

Leadership Style as a Determinant of Quality Orientation in Industrial Enterprises: Evidence from the Mining Sector Context

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Abstract

Quality policy is a fundamental element of organizational management, influencing process performance, customer satisfaction, and the development of a quality-oriented organizational culture. Leadership style is regarded as an important determinant of managerial practices that may support or hinder the implementation of quality management principles. This study aimed to investigate the relationship between quality orientation and leadership style in industrial enterprises, using the mining industry as the theoretical context because of its specific quality management challenges. The study combined a literature review with an empirical survey conducted among 274 industrial enterprises operating in Poland. The study assessed quality orientation using a proprietary questionnaire comprising 35 organizational practices reflecting Total Quality Management principles, while identifying leadership styles using the Organizational Culture Assessment Instrument (OCAI) based on the Competing Values Framework. The statistical analysis employed two complementary approaches. First, enterprises were grouped according to their dominant leadership style, and differences in quality orientation were examined using the Kruskal–Wallis test followed by Dunn's post hoc test. Second, Spearman's rank correlation analysis evaluated the relationships between the intensity of each leadership style and quality orientation across the entire sample. The results demonstrated significant differences in quality orientation between leadership-style groups. Enterprises characterized by an adhocracy leadership style achieved the highest quality orientation, whereas market-oriented organizations obtained the lowest scores. Dunn's test indicated significant differences only between the market-oriented group and the remaining groups. Correlation analysis revealed positive relationships between quality orientation and clan and adhocracy leadership styles, a moderate negative relationship with market leadership style, and no statistically significant relationship with hierarchy leadership style. The findings indicate that leadership promoting cooperation, flexibility, and employee involvement provides more favorable conditions for developing a quality-oriented organizational culture than leadership primarily focused on competitiveness and short-term performance.

Keywords

quality policy; quality orientation; leadership style; organizational culture; Competing Values Framework; industrial enterprises.



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Introduction

Managing contemporary enterprises is becoming increasingly challenging despite the support provided by modern technologies. Today's business environment is characterized by rapidly changing market conditions, technological innovation, globalization, and continuously increasing customer expectations. At the same time, managers must address numerous internal challenges, including information overload, the growing complexity of remote and hybrid work, and the increasing importance of protecting employees' mental well-being. Building an organizational culture based on shared values and mutual trust to enhance employee engagement and organizational performance has therefore become a key managerial challenge.

The mining industry is among the sectors most exposed to regulatory, environmental, and social pressures. In addition to addressing challenges related to digital transformation, decarbonization, and workforce shortages, mining enterprises must also manage issues arising from the specific characteristics of extraction processes, including high operational risk, changing geological conditions, and stringent safety requirements. Consequently, managing mining enterprises is generally more complex than managing organizations operating in most other manufacturing sectors.

In such a demanding environment, organizations need not only a well-defined and effectively implemented business strategy but also coherent management policies and an appropriate leadership approach that supports long-term organizational development. One key element influencing organizational performance is the quality policy. However, a quality policy's effectiveness depends not only on its formal definition but, above all, on its consistent implementation throughout the organization. This requires managerial competencies that enable leaders to create an organizational culture oriented toward continuous improvement and to adopt leadership styles that effectively support quality management principles.

This paper presents the results of both a literature review and an empirical study concerning leadership styles and quality management in industrial enterprises, with particular reference to the mining industry as the theoretical context of the research. The empirical study was based on a questionnaire survey conducted among 274 industrial enterprises operating in Poland. The primary objective of the research was to evaluate quality orientation in relation to organizational culture, with particular emphasis on the dominant leadership style adopted within each organization. Statistical analyses were performed using two complementary approaches. First, enterprises were grouped by dominant leadership style, enabling comparisons of quality orientation across leadership-style groups. Second, correlation analysis examined relationships between the intensity of individual leadership styles and the level of quality orientation across the entire sample.

Although the mining industry provides the theoretical context for this study because of its specific quality management challenges, the empirical analysis was intentionally conducted on a broader sample of industrial enterprises to identify more general relationships between leadership style and quality orientation. This approach was adopted because many organizational processes, including quality management, maintenance management, logistics, supply chain management, and continuous improvement, rely on similar management principles across industrial sectors, allowing the results to be interpreted in a broader industrial context.

Despite the growing body of research on quality management and leadership, empirical studies that simultaneously examine the relationship between quality orientation and dominant leadership styles in industrial enterprises remain limited, particularly in industries facing complex operational and organizational challenges. This study aims to address this research gap.

2. Literature Review

2.1. Quality Policy and Quality Orientation

Quality policy may be understood as the general course of action adopted by an organization's decision-making body to achieve strategic objectives through coordinated managerial activities. Consequently, an organization's quality policy should be derived directly from its mission, vision, and business strategy. According to ISO 9000, a quality policy is defined as an organization's overall intentions and direction related to quality, formally expressed by top management. As such, it provides the foundation for establishing quality objectives, designing process structures, and developing organizational standards that guide quality management activities.

A well-defined quality policy extends beyond a formal declaration. It determines managerial practices, employee behavior, and the practical implementation of quality management principles throughout the organization. Consequently, it influences organizational reputation, stakeholder confidence, and long-term business performance (Molenda, 2009; Molenda, 2015; Molenda, 2019). Therefore, formulating and consistently implementing an appropriate quality policy is one of the key managerial responsibilities within quality management systems compliant with ISO 9001 (Midor, 2013; Mourougan & Sethuraman, 2017; Pacana & Ulewicz, 2020).

Despite its strategic importance, quality policy is frequently perceived in managerial practice merely as a formal document required for certification purposes. This approach considerably limits its managerial significance

and reduces its contribution to developing a quality-oriented organizational culture (Miller et al., 2014). Contemporary quality management literature emphasizes that sustainable organizational excellence cannot be achieved solely through formal compliance with management system requirements. Instead, organizations should develop a culture in which quality constitutes a shared organizational value, consistent with the principles of Total Quality Management (Calvo-Mora et al., 2014; Chen et al., 2016; Sharma et al., 2013; Silva et al., 2014).

In the mining industry, quality policy can be considered at two complementary levels. The first concerns mining enterprises themselves, where quality management supports extraction processes, operational reliability, occupational safety, and environmental protection. The second relates to the broader mining supply chain, including equipment manufacturers, technical service providers, logistics operators, laboratories, mineral processing facilities, and suppliers of materials and consumables. At both levels, certified quality management systems have become widely adopted instruments for improving process consistency and organizational performance (Kitsopoulos et al., 2001).

Within mining enterprises, quality policy is closely integrated with occupational health and safety, environmental management, and the reliability of mining operations. In practice, this involves standardizing mining processes, monitoring raw material quality, maintaining mining equipment (Bialy et al., 2026), documenting inspection and testing activities, and conducting systematic internal audits. Particular attention is devoted to ensuring consistent product quality by maintaining stable physical and chemical characteristics of extracted raw materials in accordance with customer requirements and applicable standards. Previous studies indicate that effective quality management systems improve customer satisfaction, process performance, and reduce non-conformities and operational waste within mining organizations (Seifullina et al., 2018).

Quality policy in mining-related industries places greater emphasis on supply chain stability, product and technical service quality, and compliance with customer requirements (Zajac & Zajac, 2010). This applies particularly to manufacturers of mining equipment, maintenance and service companies, laboratories, transportation providers, suppliers of operational materials, and mineral processing enterprises. In these organizations, effective quality management depends primarily on supplier evaluation, incoming material inspection, supervision of service processes, personnel competence, and comprehensive documentation demonstrating product and service conformity (Wittbrot et al., 2026).

Given the specific characteristics of mining operations, the quality policy should support operational stability, process reliability, occupational safety, legal compliance, and customer satisfaction while promoting continuous improvement. It should also address the industry's high operational risk by emphasizing equipment reliability, supply quality, process standardization, and integrating quality management with environmental and occupational health and safety management systems (Givano & Sholichah, 2019; Teplicka et al., 2026; Knop, 2026).

2.2. Leadership Styles and Their Role in Shaping Quality Orientation

Leadership has long been recognized as a fundamental determinant of organizational effectiveness. The concepts of leadership, leader, and leadership style are closely interrelated and constitute the basis for understanding managerial behavior within organizations. According to Northouse (2018), leadership is a process through which an individual influences a group to achieve a common goal. Similarly, Maxwell (2019) emphasizes that leadership is primarily the ability to influence and inspire others regardless of formal authority. Consequently, leadership style may be understood as a relatively stable pattern of managerial behaviors through which leaders influence employees, make decisions, and shape organizational culture (Żukowski & Galla, 2009; Podlowska, 2016).

The scientific study of leadership has evolved considerably over the past century. Early leadership research focused mainly on identifying personal characteristics that distinguished effective leaders. Subsequently, attention shifted toward behavioral approaches, beginning with the classical distinction between autocratic, democratic, and laissez-faire leadership styles proposed by Lewin et al. (1939). Later studies showed that leadership effectiveness depends not only on personal characteristics but also on managerial behavior and employee participation in decision-making. Tannenbaum and Schmidt (1958) introduced leadership as a behavioral continuum, while Likert (1961) distinguished four management systems that differed in the degree of employee involvement. Blake and Mouton (1964) further developed behavioral theories by proposing the Managerial Grid, emphasizing the balance between concern for people and concern for production.

A significant breakthrough in leadership research occurred with the development of contingency and situational theories. Fiedler's (1967) Contingency Model showed that no single leadership style is universally effective and that leadership performance depends on the fit between a leader's natural style and situational conditions. Similar assumptions underpin McGregor's (1960) Theory X and Theory Y, Hersey and Blanchard's (1969) Situational Leadership Theory, Reddin's (1970) three-dimensional management theory, and House's (1971) Path-Goal Theory. Collectively, these approaches established that effective leadership requires flexibility and adaptation to organizational circumstances rather than adherence to a single managerial style.

Contemporary leadership theories increasingly emphasize leaders' ability to inspire organizational learning, innovation, and employee engagement. Transformational leadership, introduced by Bass and Avolio (1994), highlights the leader's capacity to influence organizational values and motivate employees beyond formal organizational requirements. Similarly, Goleman (2000) demonstrated that emotionally intelligent leadership positively affects organizational climate, particularly through visionary, coaching, affiliative, and democratic leadership styles. More recent studies indicate that effective leadership increasingly relies on trust, collaboration, emotional intelligence, and employee empowerment rather than command-and-control management (Hougaard & Carter, 2018; Covey, 2022). This evolution reflects broader socio-economic transformations and the growing complexity of organizational environments, requiring leadership approaches that balance organizational performance with employee well-being and continuous learning (Kuzior et al., 2023).

The relationship between leadership style and quality management has received increasing attention within the quality management literature. Numerous studies suggest that leadership is a critical success factor in implementing Total Quality Management principles and developing a quality-oriented organizational culture. Rehan et al. (2016) demonstrated positive relationships between transformational and transactional leadership styles and quality management practices in small and medium-sized enterprises. Similarly, Kumar and Sharma (2017) reported statistically significant relationships between leadership styles applied in managerial problem-solving and organizational commitment to continuous improvement and innovation. Their findings indicate that successful implementation of Total Quality Management requires managerial flexibility rather than reliance on a single dominant leadership style.

Leadership style is also closely associated with organizational culture. Managers not only shape organizational culture through their leadership behavior but are simultaneously influenced by the cultural context in which they operate. Consequently, leadership effectiveness depends on the consistency between managerial behavior, organizational values, and employee expectations (Korycka & Pluciński, 2019). Peña-Acuña (2017) further argues that no universally optimal leadership style exists, as organizational context, strategic objectives, and workforce characteristics determine leadership effectiveness.

The mining industry constitutes a distinctive organizational environment in which leadership is influenced by operational risk, stringent safety regulations, technological complexity, and strong organizational traditions. Historically, mining organizations have been characterized by hierarchical, authoritarian leadership structures shaped by centralized decision-making and rigorous occupational safety requirements. At the same time, increasing automation, digital transformation, environmental challenges, and demographic changes have accelerated the shift toward more participative, knowledge-based management approaches. Contemporary mining organizations increasingly combine procedural discipline with employee involvement, interdisciplinary collaboration, and continuous improvement initiatives inspired by Lean Mining principles (Seifullina et al., 2018).

Consequently, effective leadership in mining enterprises increasingly depends on the ability to adapt managerial behavior to organizational circumstances. Participative and consultative leadership approaches are particularly valuable in strategic planning, innovation management, and interdisciplinary problem-solving, whereas directive leadership remains indispensable in operational environments requiring immediate decision-making, procedural compliance, and strict safety control. This situational perspective suggests that leadership effectiveness in mining organizations comes not from adhering to a single management style but from balancing flexibility, employee engagement, operational reliability, and safety requirements.

2.3. Leadership in the Mining Industry

The mining industry is one of the most demanding organizational environments for management and leadership. Mining enterprises operate under conditions characterized by high operational risk, stringent legal regulations, technological complexity, hazardous working environments, and increasing social and environmental expectations. Consequently, leadership in mining organizations must simultaneously ensure operational efficiency, occupational safety, regulatory compliance, and long-term organizational sustainability.

Historically, leadership in mining has been dominated by hierarchical and directive management approaches. The high-risk nature of underground and surface mining operations, together with strict occupational health and safety regulations, has traditionally required centralized decision-making, clearly defined responsibilities, and rigorous procedural discipline. Under such conditions, leadership effectiveness has often depended on rapid decision-making, precise communication, and strict compliance with operational procedures.

Another characteristic feature of mining organizations is their high level of organizational formalization. Mining companies operate within extensive systems of technical standards, legal regulations, and management procedures governing extraction processes, environmental protection, occupational safety, equipment maintenance, and product quality. Consequently, bureaucratic and hierarchical management mechanisms remain essential to organizational effectiveness, ensuring process stability, operational reliability, and regulatory compliance.

However, the mining industry has undergone substantial transformation during the last two decades. Digitalization, automation, remote monitoring systems, predictive maintenance, artificial intelligence, and advanced process control have significantly increased organizational complexity. At the same time, decarbonization policies, environmental regulations, workforce shortages, and demographic changes have created new managerial challenges beyond traditional production management.

These developments have gradually shifted leadership practices toward more participative and knowledge-oriented approaches. Contemporary mining enterprises increasingly rely on interdisciplinary teams, engineering expertise, employee engagement, and organizational learning to improve operational performance while maintaining high safety standards. Lean Mining initiatives and continuous improvement programs have further strengthened the importance of collaboration, knowledge sharing, and employee participation in solving operational problems (Seifullina et al., 2018).

The evolution of quality management has also influenced leadership practices within mining organizations. Modern quality management systems are no longer limited to product inspection or procedural compliance but increasingly support organizational learning, process optimization, risk management, and continuous improvement. Consequently, leadership plays an essential role in integrating quality management principles with occupational safety, environmental management, maintenance strategies, and operational excellence throughout the organization (Kitsopoulos et al., 2001; Givano & Sholichah, 2019).

From a leadership perspective, mining organizations increasingly apply situational management principles. Participative and consultative leadership styles are particularly appropriate for strategic planning, innovation management, engineering projects, and organizational change, where knowledge sharing and interdisciplinary cooperation are essential. Conversely, directive leadership remains indispensable in operational situations requiring immediate responses, strict procedural compliance, and rapid decision-making under hazardous conditions. Effective mining managers therefore combine different leadership behaviors depending on organizational context, operational risk, and decision-making requirements.

This coexistence of hierarchical structures with participative management practices makes the mining industry an especially valuable theoretical context for investigating relationships between leadership style and quality orientation. Although mining enterprises possess several sector-specific characteristics, many organizational processes—including quality management, maintenance management, logistics, production planning, and continuous improvement—are based on universal management principles common to industrial organizations. For this reason, the mining industry provides an appropriate theoretical framework for analyzing leadership and quality management while allowing empirical relationships to be investigated using a broader sample of industrial enterprises.

2.4. Research Gap and Hypotheses

2.4.1. Research Gap.

Although numerous studies have examined quality management, organizational culture, and leadership styles separately, considerably fewer investigations have explored the direct relationship between organizational quality orientation and dominant leadership styles within industrial enterprises. Existing research has primarily focused on specific leadership concepts, such as transformational or transactional leadership, or has analyzed leadership as one of many determinants of Total Quality Management implementation (Rehan et al., 2016; Kumar & Sharma, 2017).

Moreover, previous studies have generally focused on identifying relationships between leadership and selected quality management practices rather than evaluating the overall level of quality orientation across organizations characterized by different organizational cultures and leadership profiles. Consequently, empirical evidence comparing quality orientation across organizations representing different dominant leadership styles remains limited.

This research gap is particularly evident in industries characterized by high operational complexity, such as mining. The mining sector has unique organizational characteristics, including strict safety requirements, hierarchical structures, extensive procedural formalization, and increasing technological complexity. These conditions make leadership particularly important for balancing operational reliability, employee engagement, and continuous improvement. Nevertheless, empirical studies that simultaneously examine organizational quality orientation and leadership styles in the broader industrial context remain scarce.

To address this gap, the present study investigates the relationship between organizational quality orientation and dominant leadership styles identified using the Organizational Culture Assessment Instrument (OCAI). Rather than focusing exclusively on mining enterprises, the empirical investigation was conducted on a broader sample of industrial organizations. This approach enables the identification of general relationships applicable across industrial sectors while keeping the mining industry as the theoretical context because of its distinctive managerial challenges.

2.4.2. Research Hypotheses

Based on the reviewed literature, the following research hypotheses were formulated:

- H1. There are statistically significant differences in the level of quality orientation among industrial enterprises representing different dominant leadership styles.
Rationale: Previous studies suggest that leadership behavior influences organizational culture and the implementation of quality management principles. Therefore, organizations with different dominant leadership styles may show different levels of quality orientation.
- H2. Leadership styles emphasizing employee involvement and organizational flexibility (Clan and Adhocracy) are positively associated with organizational quality orientation.
Rationale: Participative and transformational leadership approaches foster employee engagement, organizational learning, continuous improvement, and customer orientation, which constitute fundamental principles of Total Quality Management.
- H3. Leadership styles emphasizing competitiveness and short-term performance (Market culture) are negatively associated with organizational quality orientation.
Rationale: Excessive focus on external competition and short-term organizational performance may reduce managerial attention devoted to continuous improvement and long-term quality development.
- H4. Hierarchy-oriented leadership is not significantly associated with organizational quality orientation.
Rationale: Although hierarchical management supports process stability and procedural compliance, previous studies provide inconsistent evidence regarding its influence on organizational quality culture. Consequently, no directional relationship is assumed.

3. Material and Methods.

3.1. Research Design.

Assessing an organization's quality policy presents a considerable methodological challenge because formally declared quality principles frequently differ from actual managerial practices. Consequently, evaluating quality policy requires examining the extent to which quality-oriented behaviors are implemented in everyday organizational activities rather than relying solely on official policy statements.

For this reason, the study adopted an anonymous questionnaire survey as the primary research method. Anonymous responses reduce the risk of socially desirable answers and provide a more reliable assessment of actual organizational practices and quality management behaviors.

The study was conducted between 2015 and 2025 among 274 industrial enterprises operating in Poland. Participation was voluntary, and organizations agreed to participate on the condition that all collected data would remain anonymous and be reported only in aggregated form.

The study's primary objective was to assess the degree of organizational quality orientation and examine its relationship with the dominant leadership style identified within each enterprise.

3.2. Research Instruments

3.2.1. Assessment of Quality Orientation

Quality orientation was measured using an original questionnaire developed by the authors based on Total Quality Management (TQM) principles and previous research on quality management systems. The questionnaire consisted of 35 organizational practices describing behaviors typically observed in organizations strongly oriented toward quality. These practices reflected key TQM principles, including customer orientation, leadership commitment, employee involvement, process management, continuous improvement, evidence-based decision-making, and organizational learning.

Respondents evaluated the extent to which each statement reflected the situation in their organization using a five-point Likert scale, where:

- 1 – the described practice is not characteristic of the organization;
- 5 – the described practice is fully characteristic of the organization.

The overall quality orientation score was calculated as the arithmetic mean of all questionnaire items. Higher values indicated a stronger implementation of quality-oriented organizational practices and, consequently, a higher level of organizational quality orientation.

3.2.2. Assessment of Leadership Style

The study assessed organizational culture using the Organizational Culture Assessment Instrument (OCAI) developed by Cameron and Quinn within the Competing Values Framework. Although the OCAI evaluates organizational culture across six organizational dimensions, the present study focused exclusively on the leadership style dimension because of its direct relevance to the research objective. For each enterprise, the OCAI generated a leadership profile with four percentage scores representing the intensity of the following leadership

styles: Clan, Adhocracy, Market, and Hierarchy. The dominant leadership style was identified as the culture type with the highest percentage score within the organizational profile. Accordingly, all enterprises were classified into one of four groups according to their dominant leadership style.

3.3. Statistical Analysis

The statistical analysis was designed to examine both differences in quality orientation between leadership-style groups and relationships between leadership-style intensity and organizational quality orientation. The data distribution was initially assessed using the Shapiro–Wilk normality test, and Levene's test evaluated homogeneity of variances. Because the assumptions of normality and homogeneity of variances were not fully met, we used non-parametric statistical methods. We examined differences in quality orientation among enterprises with different dominant leadership styles using the Kruskal–Wallis test. When statistically significant differences were identified, Dunn's post hoc test with Holm correction was performed to determine which groups differed significantly. In addition, Spearman's rank correlation coefficient was used to analyze relationships between the intensity of individual leadership styles (Clan, Adhocracy, Market, and Hierarchy) and organizational quality orientation. Statistical significance was assumed at $p < 0.05$ for all analyses.

4. Results

Descriptive statistics for the 274 surveyed industrial enterprises classified according to the dominant leadership style are presented in Table 1. The largest group comprised organizations characterized by the Market leadership style ($n = 79$), followed by Hierarchy ($n = 36$), Clan ($n = 31$), and Adhocracy ($n = 18$).

Tab. 1. Descriptive statistics for the surveyed groups of enterprises

Statistics	Clan leadership style	Adhocracy leadership style	Hierarchy leadership style	Market leadership style
Count	31	18	36	79
QO Mean	3,63	3,76	3,60	3,17
Standard Error	0,116	0,071	0,132	0,064
Median	3,69	3,77	3,805	3,17
Standard Deviation	0,647	0,303	0,794	0,567
Sample Variance	0,418	0,092	0,630	0,321
Minimum	2,06	3,12	1,89	1,68
Maximum	4,8	4,43	4,66	4,63
Confidence Level (95.0%)	0,237	0,150	0,269	0,127
Lower Bound	3,395	3,613	3,328	3,041
Upper Bound	3,870	3,914	3,865	3,295

The highest mean Quality Orientation (QO) score was observed among enterprises dominated by the Adhocracy leadership style ($M = 3.76$), followed by Clan ($M = 3.63$) and Hierarchy ($M = 3.60$). The lowest mean value was obtained for Market-oriented organizations ($M = 3.17$). The results are shown in Figure 1.

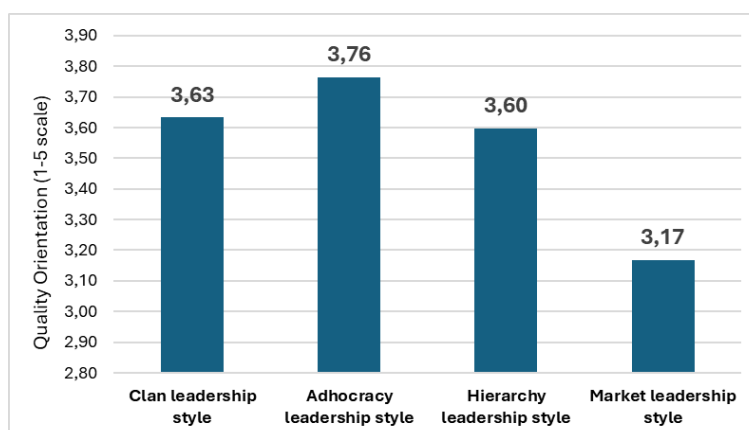


Figure 1. Comparison of quality orientation among 4 groups with different leadership styles.

Prior to group comparisons, the assumptions for parametric analysis were verified. The Shapiro–Wilk test indicated a significant deviation from normality only for the Hierarchy group ($W = 0.9321$, $p = 0.0290$), whereas Levene’s test confirmed unequal variances ($p = 0.0009$). Consequently, non-parametric methods were applied.

The Kruskal–Wallis test revealed statistically significant differences in quality orientation among the leadership-style groups ($H = 26.6821$, $p < 0.001$). Dunn’s post hoc test with Holm correction showed statistically significant differences only between the Market leadership group and each of the remaining groups. No significant differences were observed among the Clan, Adhocracy, and Hierarchy groups.

Spearman’s rank correlation analysis confirmed significant positive relationships between quality orientation and Clan leadership ($\rho = 0.3486$, $p < 0.001$) as well as Adhocracy leadership ($\rho = 0.2611$, $p < 0.001$). A moderate negative relationship was identified for the Market leadership style ($\rho = -0.4625$, $p < 0.001$), whereas no significant association was found for Hierarchy leadership ($\rho = -0.0175$, $p = 0.7735$).

Overall, the results support H1, H2, and H3, whereas H4 was not confirmed.

5. Discussion

The findings demonstrate that organizations characterized by Clan and Adhocracy leadership styles achieve higher levels of quality orientation than organizations dominated by the Market leadership style. These findings are consistent with previous studies emphasizing the importance of participative leadership for successful implementation of Total Quality Management (Rehan et al., 2016; Kumar & Sharma, 2017).

The positive association observed for the Clan leadership style confirms the importance of employee involvement, trust, and collaboration in developing a quality-oriented organizational culture. Similarly, the Adhocracy leadership style supports innovation and continuous improvement, both of which represent fundamental principles of Total Quality Management.

Conversely, the Market leadership style demonstrated a statistically significant negative relationship with quality orientation. Organizations strongly focused on competition and short-term performance may allocate managerial attention primarily toward achieving immediate business objectives rather than systematically improving organizational processes and developing a long-term quality culture.

Interestingly, the study found no statistically significant relationship between the Hierarchy leadership style and quality orientation. This finding suggests that formal procedures and organizational stability alone neither facilitate nor hinder the development of quality orientation. Instead, their effectiveness appears to depend on the broader organizational context and managerial practices.

Although the mining industry served only as the theoretical background of the present study, these findings appear particularly relevant for mining enterprises. Mining organizations must simultaneously maintain strict procedural compliance while encouraging continuous improvement, innovation, and employee engagement. Therefore, effective leadership in mining organizations likely requires balancing hierarchical control with participative management practices.

The study has several limitations. First, the empirical investigation was conducted exclusively among industrial enterprises operating in Poland, which may limit the generalizability of the findings. Second, the study assessed leadership style using only one dimension of the OCAI framework. Finally, the cross-sectional design does not allow the establishment of causal relationships between leadership style and quality orientation.

Conclusions

The conducted literature review indicates that quality orientation is increasingly perceived as an element of organizational culture rather than solely as a consequence of implementing formal quality management systems. Contemporary studies emphasize that leadership style influences employee engagement, continuous improvement, innovation, and the effectiveness of quality management practices.

The empirical study confirmed that quality orientation levels differ significantly across enterprises with different dominant leadership styles. The highest average quality orientation was observed in organizations with an adhocracy leadership style, followed by clan and hierarchy leadership styles, whereas enterprises dominated by the market leadership style achieved the lowest results. Statistical analysis confirmed that these differences stemmed primarily from the significantly lower quality orientation of organizations with a market leadership style.

Correlation analysis demonstrated that quality orientation was positively associated with clan and adhocracy leadership styles, while a statistically significant negative relationship was identified with the market leadership style. No significant relationship was found between quality orientation and the hierarchy leadership style. These findings suggest that organizational environments that promote cooperation, flexibility, employee involvement, and organizational learning create more favorable conditions for developing quality-oriented management than environments focused primarily on competition and short-term performance.

The absence of a significant relationship between quality orientation and the hierarchy leadership style indicates that organizational formalization alone is insufficient to achieve a high level of quality orientation.

Although procedures and standardization remain important elements of quality management systems, managerial practices that foster employee participation and continuous improvement should support them.

The obtained results contribute to a better understanding of the relationship between leadership style and quality orientation in industrial enterprises. From a managerial perspective, they suggest that organizations aiming to strengthen their quality culture should complement formal quality management systems with leadership behaviors that support collaboration, flexibility, and employee engagement. Future studies may extend the analysis by considering other dimensions of organizational culture and by examining sector-specific differences.

Summary

This study examined the relationship between organizational quality orientation and leadership style in industrial enterprises, using the mining industry as the theoretical context because of its specific managerial challenges. The empirical investigation, conducted among 274 industrial enterprises operating in Poland, combined an original questionnaire assessing quality orientation with the Organizational Culture Assessment Instrument (OCAI) to identify dominant leadership styles.

The findings demonstrated that leadership style significantly influences organizational quality orientation. Enterprises characterized by the Adhocracy leadership style achieved the highest level of quality orientation, while organizations dominated by the Market leadership style obtained significantly lower results. Correlation analysis further confirmed positive relationships between quality orientation and both Clan and Adhocracy leadership styles, whereas the Market leadership style was negatively associated with quality orientation. No statistically significant relationship was identified between the Hierarchy leadership style and quality orientation.

These findings suggest that leadership behaviors promoting employee involvement, collaboration, flexibility, and continuous improvement create more favorable conditions for developing a quality-oriented organizational culture than leadership focused primarily on competitiveness and short-term organizational performance. Although procedural discipline remains essential in many industrial sectors, including mining, it appears insufficient by itself to strengthen organizational quality orientation.

The study contributes to the literature by integrating two complementary analytical perspectives: comparisons of quality orientation among enterprises representing different dominant leadership styles and correlation analysis between leadership style intensity and quality orientation. This approach provides a broader understanding of how leadership influences the implementation of quality management principles.

The results may help managers select leadership approaches that foster sustainable quality improvement and organizational excellence. Future research should extend the analysis to specific industrial sectors, particularly mining enterprises, and investigate how leadership style interacts with organizational maturity, innovation capability, and operational performance.

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