

中国核心期刊（遴选）数据库 收录期刊

# Value Engineering

中国商界文联 会刊

中国技术经济研究会价值工程专业委员会 会刊  
中国高等教育学会价值工程分会 会刊

中国期刊网 全文收录期刊  
中国学术期刊（光盘版）  
中国学术期刊综合评价数据库来源期刊  
万方数据—数字化期刊群入网期刊  
中文科技期刊数据库收录期刊

ISSN 1006-4311

CN13-1085/N

JIAZHI GONGCHENG

2022 9

下旬刊（总第 647 期 / 第 41 卷）

# 价值工程

ISSN 1006-4311



9 771006 431068



# 价值工程

2022年9月下旬刊 (总第647期 / 第41卷)

1982年创刊

2022年9月28日出版

中国商界文联会刊

中国技术经济研究会价值工程专业委员会会刊  
中国高等教育学会价值工程分会会刊

封面刊名题字：袁宝华

主管单位：

河北省科学技术协会

主办单位：

河北省技术经济管理现代化研究会

总顾问：管在源

总 编：高志彪

总编室：师瑞

电 话：0311-87024742

编辑部：马慧霞

电 话：0311-83020178

0311-83036626

传 真：0311-87024742

投稿信箱：vezzsbjb@163.com

网 址：www.vezzs.com

责任编辑：高生明

封面设计：王金军

版面设计：韩宇红

国际标准连续出版物号：ISSN 1006-4311

国内统一连续出版物号：CN 13-1085/N

国内邮发代号：18-2

国内订阅：全国各地邮局

国内发行：河北省报刊发行局

国外发行：中国国际图书贸易总公司

印 刷：廊坊市长岭印务有限公司

编辑出版单位：价值工程杂志社

社 址：石家庄槐安西路88号

邮 编：050091

国内定价：30.00元人民币

海外定价：30.00美元

# 目 录

## \* 价值管理 \*

- 核电厂强损仪控设备可靠性提升技术研究与实践 ..... 翟欣慰等(1)  
关于铁路营业线施工组织管理优化与创新成果的论述 ..... 方兴军等(6)  
BIM 技术在海外变电站施工履约应用研究 ..... 胡开拓等(10)  
EPC 项目管理绩效改善措施研究 ..... 朱月亮等(13)  
南京美高梅美荟酒店项目冷热源方案比选 ..... 李晗(16)  
某地铁联络通道采用“冷冻法”施工方案优化成本的比较与探讨 ..... 向书帆(19)

- 基于因子分析与聚类分析的我国计算机设备上市公司绩效评价 ..... 郭悦等(22)  
天长市城镇建设用地集约利用评价及优化策略研究 ..... 刘洋兵等(27)  
“碳视角”下能效变压器的采购策略研究 ..... 刘海珍等(30)  
建筑工程施工质量控制与进度控制研究 ..... 王春等(33)  
双碳目标下农用地碳排放研究进展及热点分析 ..... 张爱茜等(36)

## \* 价值链·供应链 \*

- 基于 AHP-模糊综合分析的农产品供应链信息共享研究 ..... 昝林伽(40)

## \* 功能载体创新 \*

- 基于 KANO 模型的老年洗浴座椅的研究 ..... 宋志源等(43)  
高墩连续刚构桥 0 号块托架预压技术研究 ..... 戚佳飞等(46)  
软岩隧道底板隆起机理及微型桩防治研究 ..... 李和志等(49)  
基于量产德国某大型立式加工中心需求对滑座安装工装的设计 ..... 单华强等(52)  
DN3000 原水干管顶管施工对高铁桥梁的影响分析 ..... 陈雪虎(55)  
德胜大桥 T 型刚构加固工艺及加固后监控成果分析 ..... 杨智取等(58)  
虎跳峡金沙江大桥索塔上横梁支架施工方案比选 ..... 胡俊等(61)  
超超临界机组配套启动锅炉性能提升优化升级技术研究 ..... 姜利连(64)  
轻质淤泥固化土技术在围垦区市政道路中的应用 ..... 王荣芳等(67)  
六轴双源制电力调车机车通风系统 ..... 苏天祺等(70)  
MEMS 三维角度传感器设计研究 ..... 周婷等(75)

大跨度桁架平面闸门静动力特性分析	孔剑 等(80)
隔震橡胶桥梁支座液压同步升顶更换施工技术研究	郑青梅 等(83)

\* 价值应用 \*

基于 BIM 的暖通安装深化设计分析	张越博(87)
静力加载条件下隧道碎石变形强度特性及二次破碎研究	冯超 等(90)
一种可自动浇水花架的设计与实现	唐瑜谦 等(97)
条盒透明纸热封工艺研究及其应用	卢文 等(100)
公路桥梁的日常养护与修复措施	柯芳(103)
冲压空气排气口气动噪声数值研究	崔永龙 等(106)
余热梯级回收技术应用于燃煤供热工业锅炉湿烟羽治理的可行性分析	王文强(110)
污水处理厂项目一柱一桩施工工艺研究	宋时雨(113)
某厂房工程施工安全管理中 BIM 技术的实际应用	黄毅(116)
关于城市建筑工程造价效益分配优化控制技术的研究	梁慧玲(119)
退化环境中多线激光雷达融合 IMU 的里程计改进方法	张旭 等(122)
基于互联网+时代背景下的智能外卖柜的设计与实现	汪小芬 等(125)
矿用中部槽焊接工艺数值模拟分析研究	陈兵 等(129)
建筑石膏对预制混凝土早期强度影响的研究	柴振波(132)
基于数字图像技术的建筑施工稳定性监测技术研究	林育芳 等(135)
面向科技创城的大数据数字视网膜技术应用与研究	尚德玲 等(139)
深基坑支护施工技术在建筑工程中的应用研究	魏国栋 等(142)
高温高湿环境下不同填料沥青胶浆高温性能影响因素的优劣性研究	陈新昌隆(145)
基于贝叶斯推断的威布尔型产品可靠性评估	何成铭 等(149)
浅析房屋加固改造施工技术的应用	陈任生(153)
大型发电机励磁调节系统研究	吴妮娜(156)
模糊综合评价法结合优序图法在房地产市场法评估中的应用	王有红(159)

\* 理论综述 \*

长三角与京津冀协同创新比较	田晶 等(166)
---------------	-----------

**郑重声明**

- 1、本刊所刊载内容未经书面许可,任何部分不得以任何形式翻印、转载、复制,及存储于检索系统,提供给公众或私人使用。
- 2、来稿在 15 个工作日内给予回复录用与否,若未收到回复信息,请来电咨询稿件进展。来稿正常刊登周期为 3 个月内,未录用者可自行处理。请勿一稿多投,不涉及保密、署名无争议,请作者自留底稿,恕不退稿。
- 3、编辑部对来稿文章标题、内容、参考文献等保留删修权,不同意删修的稿件请在来稿中声明。
- 4、本刊已许可相关期刊网站以数字化方式复制、汇编、发行、信息网络传播本刊全文。本刊支付的稿酬(或稿酬与作品审稿费、与作品样刊费相抵)已包含相关期刊网站著作权使用费,所有署名作者向本刊提交文章发表之行为视为同意上述声明。如有异议,请在投稿时说明,本刊将按作者说明处理。

**Value Engineering**  
**(VE)**  
 Fortnightly Issue  
 Started in 1982  
 Vol.41 No.9  
 (Sum No.647)  
 Published in Sep. 28, 2022

**Inscribed:** Yuan Baohua  
**General Counsel:** Guan Zaiyuan  
**Executive Editor-in-chief:**  
 Gao Zhibiao  
**Manager:**  
 Hebei Association for  
 Science and Technology  
**Sponsor:**  
 Hebei Institute of Technology  
 Economy and Modern Management

**Chief Editor's Department:**  
 Shi Rui  
**Editor:** Editorial Team of VE  
**Publisher:**  
 Magazine Publishing House of VE  
**Address:**  
 No.88 Huai'an Road, Shijiazhuang  
**Tel:** (0311) 87024742  
**E-mail:** vezzsbjb@163.com

**Printed by:**  
 Changling Printing Co., Ltd. Langfang  
**Distributor:** Shijiazhuang Post Office  
**Subscriptions:**  
 Chinese Local Post Office  
**Domestic Issue Code:** 18-2  
**Domestic Single Price:** ¥30.00  
**Overseas Single Price:** 30.00  
**Open Publishing**  
**ISSN 1006-4311**  
**CN 13-1085/N**

# CONTENTS

## VALUE MANAGEMENT

- 1 Research and Application on Reliability Technology Improvement of Forced Loss of Power Generation- I&C Equipment in Nuclear Power Plant ..... ZHAI Xin-wei,*et al.*
- 6 Discussion on Optimization and Innovation of Construction Organization and Management of Railway Business Line ..... FANG Xing-jun,*et al.*
- 10 Research on the Application of BIM Technology in Overseas Substation Construction Contract Performance ..... HU Kai-tuo,*et al.*
- 13 Research on Improvement Measures of EPC Project Management Performance ..... ZHU Yue-liang,*et al.*
- 16 Comparison and Selection of Cold and Heat Source Solutions for MGM Resorts Nanjing ..... LI Han
- 19 Comparison and Discussion on Cost Optimization of Construction Scheme Using "Freezing Method" for a Subway Connecting Passage ..... XIANG Shu-fan
- 22 Performance Evaluation of Listed Computer Equipment Companies in China Based on Factor Analysis and Cluster Analysis ..... GUO Yue,*et al.*
- 27 Study on Evaluation and Optimization Strategy of Intensive Utilization of Urban Construction Land in Tianchang City ..... LIU Yang-bing,*et al.*
- 30 Procurement Strategy of Energy Efficiency Transformer under "Carbon Perspective" ..... LIU Hai-zhen,*et al.*
- 33 Research on Construction Quality Control and Progress Control of Construction Engineering ..... WANG Chun,*et al.*
- 36 Research Progress and Hot Spot Analysis of Carbon Emission from Agricultural Land under Goals of Carbon Peak and Carbon Neutrality ..... ZHANG Ai-qian,*et al.*

## VALUE CHAIN·SUPPLY CHAIN

- 40 Research on Information Sharing of Agricultural Product Supply Chain Based on AHP-fuzzy Comprehensive Analysis ..... ZAN Lin-jia

## FUNCTION CARRIER INNOVATION

- 43 Research on the Elderly Bathing Seat Based on KANO Model ..... SONG Zhi-yuan,*et al.*
- 46 Research on Preloading Technology of 0# Block Bracket for High Pier Continuous Rigid Frame Bridge ..... QI Jia-fei,*et al.*
- 49 Research on Uplift Mechanism of Soft Rock Tunnel Floor and Micro-pile Prevention and Control ..... LI He-zhi,*et al.*
- 52 Design of Sliding Seat Installation Tooling Based on the Demand for Mass Production of a Large Vertical Machining Center in Germany ..... SHAN Hua-qiang,*et al.*
- 55 Impact Analysis of DN3000 Raw Water Main Pipe Jacking Construction on High-speed Railway Bridge ..... CHEN Xue-hu

58 Reinforcement Technology of T-shaped Rigid Frame of Desheng Bridge and Analysis of Monitoring Results after Reinforcement	YANG Zhi-qu, <i>et al.</i>
61 Comparison and Selection of Construction Schemes for the Beam Support on the Cable Tower of Tiger Leaping Gorge Jinshajiang Bridge	HU Jun, <i>et al.</i>
64 Research on Optimization and Upgrading Technology of Supporting Start-up Boilers for Ultra-supercritical Units	JIANG Li-lian
67 Application of Light Sludge Solidified Soil Technology in Municipal Roads in Reclamation Area	WANG Rong-fang, <i>et al.</i>
70 Ventilation System of Six Axle Double Source Electric Shunting Locomotive	SU Tian-qi, <i>et al.</i>
75 Design and Research of MEMS Three-dimensional Angle Sensor	ZHOU Yu, <i>et al.</i>
80 Static and Dynamic Characteristics Analysis of Large Span Truss Gate	KONG Jian, <i>et al.</i>
83 Research on Construction Technology of Hydraulic Synchronous Lifting and Replacing of Seismic Isolation Rubber Bridge Bearings	ZHENG Qing-mei, <i>et al.</i>

## VALUE APPLICATION

87 BIM-based In-depth Design Analysis of HVAC Installation	ZHANG Yue-bo
90 Study on Deformation Strength Characteristics and Secondary Crushing of Tunnel Gravel under Static Loading	FENG Chao, <i>et al.</i>
97 Design and Implementation of an Automatic Flower Watering Sprinkler	TANG Yu-qian, <i>et al.</i>
100 Study and Application of Bar-box Transparent Paper Heat Seal Process	LU Wen, <i>et al.</i>
103 Daily Maintenance and Repair Measures of Highway Bridges	KE Fang
106 Numerical Investigation on Aerodynamic Noise of Ram Air Outlet	CUI Yong-long, <i>et al.</i>
110 Feasibility Analysis of Waste Heat Cascade Recovery Technology Applied to Wet Plume Control of Coal-fired Heating Industrial Boilers	WANG Wen-qiang
113 Study on Construction Technology of One Column One Pile in Sewage Treatment Plant Project	SONG Shi-yu
116 Practical Application of BIM Technology in a Workshop Project Construction Safety Management	HUANG Yi
119 Research on Optimal Control Technology of Urban Construction Project Cost Benefit Distribution	LIANG Hui-ling
122 Improved Odometer Method for Multi-line Lidar Fusion IMU in Degraded Environment	ZHANG Xu, <i>et al.</i>
125 Design and Implementation of Intelligent Takeout Cabinet Based on Internet+ Era Background	WANG Xiao-fen, <i>et al.</i>
129 Research on Numerical Simulation Analysis of Welding Process of Mine Middle Slot	CHEN Bing, <i>et al.</i>
132 Study on Influence of Plaster of Building on the Early Strength of Precast Concrete	CHAI Zhen-bo
135 Research on Building Construction Stability Monitoring Technology Based on Digital Image Technology	LIN Yu-fang, <i>et al.</i>
139 Application and Research of Big Data Digital Retina Technology for Science and Technology City	SHANG De-ling, <i>et al.</i>
142 Application of Deep Foundation Pit Support Construction Technology in Construction Engineering	WEI Guo-dong, <i>et al.</i>
145 Study on the Advantages and Disadvantages of Factors Influencing the High Temperature Performance of Different Fillers Asphalt Mastic in High Temperature and Humidity Environment	CHEN Xin-changlong
149 Reliability Assessment of Weibull Products Based on Bayesian Inference	HE Cheng-ming, <i>et al.</i>
153 Brief Analysis on the Application of Construction Technology of House Reinforcement and Reconstruction	CHEN Ren-sheng
156 Research on Excitation Regulation System of Large Generator	WU Ni-na
159 Application of Fuzzy Comprehensive Evaluation Method Combined with Optimal Sequence Diagram Method in Evaluation of Real Estate Market Method	WANG You-hong

## THEORETICAL REVIEW

166 Comparison of Collaborative Innovation between Yangtze River Delta and Beijing-Tianjin-Hebei Region	TIAN Jing, <i>et al.</i>
---	--------------------------