



DIGITAL TRUST AND DIGITALIZATION OF CONSTRUCTION INDUSTRY

Robert Klinc and Anja Brelih

University of Ljubljana, Faculty of Civil and Geodetic Engineering, Ljubljana, Slovenia

Abstract

Trust is a crucial but often overlooked factor in construction projects. Although trust is known to play a key role in successful projects, the specific types of trust, its importance and the growing role of digital trust in construction remain poorly understood. As the construction industry adopts more and more technology, building and maintaining digital trust is critical to overcoming challenges. This paper attempts to clearly define trust by reviewing existing research and adapting ideas from other fields to the particular challenges of construction. It provides a roadmap for understanding trust as a practical requirement for successful construction projects.

Introduction

Trust is increasingly recognized as central to the success of construction projects, but its role remains unacknowledged in the context of an industry characterized by fragmented teams, complex contracts and ad hoc collaboration. Construction projects inherently involve different stakeholders, each with different priorities, risk tolerances and communication styles. While technical competencies, contractual agreements and risk management frameworks dominate the traditional discourse on project performance, the interpersonal and organizational dynamics that form the basis of trust are often only discussed informally. The aim of this paper is to systematically identify the importance of trust, types of trust and the role of digital trust in construction projects and to adapt existing interdisciplinary research on trust to the unique challenges and opportunities of construction projects.

The construction industry's reliance on temporary multi-organizational teams (historically known as virtual organizations) combined with significant financial investment and long project lifecycles creates an environment in which trust can either increase efficiency or delay project progress. Delays, cost overruns and disputes, common pitfalls in construction, are often attributed to misunderstandings, adversarial relationships and a lack of transparency, all which stem from trust deficits. Outside of construction, disciplines such as organizational behavior, supply chain management and psychology have extensively explored trust as a mechanism for reducing transaction costs, improving collaboration and fostering innovation (Mayer

et al., 1995; Rousseau et al., 1998). In the construction-specific literature, however, trust is often only implicitly addressed and not explicitly analyzed.

This gap is becoming increasingly problematic in the era of Construction 5.0. While Construction 4.0 was about harnessing the potential created by the massive digitization of information and material processes, large amounts of data in digital form and technologies such as BIM, Big Data, Internet of Things, Machine Learning, Artificial Intelligence and Augmented Reality (Klinc and Turk, 2019), Industry 5.0, and therefore Construction 5.0, adds social aspect of digitalization, harmonizing technology with human values, societal needs, and planetary boundaries (European Commission, 2021). The consequences of the change of direction will also be felt in the construction industry, as the changes affect all areas and will be reflected particular in the trust between the players in the construction industry.

Recently, most efforts have been focused on blockchain, which has been seen as a key technology for enhancing trust in Construction 5.0. Many have argued that ensuring integrity provides benefits such as improved transparency, security and traceability in contract administration, supply chain logistics and facilities management. This fragmented treatment obscures a holistic understanding of how trust works in the construction industry and limits the development of targeted strategies to promote trust.

The contribution of this paper is twofold. First, it consolidates the scattered findings on trust and especially trust in architecture, engineering and construction (AEC) industry, provides conceptual clarity and identifies priority areas for future research. Second, it introduces the concepts of technological and digital trust in the context of the recent advancements on technologies such as BIM, blockchain, artificial intelligence (AI) and other building blocks of Construction 5.0 initiative. This can form the basis for practitioners to recognize trust not as an abstract ideal, but as a tangible factor influencing project outcomes.

In an era characterized by increasing project complexity, globalized teams and the adoption of collaborative technologies, understanding the role of trust is not just academic, but essential to developing resilient, sustainable projects that are aligned with the interests of stakeholders.

Trust

There are many attempts to define trust, mostly from the context of psychology and sociology and some of them have origins deep in the 20th century. Rousseau et al. (1998) cited a widely accepted definition of trust as a “*psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another*”.

Even before that, back in 1979, (Luhmann, 2017), for example, defined trust as “*a mechanism to reduce social complexity by allowing individuals to act as if uncertain futures were certain*”. This definition suggests that trust encompasses not only the perceptions that individuals have about others, but also their willingness to act on these perceptions.

Fukuyama (1995) definition is more utopian, describing trust as “*the expectation that arises within a community of regular, honest, and cooperative behavior, based on commonly shared norms*”.

Going from individual to organization and organizational trust, Mayer et al. (1995) defined trust as “*the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party*”. It seems that this definition fits perfectly with the dynamic nature of the (virtual) ad hoc organization of construction projects and sets a stage for the risk assessment and mitigation of construction project management.

Types of trust

Trust is a multi-layered concept that underpins human interactions, institutional stability and technology adoption. Its nature varies across disciplines, reflecting different priorities: from psychology, which focuses on interpersonal relationships, to sociology, which studies social cohesion, to computer science, which focuses on the reliability of algorithms. This list categorizes the main types of trust by academic field:

- Psychology & Social Psychology (Mayer et al., 1995; Lewis and Weigert, 1985; McAllister, 1995):
 - **Interpersonal Trust:** A belief in the reliability, honesty, and goodwill of another person, shaped by past interactions, perceived competence, and emotional bonds. It involves vulnerability and expectations of reciprocity.
 - **Benevolent Trust:** Trust rooted in the perception that another person acts with kindness, empathy, or altruism rather than self-interest.
 - **Cognitive Trust:** Rational, evidence-based trust formed through assessments of another’s competence, consistency, and reliability.
- Sociology (Uslaner, 2002; Paxton, 1999):
 - **Institutional Trust:** Confidence in formal societal structures (e.g., governments, courts, or

corporations) to act fairly and competently.

- **Generalized Social Trust:** Trust in strangers or abstract groups, reflecting belief in societal cohesion.
- Organizational Behavior (Rousseau et al., 1998; Dirks and Ferrin, 2002):
 - **Organizational Trust:** Employees’ collective confidence in an organization’s fairness, leadership, and culture.
 - **Trust in Leadership:** Subordinates’ belief in leaders’ competence, integrity, and concern for their welfare.
- Computer Science & Technology (Jøsang et al., 2007; Hancock et al., 2011):
 - **Cybersecurity Trust:** Confidence in digital systems’ ability to protect data and resist breaches.
 - **Trust in AI Systems:** User reliance on AI outputs, shaped by perceived accuracy, explainability, and ethical alignment.
- Economics & Behavioral Economics (Williamson, 1993; Zak and Knack, 2001):
 - **Trust in Economic Transactions:** Willingness to engage in exchanges without guarantees, assuming partners will reciprocate.
 - **Calculative Trust:** Deliberate assessment of risks and rewards before trusting, often in contractual or competitive contexts.

These are not all the categories, and the list is not exhaustive, but it shows us the complexity and importance of the topic of trust, the exploration of which goes back well into the twentieth century and in which new forms are constantly emerging. In particular, trust in relation to technology has been the most discussed topic in recent times.

Technological trust

Technological trust refers to the confidence that users, stakeholders or organizations place in the reliability, security and ethical alignment of a technology, system or platform. It encompasses the belief in the technology’s ability to function consistently, protect sensitive data and operate transparently without causing unintended harm. Unlike interpersonal trust, technological trust focuses on human interaction with machines, algorithms or digital systems and is crucial for acceptance, collaboration and long-term sustainability in technology-driven environments.

Some of the key components of technological trust are:

- **Reliability:** Trust that the technology will work as intended under various conditions (e.g. stability of the software, durability of the hardware).
- **Safety:** Confidence that the technology operates without causing harm even in unexpected scenarios (e.g. fail-safe mechanisms).

- **Security:** Trust in the ability of technology to protect data and resist cyber threats (e.g. encryption, access control).
- **Transparency:** Belief that the operation of the technology, the decision-making processes and the use of data are explainable and verifiable.
- **Ethical alignment:** The certainty that the technology complies with social norms, fairness and responsibility (e.g. avoidance of biased algorithms).

Technological trust is a dynamic, multidimensional construct that is essential for the acceptance and effectiveness of modern systems. As technologies such as AI, blockchain and IoT reshape industry (including construction), addressing trust gaps through robust design, ethical governance, and stakeholder engagement becomes imperative.

Since the adoption of BIM across the AEC sector, trust has become an increasingly important aspect of construction projects. This is especially true from a technology perspective, as the common data environment (CDE) is designed to be the only (single) source of truth (see Figure 1) and the collaboration of all parties in the construction project depends on the use of cloud-based CDE environments.

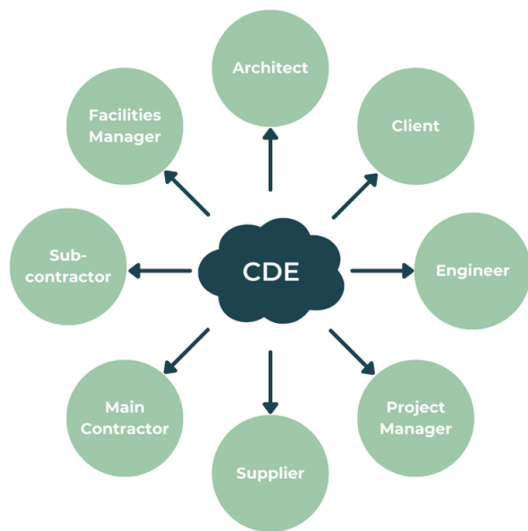


Figure 1: CDE as single source of truth.

A trusting relationship is important so that the parties involved regulate and respect the activities of the shared responsibility model, which describes how security in cloud-based environments is divided between providers and users.

Digital trust

In a world where digital technologies are increasingly integrated into daily life (either through online transactions, social media, cloud computing, artificial intelligence or the Internet of Things (IoT)) digital trust is critical to fostering a safe and secure digital ecosystem. Digital trust is the confidence users have in digital services and without it, they might be reluctant to use these services, which can hinder innovation, economic growth and societal progress.

Digital trust refers to the confidence that individuals, organizations and societies have in the security, privacy, reliability and ethical use of digital technologies, services and data. It encompasses the belief that digital systems, platforms and interactions work as expected, protect sensitive information and respect the rights and values of users. In other words, it emphasizes trust in data-driven interactions (e.g. e-commerce, cloud computing, social media).

Digital trust is a cornerstone of the modern digital landscape and has an impact on various aspects of our connected world. Firstly, it plays a crucial role in consumer confidence, as users are more willing to use digital services if they believe their data is secure and their privacy is respected. This confidence has a direct impact on business success, as companies that prioritize digital trust can build long-term relationships with their customers, fostering loyalty and driving revenue growth. Beyond individual businesses, digital trust also contributes to societal well-being by creating a healthier digital environment that encourages innovation while reducing risks such as identity theft, misinformation and cybercrime. In addition, regulatory compliance is another important aspect, as many countries and regions have introduced strict data protection laws such as GDPR and CCPA, which require companies to maintain digital trust to avoid legal penalties. Taken together, these factors underscore why digital trust is so important to individuals, organizations and society.

Digital vs. Technological Trust: Key Differences

While both concepts revolve around confidence in systems, digital trust and technological trust differ in focus, key concerns and primary users (see Table 1).

Table 1: Scope of digital and technological trust.

	Digital trust	Technological trust
focus	digital environments (e.g., web applications, IoT, cloud computing)	all technologies (e.g., robotics, construction technology)
key concerns	data privacy, cybersecurity, user authentication	reliability, ethical alignment, system transparency
primary users	consumers, businesses in online ecosystems	engineers, organizations, end-users of physical and/or digital technology

Digital trust focuses on how people interact with technology in digital environment. While digital trust is about the confidence that users place in digital systems, platforms or ecosystems to protect their data, ensure privacy and provide secure, reliable services in online environments, tech-

nological trust is a broader concept that encompasses trust in the entire spectrum (digital or physical) technology to function reliably, ethically, safely and securely. It encompasses trust in hardware, software, algorithms and human-machine interfaces.

Trust in construction projects

Trust is crucial in construction project management. While it is hard to build and easily broken, rebuilding trust is even harder (Cerić, 2015). The key factors that contribute to trust in such projects are effective communication, transparency, reputation and strong relationships (Cerić et al., 2021).

Wong et al. (2008) identified three types of trust elements in construction projects:

- **System-based trust** is based on structures, processes or institutional safeguards and not on personal relationships (affect-based trust) or assessments of competencies (cognition-based trust). In construction and other industries, it relies on formal mechanisms that ensure predictability, accountability and fairness, even in the absence of direct interpersonal connections.
- **Affect-based trust** refers to trust that is based on emotional bonds, interpersonal relationships and mutual caring rather than rational assessments of competence or reliability. It develops through repeated positive interactions, empathy and a sense of shared values or goodwill. In construction and other industries, this type of trust focuses on the quality of relationships rather than technical qualifications or contractual obligations. This type of trust enables resilience and long-term partnerships, especially in complex environments such as construction industry (Cerić et al., 2021).
- **Cognition-based trust** refers to trust that is based on a rational assessment of the competence, reliability and professionalism of the other party. It results from objective assessments of factors such as proven expertise (e.g. certifications, technical skills, compliance with safety standards), track record (e.g. successful completion of previous projects, adherence to deadlines and budgets), transparency in processes (e.g. clear documentation, open communication about risks or delays) and general reputation (e.g. reputation in the industry, customer testimonials, compliance with regulations). Cerić et al. (2021) observed that fostering such trust requires the consistent demonstration of competence and accountability, as breaches (e.g. safety failures, cost overruns) can severely damage trust and are difficult to restore. It is critical for assessing and mitigating risks.

All three forms of trust are of almost equal importance, since the three facets of trust co-exist and are mutually dependent. A system is only as good as its weakest point,

hence a trust building project manager must be able to install robust system, care for the stakeholders and team members (Wong et al., 2008).

Trust in IPD & BIM

Integrated Project Delivery (IPD) is a collaborative approach to construction and design that emphasizes early involvement of all key stakeholders (architects, engineers, contractors, owners and suppliers), sharing of risk, reward, and open communication. As pointed out by Kent and Becerik-Gerber (2010), IPD aligns the incentives and objectives of the project team.

Unlike traditional methods, IPD fosters a team-oriented environment where decisions are made collaboratively, often supported by a contractual framework that incentivizes collaboration rather than individual accountability. Key principles include:

- **Early stakeholder involvement:** All parties work together from the beginning of the project.
- **Shared risks and rewards:** Financial incentives are based on project success, not individual performance.
- **Transparency:** Open data exchange and decision-making.
- **Focus on results:** Value, efficiency and innovation take precedence over rigid adherence to original plans.

BIM is the technological backbone that enables the collaborative ethos of IPD, while IPD provides the contractual and cultural framework to maximize the potential of BIM. Their integration represents a paradigm shift in construction, emphasizing teamwork and technology for smarter project delivery.

Pishdad-Bozorgi and Beliveau (2016) emphasized that trust-based relationship is critical in building an integrated and collaborative team. The flow of information in the era of digital technologies in construction has been facilitated primarily by the use of BIM technologies and the principle of open communication (Pishdad-Bozorgi and Beliveau, 2016), mostly based on trust rather than contractual obligations.

Rashidian et al. (2024) found that the key elements to building trust, effective collaboration and the implementation of IPD within BIM/IPD/lean construction are: visual metrics, input from all collaborators, just-in-time delivery and adaptive resourcing.

Pishdad-Bozorgi and Beliveau (2016) identified specific IPD traits that promote different types of trust, such as system-based, affect-based, and cognition-based trust. While IPD fosters trust, the success of trust-based relationships also hinges on the quality of agreements and team member characteristics. The research emphasizes the importance of equitable contracts and selecting partners committed to IPD principles for successful collaboration:

- **System-based trust** arises from clearly defined, fair contracts that align efforts and rewards and require active engagement from teams rather than just legal oversight.

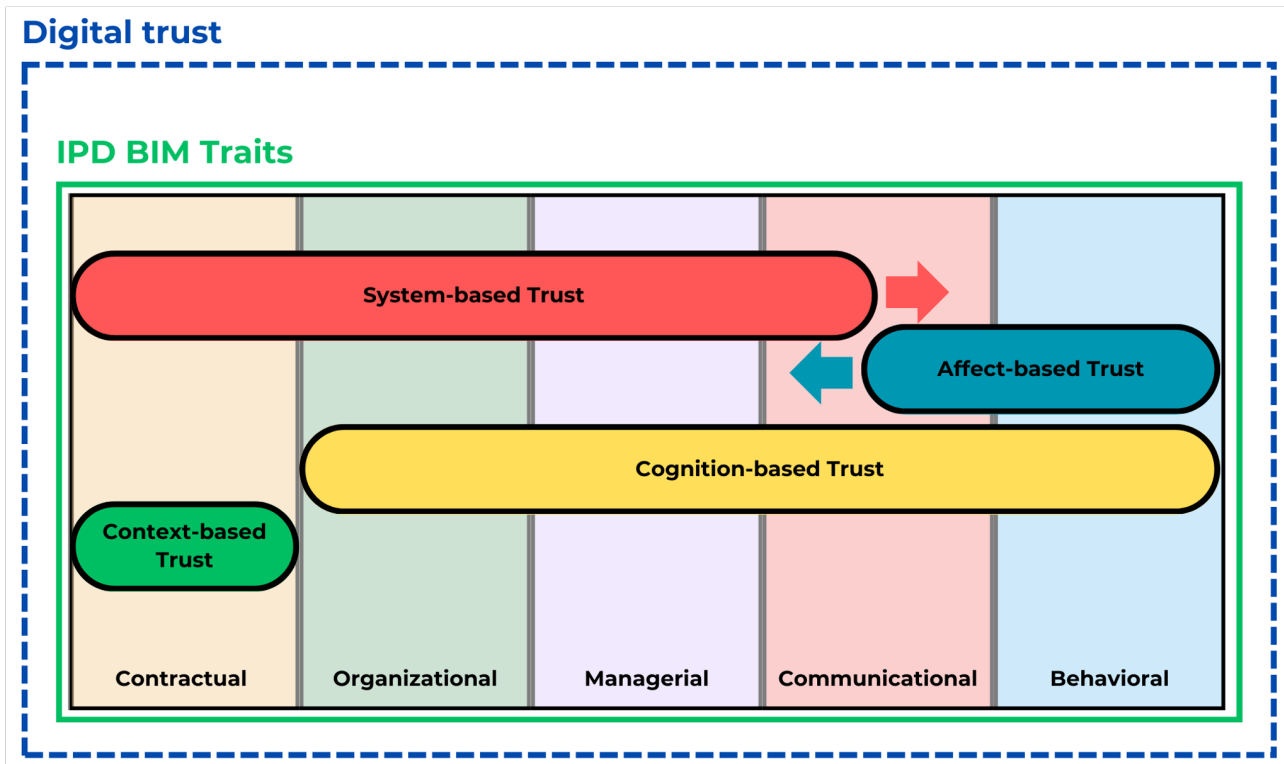


Figure 2: Expanding role of trust across IPD/BIM traits (inspired by Pishdad-Bozorgi and Beliveau (2016)).

- **Affect-based trust**, which is based on behavioral principles such as mutual respect, is highly dependent on individual relationships and team selection.
- **Cognition-based trust** is fostered through organizational, managerial, communication and behavioral strategies, with personal attributes such as competence and reputation directly influencing trust independent of IPD implementation.

Besides above-mentioned types of trust Pishdad-Bozorgi and Beliveau (2016) also introduced the fourth one:

- **Context-based trust**, which represents the external contextual features that could influence the behavior of the interacting parties and their relationships.

For an IPD contract to be effective in fostering trust, it must serve as an actionable guideline, not just a risk-shifting document that requires buy-in from the bottom-up participants, not just senior management. Best practices and lessons learned can be embedded in contracts to help build trust and improve project outcomes. By developing a schema linking trust-building attributes with IPD traits (contractual, organizational, managerial, communicational, behavioral), their study provided a framework to guide project teams in designing trust-centered delivery systems (see Figure 2).

This is consistent with previous findings and fits well into the landscape of BIM and CDE.

Trust in CDE-based BIM workflows

Trust (whether cognition-based, affect-based or system-based) is often underdeveloped, leading to collaboration difficulties, and security and privacy issues. This lack of trust can put critical information at risk and hinder collaboration between stakeholders in shared responsibility models.

In CDE-based BIM workflows, trust manifests itself through transparent data exchange, standardized processes, secure collaboration and open communication. It is based on accountability, adherence to industry standards and the ability to resolve conflicts constructively. When trust is built, stakeholders can work together more effectively, leading to higher quality projects, lower risks and better project outcomes.

Despite the inherent complexity and potential challenges of CDE-based BIM workflows, there are mechanisms that promote system-based, affect-based and cognition-based trust between stakeholders. These mechanisms ensure that trust in BIM environments is not only possible, but also actively cultivated, even when there are obstacles such as conflicts of interest, technical problems or communication barriers.

System-based trust depends on the reliability and effectiveness of the systems and technologies used in BIM workflows. It reflects confidence in the tools, processes and governance structures that underpin collaboration.

- A well-designed CDE ensures secure, organized and accessible data storage. Stakeholders trust the sys-

tem because it guarantees that important information is protected, up-to-date and always available.

- The ability of the various software tools to integrate seamlessly into a BIM ecosystem increases confidence in the overall system.

System-based trust is critical in BIM to improve collaboration, manage risk and ensure projects run smoothly, even when personal relationships or reputational knowledge are insufficient. For this reason, its importance goes beyond management, organizational and contractual strategies and encompasses communicative and even behavioral aspects of BIM-based construction projects (as seen with an arrow on Figure 2).

Affect-based trust, based on emotional connections, interpersonal relationships and mutual respect, develops over time as stakeholders interact and build a relationship with each other. In BIM workflows, affect-based trust is fostered through mechanisms that encourage collaboration and empathy.

- By defining clear, shared goals at the beginning of a project, stakeholders are aligned towards a common goal. When everyone understands and is committed to the same goals, it fosters a sense of unity and collaboration and strengthens affect-based trust.
- Pre-agreed rules for communication and collaboration with clear instructions for handling information security, data protection and collaboration practices help partners build trust through shared commitments to project integrity. The BIM execution plan (BEP), as a comprehensive document that helps project stakeholders move forward with clear roles and expectations, ensures just that.

In BIM environments, affect-based trust goes beyond the behavioral characteristics traditionally emphasized in IPD research (as seen with an arrow on Figure 2), as collaborative workflows prioritize communication clarity, consistency, and responsiveness. This shift reflects how multidisciplinary teams now rely on transparent information sharing and adaptive dialog to align stakeholders rather than predefined behavioral norms tied to specific roles.

Cognition-based trust is based on the belief that others have the necessary skills, knowledge and abilities to perform their tasks effectively. In a BIM context, this type of trust is built through mechanisms that demonstrate expertise and reliability.

- By adhering to industry standards such as IFC (Industry Foundation Classes) or ISO 19650, stakeholders can rely on consistent data formats and processes. This ensures that all parties understand how information is structured and shared, reducing cognitive load and increasing confidence in each other's abilities.

- Certifications like buildingSMART certification or software-specific training programs confirm expertise and thus strengthen cognitive trust.

To summarize, cognition-based trust is supported by demonstrating competence and expertise, affect-based trust is fostered by interpersonal interactions and shared goals, and system-based trust is ensured through reliable technology and governance structures. Together, these mechanisms create a resilient framework for trust in BIM that enables stakeholders to overcome challenges and collaborate effectively despite the odds.

The role of digital trust

Trust in the construction industry is increasingly anchored in blockchain technology (Hwang et al., 2024), which provides transparency, security and immutability in complex supply chains and multi-stakeholder projects, mostly through smart contracts (Turk and Klinc, 2017). However, it is not the only factor that ensures digital trust in the construction industry, as the concept is much broader.

Digital trust in construction and in general is a multi-layered concept that integrates system-based, affect-based and cognition-based trust, each of which contributes uniquely to a user's confidence in digital environments (see Figure 2). It is cultivated through the dynamic interplay and overlap between all three components.

- System-to-cognition interactions demonstrate how robust security mechanisms (system-based) directly improve users' perceptions of reliability and dependability (cognition-based) and thus promote confidence in the functionality of a platform.
- Similarly, affect-to-cognition shows that a seamless, positive user experience (affect-based), characterized by intuitive user interfaces or responsive design, can reinforce perceptions of competence and efficacy (cognition-based) by combining emotional satisfaction with cognitive evaluation.

Ultimately, holistic trust is created when these elements work together synergistically. For example, a CDE that integrates security (system), user-friendly navigation (cognition) and reassuring, empathetic branding (affect) creates a cohesive environment in which users feel technically secure, cognitively confident and emotionally validated, solidifying trust across all dimensions.

Discussion

Digital trust is not a standalone concept but an aggregate of system-, cognition-, and affect-based trust. Each dimension addresses distinct user concerns:

- System-based ensures structural integrity.
- Affect-based fosters emotional engagement.
- Cognition-based provides rational assurance.

Their synergy determines the overall trustworthiness of digital platforms, shaping user behavior and adoption in the digital ecosystem.

As early as 2013, Klinc et al. (2013) argued that the slow adoption of collaborative technologies in the AEC industry is due to four main barriers:

- **Cultural resistance:** the success of implementation depends on organizational culture, trust and human factors, not just technology. Resistance to change is widespread, as employees often prefer familiar systems and see few immediate benefits.
- **Technological and security concerns:** Data protection and privacy priorities are at odds with openBIM principles, so tools must conform to traditional security protocols. IT departments also struggle to manage the various technologies.
- **Awareness and generational differences:** Limited understanding of advanced tools. Younger employees who adapt quickly are underestimated, while older employees require extensive training.
- **No one-size-fits-all model:** Each organization must tailor implementation to its unique structure and needs, despite available best practices.

These factors hindered the integration of collaborative technologies into AEC workflows and directly undermine trust in digital environments, reinforcing skepticism and reluctance. Together, these barriers create a cycle of distrust:

- Tools are seen as risky (due to security concerns or cultural resistance).
- Adoption remains fragmented (due to generational divides or poor customization).
- Outcomes are inconsistent, reinforcing perceptions that digital environments are untrustworthy.

Until AEC organizations address these barriers holistically (aligning technology with culture, prioritizing security without stifling collaboration, bridging generational divides, and customizing implementations), trust in digital ecosystems will remain fragile, slowing innovation and collaboration in an increasingly digital-first world.

Conclusion

Digital trust is essential for creating a sustainable and resilient digital world where users feel safe and confident in their interactions with technology. It requires collaboration between individuals, businesses and governments to ensure that digital systems are secure, reliable and trustworthy.

Digital trust in construction projects is increasingly vital as the industry faces challenges like cybersecurity threats and data privacy concerns. Organizations must prioritize robust security measures, transparency, and collaboration to build trust.

In summary, building and maintaining digital trust in CDE-based BIM workflows is critical to overcoming the challenges of digital transformation in the construction sector. This trust is critical in the era of cloud-based

platforms and SaaS applications, as organizations and individuals increasingly rely on remote systems to store, process and manage sensitive data, requiring unwavering confidence in security, privacy and operational reliability. As AI becomes more prevalent, digital trust will become even more important to address ethical concerns, ensure transparency in algorithmic decision-making and safeguard against bias so that users can confidently adopt technologies that shape industries, governance and daily life.

Acknowledgments

This research was supported by the Slovenian Research and Innovation Agency (ARIS) under the Young Researcher funding program and research program E-Construction (E-Gradbeništvo: P2-0210).

References

- Cerić, A. (2015). *Trust in construction projects*. Routledge, Taylor Francis Group.
- Cerić, A., Vukomanović, M., Ivić, I., and Kolarić, S. (2021). Trust in megaprojects: A comprehensive literature review of research trends. *International Journal of Project Management*, 39(4):325–338.
- Dirks, K. T. and Ferrin, D. L. (2002). Trust in leadership: Meta-analytic findings and implications for research and practice. *Journal of Applied Psychology*, 87(4):611–628.
- European Commission (2021). *Industry 5.0 – Towards a sustainable, human-centric and resilient European industry*. Publications Office of the European Union.
- Fukuyama, F. (1995). *Trust: The Social Virtues and the Creation of Prosperity*. Free Press Paperbacks.
- Hancock, P. A., Billings, D. R., Schaefer, K. E., Chen, J. Y. C., de Visser, E. J., and Parasuraman, R. (2011). A meta-analysis of factors affecting trust in human-robot interaction. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 53(5):517–527.
- Hwang, S., Blay, K., Osmani, M., and Wang, M. (2024). The role of blockchain in enhancing trust: A construction project governance approach. In *Proceedings of the 2024 European Conference on Computing in Construction*. European Council for Computing in Construction.
- Jøsang, A., Ismail, R., and Boyd, C. (2007). A survey of trust and reputation systems for online service provision. *Decision Support Systems*, 43(2):618–644.
- Kent, D. C. and Becerik-Gerber, B. (2010). Understanding construction industry experience and attitudes toward integrated project delivery. *Journal of Construction Engineering and Management*, 136(8):815–825.

- Klinc, R. and Turk, Ž. (2019). Construction 4.0 – digital transformation of one of the oldest industries. *Economic and Business Review*, 21(3):393–410.
- Klinc, R., Turk, Ž., and Dolenc, M. (2013). Engineering collaboration 2.0: requirements and expectations. *Journal of Information Technology in Construction (ITcon)*, 14(31):473–488.
- Lewis, J. D. and Weigert, A. (1985). Trust as a social reality. *Social Forces*, 63(4):967.
- Luhmann, N. (2017). *Trust and Power*. Polity Press, Oxford, England.
- Mayer, R. C., Davis, J. H., and Schoorman, F. D. (1995). An integrative model of organizational trust. *The Academy of Management Review*, 20(3):709–734.
- McAllister, D. J. (1995). Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *The Academy of Management Journal*, 38(1):24–59.
- Paxton, P. (1999). Is social capital declining in the united states? a multiple indicator assessment. *American Journal of Sociology*, 105(1):88–127.
- Pishdad-Bozorgi, P. and Beliveau, Y. J. (2016). A schema of trust building attributes and their corresponding integrated project delivery traits. *International Journal of Construction Education and Research*, 12(2):142–160.
- Rashidian, S., Drogemuller, R., and Omrani, S. (2024). An integrated building information modelling, integrated project delivery and lean construction maturity model. *Architectural Engineering and Design Management*, 20(6):1454–1470.
- Rousseau, D. M., Sitkin, S. B., Burt, R. S., and Camerer, C. (1998). Introduction to special topic forum: Not so different after all: A cross-discipline view of trust. *The Academy of Management Review*, 23(3):393–404.
- Turk, Ž. and Klinc, R. (2017). Potentials of blockchain technology for construction management. *Procedia Engineering*, 196:638–645.
- Uslaner, E. M. (2002). *The Moral Foundations of Trust*. Cambridge University Press.
- Williamson, O. E. (1993). Calculativeness, trust, and economic organization. *The Journal of Law Economics*, 36(1):453–486.
- Wong, W. K., Cheung, S. O., Yiu, T. W., and Pang, H. Y. (2008). A framework for trust in construction contracting. *International Journal of Project Management*, 26(8):821–829.
- Zak, P. J. and Knack, S. (2001). Trust and growth. *The Economic Journal*, 111(470):295–321.