

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

2023 8

上旬刊（总第 678 期 / 第 42 卷）

# 价值工程

ISSN 1006-4311



9 771006 431068

# 价值工程

2023年8月上旬刊 (总第678期 / 第42卷)  
1982年创刊 2023年8月8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：朱敏行 马慧霞 师瑞

电 话：0311-87024742

编辑部：王志增 赵亚平 刘兴菊

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 \*

- 战略性新兴产业融合集群发展的关键影响因素分析 ..... 梁辰等(1)  
BIM5D 在基坑工程施工中的动态管理措施 ..... 杨涛(4)  
基于工作流技术的软件测试标准化管理工具的研究 ..... 梁博成等(7)  
EPC 模式下装配式建筑的成本评价与管理研究 ..... 陈雪清(10)  
基于遗传算法的施工人员配置优化 ..... 王建芹(13)  
数码电子雷管爆破开挖造价研究 ..... 罗燕(16)  
预算管理在酿酒企业中的运用研究 ..... 刘建镔(19)  
基于 AHP-FCE 的废弃露天矿坑综合利用潜力评估 ..... 赵耀等(22)  
基于 Shapley-value 法的联盟利益分配研究 ..... 叶卫正等(25)  
石化项目数字化交付的探索与管理实践 ..... 王彦臣(28)  
浙江省网络货运发展现状评估与对策分析 ..... 程红等(31)  
煤炭企业内部市场化管理的探索与实践 ..... 王宏刚(34)  
城市燃气企业生产技能人员胜任能力评价研究 ..... 赵亮等(37)  
基于安全保障的高速现浇箱梁施工关键技术分析 ..... 丘坤强(40)  
中老铁路通车后对滇老贸易货运市场的影响研究 ..... 马蓉等(44)  
智慧交通驱动下的绍兴智能网联产业加速发展研究 ..... 于力等(48)  
绿色发展背景下江苏省生态环境治理绩效提升路径研究

..... 曹艳秋等(51)

某地铁上盖项目工程规划设计 ..... 程乙平(54)

## \* 价值链·供应链 \*

- “双碳”目标下轨道交通绿色数智化供应链风险综合评估研究  
..... 彭家辉等(59)

## \* 功能载体创新 \*

- 复杂环境下超大断面隧道开挖类 CD 法施工技术研究 ..... 刘新(63)  
连退机组焊接质量影响因素研究与工艺改进 ..... 姚建华等(66)  
复杂地层条件下盾构下穿既有隧道工程研究 ..... 郭玮卿(69)  
连续刚构桥空心薄壁墩布置研究 ..... 宋若雨(72)  
城市轨道交通供电系统加装无功补偿装置技术应用 ..... 马静(75)  
某医疗综合楼项目深基坑支护设计优化 ..... 陈国权等(78)  
新发展格局下广东引领泛珠三角区域经济发展与要素流通研究  
..... 杨韵(81)  
巨厚煤层变薄区槽波地震勘探技术 ..... 吴章涛等(84)  
大藤峡水利枢纽工程右岸厂房进水口闸门一期直埋施工技术  
..... 曾文专(87)

浅析武山县西秦岭基岩山区供水保障工程设计	李志刚(90)
新型客货共线预制箱梁预应力施工技术	宁锴(93)
选煤厂溜槽设计改造应用实践	李彪(96)
养护台车在高原隧道衬砌施工中的应用及研究	陈朝雄(99)
矿用高强度D级链条关键技术及生产工艺方法的研究	丁瑜荣等(102)
邻近既有线浅埋偏压隧道控爆开挖施工技术	张枝梅(105)

\* 价值应用 \*

电线电缆外套耐刮试验机校准方法和影响分析	马兴(108)
冷表面水分子结霜机理的分子动力学模拟研究	李一等(111)
临江大道-阅江路隧道钢壳沉管结构主体造价构成分析	付亮玲(114)
既有桥梁抗震性能提升关键技术研究	吕士军(117)
川东北河坝区块石油钻井工艺技术研究	张俊波(122)
采煤系统智能化改造建设与成效研究	邓强(125)
重型柴油机DPF中二氧化氮对碳载量的影响研究	高旺等(128)
基于S7-200SMART PLC的智慧牛舍环境监测系统的研究	张晓霞等(131)
几何误差测量方法应用分析	徐奎照(134)
基于FLAC <sup>3D</sup> 的巷道支护方案选择与优化	张铭浩(137)
住宅建筑供热能耗分析与节能策略研究	张超强(140)
低空多旋翼无人机在非洲矿山测量中的应用	徐志新等(143)
BIM+GIS+IOT技术在安九铁路数字工地的运用研究	刘力(147)
基于非零应矩理论的钢筋混凝土梁下挠分析	车野等(150)
护岸冲刷深度计算及其计算结果应用研究	刘晖(153)
新型测绘技术在地籍总调查测量中应用	刘加敏等(156)
隔离型Boost全桥变换器的关键问题研究	冒冬琴等(159)

\* 工业工程 \*

小型电机装配车间双排生产线布局优化	万安定等(163)
-------------------	-----------

\* 综合 \*

“双碳”背景下中国新能源汽车产业链发展研究	宋晓明等(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，请来信来电咨询稿件进展。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.42 8.a  
 (Sum No.678)  
 Published in Aug. 8, 2023

**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:** vezzshjb@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 Analysis on Key Factors to Integrated Clustering Development of Strategic Emerging Industries .....   | LIANG Chen, <i>et al.</i>     |
| 4 Dynamic Management Measures of BIM5D in Foundation Pit Engineering Construction .....   | YANG Tao                      |
| 7 Research on Software Test Standardization Management Tool Based on Workflow .....   | LIANG Bo-cheng, <i>et al.</i> |
| 10 Research on Cost Evaluation and Management of Prefabricated Buildings under EPC Project .....  | CHEN Xue-qing                 |
| 13 Optimization of Water Conservancy Construction Personnel Allocation Based on Genetic Algorithm .....   | WANG Jian-qin                 |
| 16 Research on the Excavation Cost of Digital Electronic Detonator Blasting .....   | LUO Yan                       |
| 19 Research on the Application of Budget Management in Brewery Enterprises .....  | LIU Jian-bin                  |
| 22 Comprehensive Utilization Potential Assessment of Abandoned Open Pit Based on AHP-FCE .....  | ZHAO Yao, <i>et al.</i>       |
| 25 Benefit Distribution of Strategic Alliance Based on Shapley-value Method .....   | YE Wei-zheng, <i>et al.</i>   |
| 28 Exploration and Management Practice of Digital Delivery in Petrochemical Projects .....  | WANG Yan-chen                 |
| 31 Evaluation of the Current Situation of Network Freight Development in Zhejiang Province and Countermeasures Analysis .....                       | CHENG Hong, <i>et al.</i>     |
| 34 Exploration and Practice of Internal Marketization Management in Coal Enterprises .....  | WANG Hong-gang                |
| 37 Research on the Competency Evaluation of Production Skilled Personnel in Urban Gas Enterprises .....   | ZHAO Liang, <i>et al.</i>     |
| 40 Analysis on the Key Technology of High-speed Cast-in-place Box Girder Construction Based on Safety Guarantee .....                               | QIU Kun-qiang                 |
| 44 Research on the Impact of the Opening of China-Laos Railway on the Yunnan-Laos Trade Freight Market .....  | MA Rong, <i>et al.</i>        |
| 48 Research on the Accelerated Development of Shaoxing's Intelligent Connected Industry Driven by Intelligent Transportation .....                  | YU Li, <i>et al.</i>          |
| 51 Research on the Improvement Path of Eco-environmental Governance Performance in Jiangsu Province under the Background of Green Development ..... | CAO Yan-qiu, <i>et al.</i>    |
| 54 Planning and Design of a Subway Cover Project .....  | CHENG Yi-ping                 |

## VALUE CHAIN·SUPPLY CHAIN

- |  |                             |
|--|-----------------------------|
| 59 Study on Comprehensive Risk Assessment of Green Digital Intelligence Supply Chain of Rail Transit under the Goal of "Peak Carbon Dioxide Emissions and Carbon Neutrality" ..... | PENG Jia-hui, <i>et al.</i> |
|--|-----------------------------|

## FUNCTION CARRIER INNOVATION

- |   |                             |
|---|-----------------------------|
| 63 Study on CD Like Construction Technology of Super Large Section Tunnel Excavation in Complex Environment ..... | LIU Xin                     |
| 66 Study on Influence Factors of Welding Quality and Process Improvement of Continuous Annealing Unit .....       | YAO Jian-hua, <i>et al.</i> |

69 Research on Shield Tunneling Through Existing Tunnels under Complex Geological Conditions .....	GUO Wei-qing
72 Study on the Layout of Thin-wall Piers of Continuous Rigid Frame Bridge .....	SONG Ruo-yu
75 Application of Reactive Power Compensation Device in Urban Rail Transit Power Supply System .....	MA Jing
78 Optimization of Deep Foundation Pit Support Design for a Medical Complex Building Project .....	CHEN Guo-quan, <i>et al.</i>
81 Research on Guangdong Promoting Regional Synergy and Factors Circulation in Pan Pearl River Delta under the New Development Paradigm .....	YANG Yun
84 Channel Wave Seismic Exploration Technology in the Thinning Area of Extremely Thick Coal Seams .....	WU Zhang-tao, <i>et al.</i>
87 Direct Burial Construction Technology for the First Phase of the Intake Gate of the Right Bank Factory Building of the Datengxia Water Control Project .....	ZENG Wen-zhuan
90 Analysis of the West Qinling Bedrock Mountain Water Supply Guarantee Project in Wushan County .....	LI Zhi-gang
93 Prestressed Construction Technology of New Type Prefabricated Box Girder with Passenger and Freight Lines .....	NING Kai
96 Application Practice of Design and Transformation of Chute in Coal Preparation Plant .....	LI Biao
99 Application and Research of Concrete Curing Equipment in Tunnel Lining Construction of Plateau Environment .....	CHEN Zhao-xiong
102 Research on Key Technologies and Production Process Methods of Mining High Strength D-grade Chain .....	DING Yu-rong, <i>et al.</i>
105 Construction Technology of Controlled Explosion Excavation of Shallow Buried Biased Pressure Tunnel Near the Existing Line .....	ZHANG Zhi-mei

### VALUE APPLICATION

108 Calibration Method of Wiper Tester for Wire and Cable Sheath .....	MA Xing
111 Simulation of Frost Formation Mechanism on Cold Surface in Molecular Dynamics Method .....	LI Yi, <i>et al.</i>
114 Analysis on Main Cost Composition of Steel Shell Submerged Tube Structure of Linjiang Avenue–Yuejiang Road Tunnel .....	FU Liang-ling
117 Overview of Seismic Performance Improvement Technology for Existing Bridges .....	LYU Shi-jun
122 Research on Petroleum Drilling Technology in Heba Block of Northeast Sichuan .....	ZHANG Jun-bo
125 Research on the Construction and Effectiveness of Intelligent Transformation of Coal Mining System .....	DENG Qiang
128 Research on the Effect of NO <sub>2</sub> on Carbon Load in Heavy Duty Diesel Engine DPF .....	GAO Wang, <i>et al.</i>
131 Research on Intelligent Cowshed Environmental Monitoring System Based on S7-200SMART PLC .....	ZHANG Xiao-xia, <i>et al.</i>
134 Analysis of the Application of Geometric Error Measurement Methods .....	XU Kui-zhao
137 Selection and Optimization of Tunnel Support Schemes Based on FLAC <sup>3D</sup> .....	ZHANG Ming-hao
140 Analysis of Heating Energy Consumption and Research on Energy Saving Strategies for Residential Buildings .....	ZHANG Chao-qiang
143 Application of Low-altitude Multirotor UAV in Mine Survey in Africa .....	XU Zhi-xin, <i>et al.</i>
147 Research on the Application of BIM+GIS+IOT Technology in the Digital Construction Site of Anjiu Railway .....	LIU Li
150 Downwarping Analysis of Reinforced Concrete Beams Based on Non-zero Point Force Moment Elasticity Theory .....	CHE Ye, <i>et al.</i>
153 Research on the Calculation of Bank Protection Scouring Depth and the Application of Calculation Results .....	LIU Hui
156 Application of New Surveying and Mapping Technology in Cadastral Survey and Measurement .....	LIU Jia-min, <i>et al.</i>
159 Research on the Key Questions of Isolated Boost Full Bridge Converter .....	MAO Dong-qin, <i>et al.</i>

### IE

163 Optimization of Double-row Production Line Layout in Small Motor Assembly Workshop .....	WAN An-ding, <i>et al.</i>
--	----------------------------

### COMPREHENSION

166 Research on the Development of China's New Energy Vehicle Industry Chain under the Background of "Peak Carbon Dioxide Emissions and Carbon Neutrality" .....	SONG Xiao-ming, <i>et al.</i>
--	-------------------------------



# 致敬盛世脊梁



# 96



—热烈庆祝中国人民解放军—

建军96周年