**Questionnaire on Factors Influencing Digital Transformation in Construction Enterprises**

Dear Respondent,

Hello! I am a master's student in civil engineering currently conducting research on the factors influencing digital transformation in construction enterprises. The purpose of this questionnaire is to identify the key factors affecting digital transformation in construction companies, thereby providing targeted recommendations to further advance their digital transformation efforts. The results of this survey will be used solely for academic research and will not be utilized for any other purposes. The questionnaire is anonymous. Your insights hold significant value for this research. We sincerely appreciate your willingness to take time from your busy schedule to complete this questionnaire. Thank you for your support. Wishing you a productive day!

Part I: Basic Information

1. Your Educational Background: (Single choice) ○ Associate Degree ○ Bachelor's Degree ○ Master's Degree or Higher

2. Your Years of Work Experience: (Single choice) ○ Less than 5 years ○ 5-10 years ○10-15 years ○ Over 15 years

3. Your Employer: (Single choice) ○ Construction entity ○ Construction contractor ○ Design firm ○ Consulting firm ○ Supervision unit ○ Government agency ○ University or research institution ○ Other

4. Nature of your employer: ○ State-owned ○ Privately owned ○ Other

5. Your professional title: (Single choice) ○ Professor ○ Associate Professor ○ Senior Professional Title ○Senior Professional Title ○ Intermediate Professional Title ○Below Intermediate Professional Title

6. Your Position: ○ Senior Management ○ Middle Management ○ Frontline Management ○ Other Management

7. Your Level of Understanding Regarding Digital Transformation in Construction Enterprises: ○ Very Familiar ○ Fairly Familiar ○ Somewhat Familiar ○ Not Very Familiar

Part II: Survey on the Importance of Factors Affecting Digital Transformation in Construction Enterprises

The following factors were compiled through literature review and expert consultation as key influences on digital transformation in construction enterprises. Based on your professional experience and understanding of the current situation, please assess whether each factor is likely to impact digital transformation in construction enterprises. This questionnaire employs a 5-point Likert scale, categorizing impact levels as: Minimal Impact, Slight Impact, Moderate Impact, Significant Impact, and Major Impact. Scores are assigned as follows: 1 = Minimal Impact, 2 = Slight Impact, 3 = Moderate Impact, 4 = Significant Impact, 5 = Major Impact.

1. Evaluation of Impact Factor Influence Levels

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dimensi-on | Influencing Factors | Impact Assessment | | | | |
| 1 | 2 | 3 | 4 | 5 |
| Technol-ogy | Digital Technology Maturity Level (The level of development of digital technologies in the construction sector, including the maturity of technologies such as cloud computing, big data, the Internet of Things, and artificial intelligence) |  |  |  |  |  |
| Digital Technology Application and Integration Level (The actual application level of digital technology within construction enterprises and its integration level with other business processes) |  |  |  |  |  |
| Digital Infrastructure (the information and communications technology system required for the configuration, monitoring, and operation and maintenance of network equipment and related systems) |  |  |  |  |  |
| Digital Platform Development (referring to the level of development of digital platforms for technology resource sharing and industrial collaboration) |  |  |  |  |  |
| Digital Collaboration Level (referring to the efficiency of data sharing and collaboration across departments and enterprises) |  |  |  |  |  |
| Organiz-ation | Digital Strategy (a plan designed to address the challenges of digital transformation) |  |  |  |  |  |
| Organizational Culture (Core Values, Behavioral Norms, and Cognitive Paradigms) |  |  |  |  |  |
| Organizational Structure (The fundamental form of division of labor and collaboration within an organization) |  |  |  |  |  |
| Management Innovation (Breaking away from traditional management models to establish data-driven decision-making mechanisms and agile organizational processes) |  |  |  |  |  |
| Transition Costs and Benefits (Initial Investment and Long-Term Returns of Digital Transformation) |  |  |  |  |  |
| Managerial Support and Leadership (referring to the degree of alignment and implementation efforts by senior executives regarding digital transformation) |  |  |  |  |  |
| Environ-ment | Policy Support System Maturity (Refers to the systematic nature and operational feasibility of government policies, including digital technology standards, data security regulations, and fiscal incentives) |  |  |  |  |  |
| Policy Support and Incentives (Government provides financial policies such as loan interest subsidies, tax breaks, and fiscal subsidies) |  |  |  |  |  |
| Unified Technical Standards (referring to unified technical standards and specifications) |  |  |  |  |  |
| Industry Competition and Cooperation (referring to the competitive and cooperative relationship between enterprises within the construction industry) |  |  |  |  |  |
| Market demand (referring to consumer demand for construction products or services) |  |  |  |  |  |
| Economic, Social, and Cultural Environment |  |  |  |  |  |
| Industry Digitalization Level (referring to the overall digital development level of the construction industry) |  |  |  |  |  |
| Personn-el Manage-ment | Digital Talent Pool (referring to the quantity and quality of multidisciplinary professionals) |  |  |  |  |  |
| Employee willingness (referring to employees' attitudes toward and acceptance of digital transformation) |  |  |  |  |  |
| Corporate Talent Competency (referring to employees' digital literacy and professional skills) |  |  |  |  |  |
| Digital Project Implementation Team (referring to a team or department specifically responsible for digital transformation) |  |  |  |  |  |
| Corpora-te Capabili-ties | Digital Dynamic Capability (the ability to perceive, acquire, integrate, and adapt to digital technologies and applications) |  |  |  |  |  |
| Risk prevention and control capability (the ability to identify, assess, and address various potential risks during the digital transformation process) |  |  |  |  |  |
| Resource base (resources already possessed or accessible) |  |  |  |  |  |
| Technological Innovation and R&D Capabilities (referring to a company's technical capacity to independently develop or modify digital solutions) |  |  |  |  |  |
| Change Management Capability (refers to a construction company's systematic ability to coordinate multiple stakeholders' interests and resolve resistance during digital transformation) |  |  |  |  |  |

(2)Evaluation of Digital Transformation Effectiveness Metrics for Construction Enterprises

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| --- | --- | --- | --- | --- | --- | --- |
|  | Indicator | 1 | 2 | 3 | 4 | 5 |
| 1 | Business Efficiency Enhancement |  |  |  |  |  |
| 2 | Customer Satisfaction |  |  |  |  |  |
| 3 | Cost-Benefit Optimization |  |  |  |  |  |
| 4 | Digital Innovation Level |  |  |  |  |  |