risks in construction depend on the understanding of cultural values. Na and colleagues confirm that cultural differences between nations contribute greatly to accepting technology trends using the example of South Korea and the United Kingdom. While South Korean adopters use the perceived ease of use based on personal

competence, British users believe in the usefulness aspect for acceptance [11].

Also, the Japanese construction industry has combined collective decision-making with team harmony to illustrate the slow uptake of disruptive technologies like AI. The strong organizational commitment to long-term partnerships concerning group unanimity tends to slow the Japanese embrace of new technologies and, subsequently, the deployment of such technologies [36]. On the other hand, German construction firms incorporate AI solutions owing to the increased productivity and decreased costs in line with German construction companies' structured methodology and innovative nature [37].

The inclusion of technology in construction projects is, however, accompanied by numerous barriers that have social and organizational roots. The construction industry experiences little innovation advancement because it is resistant to change and mainly consists of traditional practices [38]. According to Zhang et al. (2024), Construction companies also embrace risk-averse behavioral strategies and centralized decision-making through group decisions, with less inclination toward innovative, fresh technologies [39]. Olawumi and Oladapo (2025) point out that the framework for implementing technology adoption strategies should consider certain aspects of culture within the methodology structures. [40]. Construction organizations can enhance the production readiness regarding AI and advanced technologies through cultural perception analysis and innovation-cultivating settings, enhancing operational efficiency and superior project outcomes.

## 3. Significance of Cultural Perception on Adopting AI in the Construction Industry

Culture affects how markets integrate AI in construction and other industries. One of the reasons for the slow pace of embracing IT in the construction industry is that it uses traditional practices to build structures and has a rigid organizational management structure [11]. As per Tubadji et al. (2021), AI demonstrates established technical and economic advantages, but its rate and success in implementation depend heavily on stakeholders' cultural views regarding technology adoption. Organizational practices accept and integrate technology differently because of cultural factors during AI adoption processes. Few cultural environments reject AI technology adoption because they focus on risk reduction and preserving present operational frameworks [41]. Organizations operating within innovative cultures show increased AI adoption because they recognize technology as a means to drive efficiency and rectify ongoing industrial problems [42].

Current research demonstrated that cultural beliefs shape how industry executives evaluate AI systems during decision-making processes. According to Chan (2024), construction companies prioritizing collective decision-making and harmonious values tend to resist implementing AI technologies because they fear AI will break down(collaborative) workplace dynamics. Concerns about AI technologies arise because their adoption threatens long-standing team dynamics that oppose autonomous machine decision-making and potentially disrupt consensus-based culture [43]. On the other hand, as per Alhasan & Alawadhi (2024), construction companies promoting technological advancement encourage the integration of AI through employee training and support, and such companies believe that AI integration relates to efficiency enhancement and cost reduction [44].

Various research shows that culture plays an essential role during the deployment of AI in construction projects. Flores Lara et al. (2025) state that integrating AI technologies faces major implementation delays because of traditional cultural resistance within various economic systems [16]. According to Pagliero et al. 2024 for successful AI adoption, the team needs both specialized technical skills and cultural sensitivity, which enables them to adapt communication to match workplace practices and cultural norms [45]. As a whole, the recognition of cultural factors helps construction experts develop supportive strategies that increase acceptance levels of AI technology in construction innovation.

## 4. Cultural Factors Influence AI Adoption Perception in the Construction Industry

Culture plays a large role in the implementation of AI in construction. Such perceptions form the basis for how well construction operations accept or adapt to and integrate AI solutions. Technology adoption is more likely to succeed in cultural contexts as innovation is an efficiency-enhancing tool [11]. In Japanese construction companies, through adapting their business philosophy, Kaizen introduces AI solutions as these companies have a strong belief in technology and constant improvement. There is cultural acceptance among the Japanese staff members to participate in new technologies, hence

improving the implementation of AI tools [46]. Further, it is identified that the extent and nature of AI applied in the construction industry are connected to how risk is perceived across cultures. Business entities that execute their operations in the conservative risk context avoid adopting AI systems because their team members fear that the systems will fail and the processes will change. According to the findings presented by Alaboud and Alshahrani (2023) noted that Middle Eastern countries with strong traditional construction practices are wary of using AI technologies for construction because they are uncertain about AI outcomes and the reliability of the systems [47]. Reluctant risk-takers do not consider AI solutions because they prefer traditional approaches over implementing new technologies during integration [48].

According to Ghimire et al. (2023), integration issues of construction projects might be due to differences in work culture that make work teamwork and Interpersonal communication patterns. Some Asian cultural environments prioritize seniority-based respect, so they centralize their decision-making procedures, which reduces opportunities for less experienced staff to leverage productively from AI information [49]. Therefore, AI systems that attempt to foster collaborative engagement between multiple workgroups will likely encounter high levels of organizational culture resistance regarding adopting novel, open communication paradigms [50]. Also, cultural society-enhanced training and skill development activities in the organization significantly guarantee the adaptation of AI. Skill development and training propels AI adoption in cultural society more than anything else. Companies with good employee support to carry on the learning process prefer training to help their staff utilize AI technology effectively. Scandinavian regions prioritize professional education and skill development, producing workers who easily implement AI construction solutions [51]. As per Cramarenco et al (2023)

Cultures with weaker ongoing training traditions frequently lead employees to resist new technologies and delay AI adoption, so the organization struggles with implementing AI solutions [52].

## 5. Strategies to Overcome AI Resistance in the Construction Industry

Several strategic approaches help organizations recognize and solve cultural and operational barriers to AI adoption in the construction sector. According to Malik et al. (2021), Establishing a culture of innovation is required to implement AI in construction companies successfully. Companies should initiate campaigns by using educational seminars on the benefits of integrating AI in construction and seminars showcasing the efficient application of AI in various construction projects. Discussions on AI as a means of presenting capabilities that would enhance/ optimize work performance, reduce costs, and enhance workplace safety could motivate stakeholders to embrace AI systems [53].

In their research, Dong et al. (2025) mentioned that employee inclusion during AI implementation minimizes resistance. When workers participate in decision-making at all organizational levels and help integrate AI systems, they develop ownership, which minimizes their concerns about AI implementation. Participatory approaches foster the workforce's trust while obtaining a feasible solution [54]. In addition, organizations must portray how AI enshrines repetitive tasks to provide workers with time to focus on creative and innovative activities. Construction companies that assure employees about their value in AI environments have improved attitudes toward technology acceptance [51].

Sunny et al. (2019) have highlighted the importance of teamwork in emerging AI. In their opinion, organizations that secure intercultural collaboration improve how their employee responds to AI technological advances. According to them, different groups of personnel of various cultural backgrounds should create AI implementation goals to be integrated into the organizational structure. It fosters the sharing of knowledge, yet it offers multiple perspectives in using technology applications [55]. Organizations achieve better results using diverse team performance to establish an atmosphere where employees feel valued and empowered to support AI projects. Organizations gain better willingness from team members to participate by involving them through planned engagement. This approach lessens resistance that naturally emerges when hierarchical systems exclude parts of the workforce [56].

Cramarenco et al. (2023) mentioned that implementing a growth mindset in a business structure is vital for pushing past employee opposition to AI deployment in the construction industry, which usually follows traditional approaches. Within a growth mindset set, team members transform difficulties into platforms for educational development instead of hindrances [52]. The development of growth mindsets among employees can happen through

organizational support of continuous educational programs instructing innovation techniques and flexible adaptation skills for technological transformations [57]. Creating an experimental and failure-learning supportive organization culture aids fear reduction about AI deployment and employee acceptance of new systems as work advancement tools [58].

## 6. Conclusion

### 6.1. Summary of Key Points

This review highlighted cultural perceptions as one of the most significant factors affecting the adoption of AI in the construction industry. It is realized that the application of AI offers tremendous potential benefits in terms of productivity, safety, and cost savings. Nonetheless, the application of AI cannot be generalized because of differences in cultures across the globe. Several firms and industries are still reluctant to implement AI, especially those operating in a conservative environment, while only modern-thinking economies harness AI as one of the most effective tools that help solve complex business issues. As per the review, AI adoption is constrained by traditional practices coupled with risk-averse attitudes across conservative economies. Conversely, AI is adopted across more innovative economic cultures due to enhanced efficiency and problem-solving capabilities. The review also revealed that organizational culture, particularly decision-making on an organization-wide level, behaviors that resist change, and centralized control are very influential in AI deployment. This review highlighted that it is crucial to adopt technology in a culturally sensitive environment, alongside technical skills, to mitigate the resistance to change.

### 6.2. Future Direction

Future studies should examine the need to design AI adoption frameworks pertinent to various cultures across various parts of the globe. More research in other regions with high cultural barriers to adopting AI is needed to get more qualitative data that can explain the impact of culture on AI acceptance or rejection. Furthermore, future studies should also examine the leadership aspect of AI implementation, especially how leadership can help the organization implement accepted AI technology in all corporate layers. Lastly, research on training for various AI in culturally diverse settings is needed as training was also found to be sufficient to overcome resistance.

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