# Contents

*Intelligent Construction and Construction Informatization*

A Framework for the Contract Management System in Cloud-Based ERP for SMEs in the Construction Industry
Yuan Chen, Meng Wang, and Ling Li

A Discrete Event Simulation-Based Analysis of Precast Concrete Supply Chain Strategies Considering Suppliers’ Production and Transportation Capabilities
Shiwei Chen, Kailun Feng, Weizhuo Lu, Yaowu Wang, Xue Chen, and Shuo Wang

Applying Generative Adversarial Network to Combine Occupant Responses to Design Contexts in Immersive Virtual Reality with Existing Building Performance Models
Chanachok Chokwitthaya, Yimin Zhu, and Supratik Mukhopadhyay

Construction Workers’ Behaviors Recognition Using 2D Image Human Skeleton Parameterized Method
Ankang Ji, Xiaolong Xue, Yudan Dou, and Yuna Wang

Information Modelling (BIM) Framework for Practical Assessment
Dat Tien Doan, Ali Ghaffarianhoseini, Nicola Naismith, Tongrui Zhang, Attiq Ur Rehman, John Tookey, and Amirhosein Ghaffarianhoseini

Gustav Jansson, Jani Mukkavaara, Fredrik Elgh, and Martin Lennartsson

A System Dynamics Model of Prevention through Design Regarding Unsafe Behavior in Construction
Xinlu Sun and Pinchao Liao

Yongyue Liu, Yaowu Wang, and Xiaodong Li

Global Building Information Modeling Maturity
Chi Tian, Yunfeng Chen, Jiansong Zhang, and Robert F. Cox

Study on Influencing Factors of BIM Adoption in China’s Construction Industry Based on FA-SEM Model
Yun Le, Xinyue Zhang, and Mingqiang Liu
Incentive Compensation Structure for Cost Control of Construction Project
Based on IPD-Ish in China ................................................................. 101
Qiankun Wang, Tingting Mei, Lingwei Kong, and Yaping Xiao

The Application Value of BIM Technology in Prefabricated Building Based on
EPC General Contracting Management Model ....................................... 109
Yunbo Li and Zun Pei

Research on Top-Level Redesign of Smart Construction System Based on
Case Study .............................................................................................. 117
Feng Shi, Qingchun Wang, and Yiyue Wang

Comparative Research of Integration Application with BIM Based on Mapping
Knowledge Domains at Home and Abroad ............................................. 125
Wenting Song and Qingpeng Man

Initial Logistics Management System of Prefabricated Component Based on
BIM and RFID Technology .................................................................... 135
Yan Liu, Lin Qi, and Yingbo Ji

Research on Simulation of Promotion Policies for New Technology Application
in Construction Industry Based on System Dynamics .............................. 144
Jianhui Li and Lei Li

Optimization of Integrating Inventory and Transportation of Engineering
Logistics Based on an Improved Heuristics Approach .............................. 153
Hui Wang, Jinbo Guan, and Shuo Wang

Construction and Real Estate Education Curriculum Reform Based on BIM:
Taking Legal System of Construction Contract Course as an Example ...... 161
Shuhong Zhang and Mengxi Gao

Energy Internet Development Based on Blockchain Technology .......... 167
Xuefeng Zheng, Hongyu Jia, and Jinsong Wang

The Application of BIM in Urban Rail Transit Project ............................ 179
Xiaoxi Liu, Chengjie Xu, and Qian Jing

Application of BIM Technology in Zhuhai Port Project of Hong Kong-
Zhuhai-Macao Bridge ........................................................................... 185
Taotao Mo, Fan Wu, Yuan Zhang, and Mingquan Wang

Measuring the Underlying Structure of Classic Topics in Construction
Engineering and Management: An SNA-Based Analysis ...................... 192
Zebin Zhao, Hengqin Wu, Xiaolong Xue, Geoffrey Qiping Shen, and Xin Li
Visual Simulation for Optimization and Application in Tunnel Schedule Engineering ................................................................. 199
Wei Zhong and Peiyao Wang

Innovative Construction Project Management

Construction Supply Chain Integration: Past and Future ........................................ 204
Hao Lu, Xinghua Gao, Pardis Pishdad-Bozorgi, and Guangbin Wang

The Impact of PCSR on Financial Performance: Evidence from Chinese Construction Enterprises .................................................................................................. 215
Ying Jiang and Xiaolong Xue

Study on Risk Sharing of General Contracting for Construction Projects ............... 221
Jiading Zhang and Liangbao Li

Project Controls and Management Systems: Current Practice and How It Has Changed over the Past Decade ................................................................. 231
Kareem Mostafa and William O’Brien

Influence of Risk Factors on Project’s Objectives in Construction Industry of Pakistan ..................................................................................................................... 241
Asad Kamal, Hafiz Zahoor, Babar Ali, Suqrat Babar, and Ahsen Maqsoom

The Development Strategies of Public Art in Metro Architectural Space of Mega Cities in China ................................................................................................. 250
Han Cheng and Julian Worrall

Effects of Contractual Incentives in Construction Projects ....................................... 256
Yunhong Wang, Wenxin Shen, and Wenzhe Tang

Research on Construction Project Safety Management Model Built by Owner and Contractor ........................................................................................................ 263
Dawei Chen, Huanteng Zhao, and Guangyao Zhang

Meta-Network Modelling for International Construction Risk Management of Multiple Objectives .................................................................................................... 273
Tsenguun Ganbat and Pinchao Liao

Research on Application of Gray Correlation Analysis to Policy Formulation in Construction Industry ................................................................. 281
Shaolei Lv and Hongbing Li

Building the Model of Multi-Objective Cooperative Measurement for the Complex Construction Project ................................................................. 288
Jie Liu, Xianyu Tan, Yongliang Wang, and Zhenwu Shi
Research on Investment Return of PPP Project in Urban Underground Integrated Pipe Gallery .............................................................. 297 Jing Huang and Jun Fang

Research on Financial Early Warning of PPP Projects from Refinancing Perspective ........................................................................ 306 Wenhua Hou and Lun Wang

Linking Top Management Team’s Internal Social Capital and Project Performance in a Mega Construction Project: The Mediating Role of Behavioral Integration ........................................................................ 314 Jingyuan Wan, Yun Le, Jin Li, and Ge Wang

Study on the Performance Influencing Factors of Expressway Project Based on PPP Mode ...................................................................... 325 Xuan Zhang and Jun Fang

A Study on Stakeholder Relationship in Urban Renewal Projects: Case of Tianzifang in Shanghai ...................................................... 334 Hao Wang, Yaqin Cai, and Ran Gao

Exploration and Practice of the Combination of Active Concept and Multiple Teaching Methods in Cost Management of Construction Project .................................................................................. 343 Hui Yan, Huiyan Liu, Qiqi Li, Haiyan Zhang, and Qiyu Shen

Operation and Maintenance Performance Evaluation of PPP Project in Urban Underground Comprehensive Pipe Gallery ......................... 355 Yiyuan Guan and Jun Fang

An Empirical Study on the Factors Influencing the Capital Structure of PPP Projects ........................................................................... 362 Wenhua Hou and Min Zhao

A Study on Construction-Operation Integrated Management of Megaproject: A Case of ABC International Airport .................................. 370 Guangshe Jia, Hongyun Ma, Zhongyu Wang, Zhiyang Xu, Kaili Liu, Yuhao Liu, and Meng Zhang

Research on the Problem of Social Stability Risk Assessment for Major Projects ............. 381 Pengcheng Xiang and Siyu Luo

Study on Optimization of Operation and Maintenance Cost of Urban Underground Utility Tunnel Based on PPP Project .................. 387 Yu Zhang and Jun Fang

An Exploratory Analysis on Factors Affecting the Implementation of Urban Renewal Projects in Shenzhen, China ........................................ 396 Yani Lai
Research on the Quality Demand of Construction Management Industry Based on Factor Analysis ................................................................. 407
Xiang Gu, Yingying Luo, and Yalan Deng

Risk Identification and Evaluation of Urban Underground Pipe Gallery PPP Project Based on Improved AHP ......................................................... 415
Xukun Liu and Jun Fang

Comprehensive Evaluation of PPP Project Construction for Urban Underground Pipe Gallery ........................................................................... 425
Zhixiang Tong and Jun Fang

Market Demand Forecasting Model of Urban Underground Comprehensive Pipe Gallery PPP Project ............................................................. 434
Shujin Li and Jun Fang

A Study on the Management Mechanism of Third-Party Safety Inspection within the Chinese Context .............................................................. 441
Lei Zhang, Hongyang Li, Yin Wu, Yousong Wang, Gui Xiong, and Hui Yan

Design of Service Evaluation System for Public Resource Trading Platform .................................................. 451
Jian Wang, Jun Fang, Yu Zhang, and Xukun Liu

Construction Industrialization and Sustainability

Research on the Constraints of the Development of Prefabricated Building in Dalian Based on ISM ................................................................. 461
Rui Zhao and Yaowu Wang

Comparison Study of Green Roof, Blue Roof, Green Blue Roof for Storm Water Management: A Review ............................................................. 475
Muhammad Shafique and Xiaowei Luo

Research on Prefabricated Building Promotion Based on Analytic Hierarchy Process ........................................................................... 483
Yanting Han, Shoujian Zhang, and Ruijie Qiu

Co-Reality in a Shared Virtual Environment (SVE): A Case Study of Highway Work Zone Construction .................................................................. 490
Sanaz Saeidi, Yimin Zhu, Masoud Zadghorban Lifkooee, Maryam Mollazadeh, and Xin Li

Identifying Key Risks of Private and Government Construction Project Failures in West Africa: Environmental and Social Performance ............................................. 498
Nikiema Mahamadi, Hui Yan, Lei Zhang, Hongyang Li, and Yousong Wang
Influencing Factors Analysis of the Prefabricated Component Demand in China
Based on Improved Gray Correlation Degree Model .......................................................... 509
Zeng Wang, Yan Liu, and Yingbo Ji

Exploring the Relationships between the Triple Bottom Line of Sustainability
in the Construction Industry .............................................................................................. 518
Weina Zhu, Xiaodong Li, and Zhihui Zhang

Application Analysis of Prefabricated Buildings under Green Construction ............... 527
Qingxin Xu and Lixin Sun

Research on Risk Factors of Emerging Information Technology Application in
Prefabricated Construction Enterprises ............................................................................ 535
Yan Liu, Zedong Zheng, and Yingbo Ji

Evolutionary Game Analysis of Knowledge Sharing in the Industrial Chain of
Construction Industrialization ......................................................................................... 543
Yanlin Wang and Hongbing Li

Study on Influence of Prefabricated Rate on the Cost of Prefabricated Building ............. 554
Chenyu Liu and Jianguo Chen

How Urban Neighborhood Environment Affects Quality of Life of Older Adults:
Enlightenments for Supporting “Aging in Place” ......................................................... 562
Fan Zhang and Dezhi Li

Research on Identification of Influencing Factors of Prefabrication Building
Cost Based on Improved Entropy and DEMATEL Method ............................................. 570
Yingbo Ji, Guoqiang Liu, and Yuan Qi

Research on Carbon Emissions Measurement of Reconstruction Projects Based
on Material Recovery ....................................................................................................... 577
Lipeng Wei

Developing Green Building under Low-Carbon Economy ............................................ 583
Ke Lu, Shenglan Jiang, and Siya Tang

Analysis on Restriction Cooperation Game among Prefabricated Component
Quality Responsibility Mutual Insurance Subjects ....................................................... 589
Hui Ding, Chenyao Lv, and Anze Zhang

Analyzing Affordable Housing Industrialization Status in Beijing from the
Perspective of Energy Saving and Emissions Reduction .............................................. 600
Zhiye Huang and Shasha Fu

Study on Life-Cycle Information Management of Prefabricated Components ............. 609
Fei Pang, Yuna Wang, Ruixue Zhang, and Liang Wang
Process Optimization Calculation Model and Empirical Research of Prefabricated Buildings Based on DSM .................................................................614
Likun Zhao and Zhuo Wang

Research on Energy Efficiency of Chinese Provincial Construction Industry from 2006 to 2015 Based on Super-SBM Model ..................................................622
Pengcheng Xiang, Zongyu Li, and Mingming Hu

Quantifying the Green Efficiency of the Construction Industry in China ...............631
Jianjian Teng and Yuan Chang

An Engineering Consumption Differences Calculation Model for Prefabricated and Conventional Buildings in China .......................................................640
Kai Qi, Yuan Qi, and Yingbo Ji

Carbon Emissions Analysis for Construction Process ..............................................648
Yuan Fang, Xiaoqing Lu, and Yufan Zhang

Research on Realization Approach of Green Building Based on Project Life Cycle Theory .................................................................................................655
Zhenxiang Shi

Economic Benefit Calculation Model for Prefabricated Buildings in China Based on Cash Flow ..........................................................661
Siwei Chang, Yuan Qi, and Yingbo Ji

Comparative Study of Industrialized Construction Logic between General Prefabricated and Improved Prefabricated Construction in China ..................669
Long Li, Zhongfu Li, Mengqi Yuan, and Shengxi Zhang

Real Estate and Land Management

Analysis of Operational Efficiency of Real Estate Companies Based on DEA ..........678
Yudan Dou, Xiaolong Xue, Yuna Wang, Ankang Ji, and Ting Luo

Research on the Factors Affecting the Price Elasticity of China’s Housing Supply: An Empirical Analysis Based on Panel Data ........................................685
Zijing Wu and Lin Zhu

The Influence of Community Opening on Road Capacity ........................................692
Xue Chen and Yaowu Wang

Research on the Impact Factors of Housing Affordability for Young University/College Graduates in Guangzhou ....................................................704
Fan Wu, Kailin Chen, Wenyao Huang, Daijunyue Yu, Xinyi Yang, and Boya Su
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research in Land Management Modes in China: A Comparative Study of “Three Old” Reform Policy</td>
<td>713</td>
</tr>
<tr>
<td>Ming Lei, Junhua Chen, Na Liu, and Hao Wang</td>
<td></td>
</tr>
<tr>
<td>Seismic Study of PHC Pipe Piles in High Pile Wharf</td>
<td>720</td>
</tr>
<tr>
<td>Shaojun Wang and Cuixuan Li</td>
<td></td>
</tr>
<tr>
<td>A Comprehensive Evaluation for Disaster Resilience of Smart Cities in China</td>
<td>733</td>
</tr>
<tr>
<td>Shiyao Zhu and Dezhi Li</td>
<td></td>
</tr>
<tr>
<td>“Asset-Light and Partnership-Heavy” Mode: Research on Strategic Transformation of the Real Estate Enterprise in China</td>
<td>741</td>
</tr>
<tr>
<td>Xiaoyuan Wang and Hongxing Wen</td>
<td></td>
</tr>
<tr>
<td>Spatial Characteristics and Influencing Mechanism of Housing Price in Polycentric Mountainous City: A Case Study of Chongqing Central City</td>
<td>748</td>
</tr>
<tr>
<td>Chao Mao and Linlin Zhang</td>
<td></td>
</tr>
<tr>
<td>The Impact of Capital Structure on Financial Performance of Real Estate Enterprises under Deleveraging</td>
<td>759</td>
</tr>
<tr>
<td>Wenguo Ai and Bangshi Chi</td>
<td></td>
</tr>
<tr>
<td>The Correlation Effect and Ripple Effect of Real Estate Industry: An Empirical Analysis on the Input-Output Table of Heilongjiang</td>
<td>766</td>
</tr>
<tr>
<td>Qun Cao and Shen Tian</td>
<td></td>
</tr>
<tr>
<td>Value Perspective: Research on the Influencing Factors of Housing Price Based on Structural Equation Model</td>
<td>773</td>
</tr>
<tr>
<td>Ya Zhao, Jingxin Gao, Yandi Zhou, Ningning Lang, and Weiguang Cai</td>
<td></td>
</tr>
<tr>
<td>Analysis of the Influence of Individual Factors on Housing Price: Based on the Data of Second-Hand Apartments in Beijing</td>
<td>784</td>
</tr>
<tr>
<td>Yuan Meng and Haoye Cheng</td>
<td></td>
</tr>
<tr>
<td>Junhua Chen and Yi Yang</td>
<td></td>
</tr>
<tr>
<td>Analysis of Land Financial Dependence and Discussion on Causes</td>
<td>802</td>
</tr>
<tr>
<td>Ningning Lang, Cun Liu, and Ya Zhao</td>
<td></td>
</tr>
<tr>
<td>A Critical Review of Water Adaptability in Urban Green Space under the Conception of Sponge City</td>
<td>810</td>
</tr>
<tr>
<td>Yu Zhang, Yunwei Zhou, Fucun Cao, Leichang Huang, and Yan Zhu</td>
<td></td>
</tr>
<tr>
<td>Research on Housing Satisfaction of Urban Residents from the Perspective of Household Characteristics</td>
<td>819</td>
</tr>
<tr>
<td>Tianxiang Li</td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>The Impact of Land Acquisition and Storage System on Housing Prices</td>
<td>826</td>
</tr>
<tr>
<td>Zhaian Bian, Junhua Chen, Guodong Liu, and Zhifeng Wang</td>
<td></td>
</tr>
<tr>
<td>Relevance on Neo-Urbanization and Real Estate Market in Heilongjiang</td>
<td>833</td>
</tr>
<tr>
<td>Qingguo Ran</td>
<td></td>
</tr>
<tr>
<td>Establishing a Third-Party Inspection System of Construction Work Safety</td>
<td>840</td>
</tr>
<tr>
<td>Yan Zhang, Xiangpeng Zeng, Hongyang Li, and Yousong Wang</td>
<td></td>
</tr>
<tr>
<td>Occupational Health Management in Road Construction Enterprises: A View of Cognitive Bias</td>
<td>852</td>
</tr>
<tr>
<td>Dan Chong, Lin Chen, and Jianxun Xie</td>
<td></td>
</tr>
<tr>
<td>Analysis and Countermeasures of Fabricated Building Policy in Guangzhou</td>
<td>859</td>
</tr>
<tr>
<td>Xiaoling Tang, Xiaolong Xue, Zeyu Wang, Yuna Wang, and Ting Luo</td>
<td></td>
</tr>
<tr>
<td>Social Cohesion and Urban Sprawl: Urbanization in the Perspective of Social Concern</td>
<td>868</td>
</tr>
<tr>
<td>Xiaoqing Ge and Buchen Wu</td>
<td></td>
</tr>
<tr>
<td>Urban Carbon Metabolism: Based on the Change of Cultivated Land Area</td>
<td>877</td>
</tr>
<tr>
<td>Yunyu Feng and Xuezhu Cui</td>
<td></td>
</tr>
<tr>
<td>The Impact of Land Intensive Use on Urban Development Quality in Mountain City: A Case Study of Chongqing, China</td>
<td>885</td>
</tr>
<tr>
<td>Hongyue Lv, Tingkwei Wang, and Yingchao Lin</td>
<td></td>
</tr>
<tr>
<td>Case Study on Shantytowns’ Reconstruction Mode with the New Urbanization</td>
<td>897</td>
</tr>
<tr>
<td>Yuanyuan Jiang and Zhirong Wang</td>
<td></td>
</tr>
<tr>
<td>Restraining the Illegal Sublease Phenomenon of Public Rental Housing in China: Based on Dynamic Evolutionary Game Theory</td>
<td>905</td>
</tr>
<tr>
<td>Shilong Li and Siyu Liu</td>
<td></td>
</tr>
<tr>
<td>Design and Efficiency Evaluation of Infrastructure Construction in 31 Chinese Provinces Using Input-Output Tables</td>
<td>914</td>
</tr>
<tr>
<td>Yongsheng Wang, Chenhuan Kou, and Guijun Li</td>
<td></td>
</tr>
<tr>
<td>Review of Compensation Policies for Land Acquisition and Demolition in China</td>
<td>925</td>
</tr>
<tr>
<td>Ling Li and Chenmei Xu</td>
<td></td>
</tr>
<tr>
<td>Study on Land Use Status and Land Ecosystem Service Value in Taiyuan City</td>
<td>931</td>
</tr>
<tr>
<td>Na Yang and Renhui Liu</td>
<td></td>
</tr>
<tr>
<td>The Feasibility Study of “Winter and Summer Park” in Urban and Suburban of North China</td>
<td>945</td>
</tr>
<tr>
<td>Xiaoduo Cheng</td>
<td></td>
</tr>
</tbody>
</table>
Research on the Cultivation of Engineering Management Professionals under the Background of Architectural Industrialization ................................................................. 950
Feiyan Zhao, Tiantian Xu, and Zhukun Yan