

DRIVING KNOWLEDGE MANAGEMENT IN INDUSTRIAL FIRMS: ORGANIZATIONAL CULTURE, STRATEGIC LEADERSHIP, AND THE ALGERIAN CONTEXT CASE STUDY OF MAGHREB PIPE COMPANY FOR THE MANUFACTURE OF GIANT PIPES IN ALGERIA

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Abstract

This research aims to examine the impact of organizational culture on knowledge management processes, highlighting the mediating role of strategic leadership in supporting this relationship. The field study was conducted at Maghreb Pipe, a company in Algeria that manufactures metal and plastic pipes. To answer the research questions and test the hypotheses, a descriptive-analytical approach was employed, with a sample of 321 employees from the company. Statistical analysis was conducted using AMOS.v24. The findings revealed a significant positive direct impact of organizational culture on the activation of knowledge management processes, along with a partial mediation of strategic leadership in supporting this relationship at the company studied.

Keywords: organizational culture, strategic leadership, knowledge management.

JEL: D23, M10

1. Introduction

The contemporary industrial landscape has witnessed profound transformations driven by globalization, technological advancement, and increasingly competitive market dynamics. Within this context, industrial organizations face mounting pressure to leverage their intangible assets, particularly knowledge resources, as sources of sustainable competitive advantage (Donate and Guadamillas, 2015). Knowledge management (KM) has emerged as a critical organizational capability that enables firms to create, share, and apply knowledge systematically to enhance performance outcomes (Shujahat et al., 2019). However, the successful

implementation of KM processes does not occur in isolation; rather, it appears to be fundamentally influenced by the organizational culture that shapes employee behaviors, attitudes, and collaborative practices (Alavi et al., 2006). Organizational culture represents the shared values, beliefs, and norms that define an organization's identity and guide member behavior (Schein, 2010). Recent scholarly discourse suggests that culture serves as either an enabler or inhibitor of knowledge-related activities, depending on whether it fosters openness, trust, and collaboration or perpetuates rigidity and knowledge hoarding (Zheng et al., 2010). The relationship between organizational culture and KM has attracted considerable attention across various sectors, yet the mechanisms through which culture activates KM processes remain incompletely understood, particularly within industrial manufacturing contexts that face unique operational challenges.

Furthermore, emerging evidence indicates that leadership plays a pivotal role in bridging organizational culture and KM effectiveness. Strategic leadership, characterized by the ability to anticipate change, maintain flexibility, and empower others to create strategic transformation (Ireland and Hitt, 1999), may serve as a crucial mediating mechanism through which cultural values translate into tangible KM practices. Despite growing recognition of leadership importance, relatively few empirical studies have systematically examined the mediating function of strategic leadership in the culture-KM relationship within industrial settings (Donate and Guadamillas, 2015; Shujahat et al., 2019).

While existing scholarship has made valuable contributions to understanding organizational

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culture, strategic leadership, and KM individually, several significant gaps remain that this study aims to address. First, although researchers have documented bivariate relationships between culture and KM, and between leadership and KM, fewer studies have examined the mediating mechanisms through which culture influences knowledge processes (Shujahat et al., 2019). The specific pathways by which cultural values translate into KM effectiveness require further theoretical and empirical elaboration. Second, the preponderance of knowledge management research has focused on service industries, technology firms, and knowledge-intensive professional service organizations. Industrial manufacturing contexts, despite their economic importance and distinctive knowledge characteristics, remain relatively underexplored (Durst and Edvardsson, 2012; Kianto et al., 2017). Manufacturing organizations face unique challenges in managing both explicit technical documentation and tacit operational expertise, yet few studies have examined how culture and leadership influence KM processes in these settings. Third, geographical and cultural diversity in KM research remains limited. Most empirical studies have been conducted in Western economies, particularly the United States, Western Europe, and occasionally East Asian countries (Choi et al., 2008). North African and Middle Eastern industrial contexts have received minimal scholarly attention, despite potentially important cultural differences that may moderate relationships between organizational variables.

Fourth, methodological considerations warrant attention. Many existing studies rely on cross-sectional survey designs that document associations but cannot establish causality or temporal sequences (Donate and Guadamillas, 2015). Single-respondent designs may introduce common method bias, while aggregate quantitative approaches often lack rich contextual understanding of how culture, leadership, and KM interact in specific organizational settings (Alavi et al., 2006). Case study methodologies that combine quantitative measurement with qualitative contextual analysis remain relatively rare in this domain. Practical implications for managers in developing economy manufacturing firms

require further development. While scholars have identified culture and leadership as important KM enablers, specific guidance on how industrial organizations can cultivate appropriate cultural conditions and develop strategic leadership capabilities to enhance KM remains limited (Paoloni et al., 2020). Bridging this research-practice gap requires studies that not only test theoretical relationships but also provide actionable insights grounded in realistic organizational contexts.

Although numerous studies have examined the relationship between organizational culture and KM, they have not provided a comprehensive explanation of this relationship. Moreover, there is a dearth of previous literature addressing KM within the framework of strategic leadership as a mediating variable. Hence, the research idea materialized, focusing on the role of organizational culture in activating KM processes supported by strategic leadership. This study makes several distinctive contributions to the existing body of knowledge. First, while previous research has predominantly examined bivariate relationships between organizational culture and KM, the present investigation empirically tests a mediation model in which strategic leadership operates as a transmission mechanism linking cultural values to KM practices. Second, the study addresses a notable geographical gap in the literature by providing empirical evidence from an Algerian industrial manufacturing context, a setting that has received minimal scholarly attention despite its unique cultural and economic characteristics. Third, by employing structural equation modeling with AMOS to simultaneously test direct and indirect effects, this research offers a more rigorous and integrated analytical framework than many prior studies that relied on regression-based approaches.

To what extent does organizational culture contribute to the activation of KM processes in light of the mediating role of strategic leadership within the Maghreb Pipe Company for the manufacture of giant pipes in Algeria? The descriptive-analytical approach was adopted for both the theoretical and field aspects of the study. This involved relying on

various sources and references. The researchers also utilized the AMOS.v24 statistical package for social sciences to analyze various findings and test the study hypotheses.

Hypothesis Formulation

This section aims to formulate specific sub-hypotheses based on the proposed research, highlighting the theoretical relationship between the research concepts as explored in various previous studies. The existing literature consistently indicates that organizational culture plays a vital role in KM processes, particularly in knowledge creation, sharing, and application. Prior scholarship suggests that the success of any KM system hinges on the existence of an organizational culture that supports the efforts and activities of members in building and developing knowledge that can be used to improve work performance (Zheng et al., 2010). This necessitates that organizations cultivate and foster a culture that promotes knowledge creation and sharing among individuals. In their seminal study of over fifty American companies with KM initiatives, De Long and Fahey (2000) demonstrated a prevalent and confirmed belief that organizational culture constitutes the fundamental factor in building and investing in knowledge resources. Alavi et al. (2006) similarly confirmed that organizational culture is a critical and significant factor that positively or negatively impacts the implementation of KM programs in business organizations. Subsequent studies have affirmed that organizational culture encompasses factors that may simultaneously hinder KM within the organization while also containing key elements essential for its success (Chang and Lin, 2015).

Regarding the contribution of strategic leadership to the activation of KM processes, Ireland and Hitt (1999) posit that strategic leadership encompasses a distinctive set of practices, skills, and behaviors present in organizational managers that shape their interactions with the work team. These leadership behaviors significantly impact individual performance, serving as either obstacles or motivators, unleashing potential and talents, and encouraging knowledge sharing and organizational learning. Vera and

Crossan (2004) further argue that strategic leaders exert a decisive influence on the cultural environment that allows for the exchange of information and the sharing of knowledge necessary for organizational success. In a complementary perspective, Shujahat et al. (2019) emphasize the need for an organizational culture that fosters knowledge sharing, coupled with supportive leadership that treats knowledge and learning as integral parts of daily operations. The hypothesized relationships between the studied constructs can be visualized graphically in Figure (1).

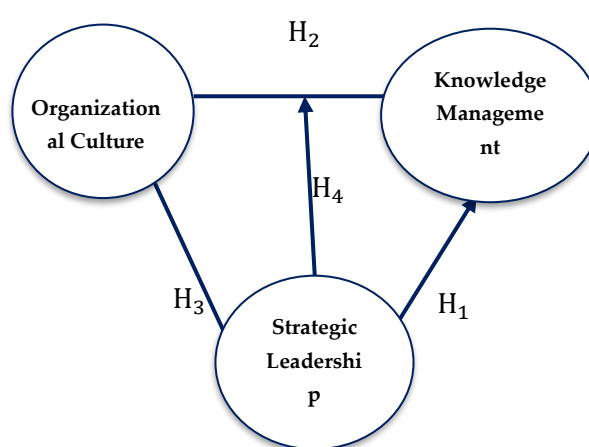


Figure 1: Theoretical Study Model
Source: Prepared by the researchers

The figure above presents the conceptual model we will empirically test in our research. This model allows us to examine four hypotheses:

- H1: The direct impact of organizational culture on strategic leadership.
- H2: The direct impact of organizational culture on KM
- H3: The direct impact of strategic leadership on KM.
- H4: The indirect impact of organizational culture on KM through strategic leadership.

2. Literature Review

2.1 Organizational Culture: Conceptualization and Dimensions

Organizational culture has been conceptualized through various theoretical lenses, yet most scholars converge on the

notion that culture comprises deeply embedded assumptions and values that influence organizational functioning (Schein, 2010). Cameron and Quinn (2011) developed the Competing Values Framework, which identifies four cultural archetypes: clan culture (emphasizing collaboration and human development), adhocracy culture (stressing innovation and flexibility), market culture (focusing on competition and achievement), and hierarchy culture (prioritizing control and efficiency). This framework has proven particularly useful in assessing cultural orientations and their organizational consequences.

Research conducted by Alavi et al. (2006) demonstrated that organizational culture significantly influences knowledge management effectiveness, with cultures emphasizing trust, collaboration, and learning orientation showing stronger KM outcomes. Similarly, Zheng et al. (2010) found that supportive organizational cultures characterized by participative decision-making and open communication facilitate knowledge sharing behaviors among employees (Choi et al. 2008) established that cultural dimensions such as collectivism and power distance moderate the effectiveness of KM initiatives, suggesting that cultural context matters considerably in determining KM success.

The literature further suggests that certain cultural characteristics appear particularly conducive to KM. Chang and Lin (2015) identified that cultures valuing innovation, risk-taking, and continuous learning create environments where employees feel psychologically safe to share knowledge and experiment with new ideas. Conversely, cultures marked by excessive hierarchy, blame-orientation, and rigid procedures tend to inhibit knowledge flows and reduce employee willingness to contribute intellectual capital (Alavi et al., 2006). These findings underscore the importance of cultivating appropriate cultural conditions as a foundation for effective KM.

More recent scholarship has further consolidated these insights while extending them into new domains. Tadesse Bogale and Debela (2024), in their comprehensive

systematic review spanning 2014–2023, identified innovation, teamwork, result orientation, and involvement as the most recurrent cultural dimensions affecting organizational outcomes, noting a sharp increase in research output on organizational culture since 2021. Lam et al. (2021) empirically demonstrated that organizational culture mediates the relationship between KM and innovation capability in Vietnamese enterprises, suggesting that cultural orientations determine how knowledge resources translate into innovative outputs. Similarly, Curado et al. (2023) found that knowledge sharing and absorptive capacity jointly mediate the culture–innovation link, reinforcing the view that culture shapes the cognitive and social processes through which knowledge is assimilated and exploited. In the digital era, Jewapatarakul and Ueasangkomsate (2024) established that digital organizational culture significantly influences knowledge acquisition processes in manufacturing SMEs undergoing Industry 4.0 transformation, a finding particularly relevant to the Algerian industrial context examined in the present study. These contemporary contributions underscore an emerging scholarly consensus that organizational culture operates not merely as a background variable but as an active mechanism shaping knowledge flows, innovation trajectories, and digital readiness across diverse institutional settings.

Taken together, the foregoing evidence suggests that organizational culture constitutes a foundational antecedent of KM effectiveness, yet the specific mechanisms through which cultural orientations translate into concrete knowledge practices remain insufficiently theorized. While the studies reviewed above establish that supportive cultures correlate with enhanced knowledge sharing, they largely treat the culture-KM link as a direct relationship without examining potential mediating pathways. This gap is particularly salient in manufacturing contexts, where the interplay between hierarchical structures and knowledge-intensive operations creates distinct dynamics that merit further empirical investigation (Al-Kurdi et al., 2020).

2.2 KM Processes in Industrial Organizations

KM encompasses systematic processes through which organizations acquire, create, share, and apply knowledge to achieve strategic objectives (Nonaka and Takeuchi, 1995). Contemporary KM frameworks typically identify several core processes: knowledge creation (generating new insights and innovations), knowledge storage (codifying and preserving organizational memory), knowledge sharing (transferring knowledge across individuals and units), and knowledge application (utilizing knowledge to solve problems and make decisions) (Alavi and Leidner, 2001).

Industrial manufacturing organizations face distinctive KM challenges compared to service or technology firms. Durst and Edvardsson (2012) observed that manufacturing enterprises must manage both explicit technical knowledge (documented procedures, specifications, and designs) and tacit experiential knowledge (craftmanship, troubleshooting skills, and operational intuition). The loss of experienced workers through retirement or turnover poses significant risks to manufacturing competitiveness, making knowledge retention particularly critical (Joe et al., 2013).

Recent research has examined factors influencing KM effectiveness in industrial contexts. Kianto et al. (2017) found that manufacturing firms with robust knowledge management practices demonstrate superior innovation performance and operational efficiency. Similarly, Donate and Guadamillas (2015) established that knowledge-oriented organizational culture positively impacts both incremental and radical innovation in manufacturing settings. These studies suggest that systematic attention to knowledge processes yields tangible competitive benefits for industrial organizations.

However, implementing KM in manufacturing environments presents notable obstacles. Employees may resist formal knowledge sharing due to concerns about job security, lack of time amid production pressures, or insufficient recognition for knowledge contributions (Paoloni et al., 2020). Moreover, geographical dispersion of manufacturing

facilities, shift work patterns, and departmental silos can fragment knowledge flows and impede organizational learning (Durst and Edvardsson, 2012). Addressing these challenges requires both structural interventions and cultural transformation.

Recent studies have increasingly recognized the transformative potential of digital technologies in overcoming traditional KM barriers in manufacturing. Idrees et al. (2023) demonstrated that KM capabilities significantly enhance organizational performance in construction firms through innovation as a mediating mechanism, suggesting parallels with other capital-intensive industrial sectors. Le (2024) found that knowledge-based human resource management practices drive innovation performance, with knowledge sharing serving as a critical transmission channel, particularly under conditions of highly competitive intensity—a finding directly relevant to Algeria's manufacturing sector as it confronts globalization pressures. Furthermore, Hamid et al. (2024) established that knowledge-oriented leadership impacts innovation performance through electronic-based KM systems in manufacturing companies, highlighting the growing convergence of leadership, KM, and digital infrastructure as interrelated organizational capabilities. These contemporary contributions extend the KM discourse beyond traditional process-centric models toward a more integrated understanding of how leadership, culture, and technological infrastructure interact to determine KM effectiveness in industrial settings.

The preceding discussion reveals that while KM processes in industrial organizations have received growing scholarly attention, most empirical work has focused on Western manufacturing contexts. The challenges of managing both tacit and explicit knowledge in developing economy manufacturing firms, such as those in North Africa, remain largely unexplored. Moreover, the role of organizational antecedents, particularly organizational culture and leadership, in facilitating knowledge processes within these specific industrial settings warrants dedicated empirical examination (Abubakar et al., 2019).

2.3 Strategic Leadership as an Organizational Capability

Strategic leadership refers to the capacity to anticipate environmental changes, maintain strategic flexibility, empower human capital, and manage organizational resources to achieve long-term objectives (Ireland and Hitt, 1999). Unlike operational leadership focused on daily execution, strategic leadership emphasizes vision creation, strategic thinking, and systemic organizational transformation (Hitt et al., 2016). This leadership approach has gained prominence as organizations navigate increasingly volatile and complex business environments.

Several theoretical frameworks illuminate strategic leadership's contributions to organizational effectiveness. The Upper Echelons Theory posits that organizational outcomes reflect top management's cognitive orientations and values (Hambrick and Mason, 1984), suggesting that strategic leaders shape organizational direction through their perceptions and choices. The Resource-Based View perspectives highlight strategic leadership's role in developing and leveraging organizational capabilities, including knowledge resources, as sources of competitive advantage (Hitt et al., 2016).

Empirical research has documented strategic leadership's impact across various organizational domains. Ling et al. (2008) demonstrated that CEO strategic leadership behaviors influence firm performance through their effects on organizational ambidexterity, the capacity to simultaneously pursue exploitation and exploration. More recently, Shujahat et al. (2019) found that strategic leadership directly enhances KM processes by establishing clear knowledge visions, allocating resources to KM initiatives, and modeling knowledge-sharing behaviors. These findings suggest that strategic leadership serves as a critical enabler of knowledge-oriented organizational capabilities.

The relationship between strategic leadership and organizational culture merits particular attention. Leaders shape culture through their actions, priorities, and symbolic behaviors, gradually influencing shared values and norms

(Schein, 2010). Conversely, existing cultural patterns constrain leadership effectiveness, as leaders must work within cultural parameters to achieve acceptance for strategic initiatives (Schneider et al., 2013). This reciprocal relationship implies that strategic leadership may function as a mechanism through which cultural values translate into concrete organizational practices, including KM activities.

The theoretical rationale for positioning strategic leadership as a mediator, rather than a moderator or independent predictor, rests on three interconnected arguments. First, drawing upon the Upper Echelons Theory (Hambrick & Mason, 1984), organizational culture shapes the cognitive frames and values of top management, who in turn translate these orientations into strategic decisions and practices that affect KM outcomes. Second, from a Resource-Based View perspective (Hitt et al., 2016), strategic leaders serve as the agents through whom cultural resources are mobilized and deployed toward knowledge-intensive activities; without active leadership engagement, cultural values remain latent rather than operationalized. Third, strategic leaders function as behavioral role models whose visible commitment to knowledge sharing signals organizational priorities and legitimizes employee participation in KM initiatives (Nguyen & Malik, 2022). These three pathways collectively suggest that strategic leadership constitutes a necessary intermediary mechanism through which organizational culture exerts its influence on KM processes.

Recent empirical work provides further support for these theoretical arguments. Tesema et al. (2024), in a study of public organizations in Ethiopia, established that KM partially mediates the relationship between strategic leadership and change management, reinforcing the proposition that leadership and KM are dynamically interlinked rather than independently operating constructs. Gürlek and Çemberci (2020) demonstrated through serial mediation analysis that knowledge-oriented leadership enhances organizational performance by sequentially improving KM capacity and innovation performance, suggesting that leadership effects cascade

through knowledge-related mechanisms. In the manufacturing domain specifically, Hamid et al. (2024) found that knowledge-oriented leadership significantly influences innovation outcomes through electronic-based KM systems, highlighting the critical interface between leadership vision and technological KM infrastructure. These contemporary findings reinforce the theoretical positioning of strategic leadership as a mediating mechanism while extending the evidence base beyond Western samples to include developing economy and manufacturing contexts closely aligned with the present study.

2.4 Theoretical Integration: Culture, Leadership, and KM

Recent scholarship has increasingly recognized the interconnectedness of organizational culture, leadership, and KM, moving beyond examinations of isolated bivariate relationships toward more integrative models. Donate and Guadamillas (2015) proposed that organizational culture influences innovation performance through its effects on KM practices, suggesting that culture creates conditions enabling or constraining knowledge processes. Similarly, Shujahat et al. (2019) demonstrated that strategic leadership mediates the relationship between organizational culture and KM process capability, indicating that leadership serves as a transmission mechanism for cultural influences.

The mediating role of strategic leadership in the culture-KM relationship appears theoretically grounded in several considerations. First, while culture establishes broad values and norms regarding knowledge and collaboration, leadership translates these abstract orientations into specific structures, incentives, and practices that operationalize KM (Vera and Crossan, 2004). Second, strategic leaders possess formal authority and resource control enabling them to institutionalize knowledge-friendly practices aligned with cultural values (Ireland and Hitt, 1999). Third, leaders serve as role models whose knowledge behaviors signal organizational priorities and legitimize employee knowledge-sharing activities (Shujahat et al., 2019).

Despite these theoretical insights, several gaps remain in current understanding. Much of the existing research has been conducted in Western organizational contexts, particularly North America and Europe, raising questions about generalizability to other cultural environments (Choi et al., 2008). Manufacturing industries remain underrepresented in KM research compared to technology and service sectors, despite their economic significance and distinctive knowledge challenges (Durst and Edvardsson, 2012). Moreover, few studies have empirically tested mediation models using rigorous methodologies that establish causal pathways rather than merely documenting associations

3. Framework of the Study

3.1 Field Study Procedures

3.1.1 Study Population and Sample

The study was conducted within the industrial sector in Algeria, specifically at Maghreb Pipe, a manufacturing company specializing in metal and plastic pipes. The study population comprised all 428 employees of the organization. A simple random sample of 350 individuals was selected and surveyed. After data cleaning, 321 questionnaires remained, forming the final study sample. The demographic profile of the final sample ($n = 321$) was as follows. Regarding the hierarchical position, the sample comprised 38 senior managers (11.8%), 67 middle managers (20.9%), 84 supervisors and team leaders (26.2%), and 132 non-managerial employees (41.1%), thus capturing perspectives from all organizational levels. In terms of gender distribution, 247 respondents (76.9%) were male and 74 (23.1%) were female, reflecting the gender composition typical of Algerian heavy manufacturing industries. With respect to educational attainment, 42 respondents (13.1%) held postgraduate degrees, 156 (48.6%) held university bachelor's degrees, 89 (27.7%) held technical diplomas, and 34 (10.6%) had completed secondary education. Concerning organizational tenure, 58 respondents (18.1%) had worked at Maghreb Pipe for fewer than 5 years, 112 (34.9%) for 5–10 years, 97 (30.2%) for 11–20 years, and 54 (16.8%) for more than 20 years. The inclusion

of the respondents across all hierarchical levels and tenure ranges strengthened the ecological validity of the findings, as perceptions of organizational culture, leadership, and KM practices were captured from diverse organizational vantage points rather than solely from managerial perspectives.

The research adopted a cross-sectional quantitative survey design within a single-case study framework. This design was deemed appropriate given the exploratory nature of the investigation, which represents one of the first empirical tests of the OC-SL-KM mediation model in the Algerian industrial manufacturing context. The measurement instrument employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

3.1.2 Study Instruments:

A questionnaire was designed based on the details presented in the Table 1 Organizational culture was operationalized through five dimensions adapted from Cameron and Quinn (2011): independence, creativity, efficiency and effectiveness, competitiveness, and risk-taking.

Strategic leadership was measured using a unidimensional scale of 10 items derived from Ireland and Hitt (1999). KM was assessed through three sub-dimensions: knowledge acquisition, knowledge distribution, and knowledge application, adapted from Alavi and Leidner (2001). To mitigate common method bias, (Hamid& Mardiana,2024) single-factor test was conducted; the results indicated that no single factor accounted for more than 35% of the total variance, suggesting that common method bias does not pose a significant threat to the validity of the findings. The operationalization of organizational culture variables merits further elaboration given their relevance to the Algerian industrial context. The independence dimension captures the degree to which employees perceive autonomy in decision-making and task execution, a variable of particular significance in Algerian manufacturing firms where state-enterprise governance traditions have historically concentrated authority at senior management levels. The creativity dimension assesses the organizational climate for innovation and experimentation, which is critical in pipe manufacturing where product diversification and process optimization require continuous technical problem-solving.

Table 1. Design of the Study Instrument and Coding of Variables

Latent variables		Coding	Observed variables	number
Organizational culture (ORC)	Independence	IN	IN 1 – IN 4	4
	Ability to be Creative	OC	OC 1 – OC 5	4
	Efficiency and Effectiveness	EE	EE 1 – EE 5	4
	Competitiveness	CO	CO 1 – CO 5	4
	Risks	RI	RI 1 – RI 5	4
Strategic leadership (SL)			SL 1 – SL 10	7
Knowledge management (KM)	Acquisition of knowledge	AK	AK 1 – AK 5	4
	Distribution of knowledge	DK	DK 1 – DK 5	4
	Use of knowledge	UK	UK 1 – UK 5	4

Source: Prepared by the researchers

Efficiency and effectiveness reflect the cultural emphasis on output quality and resource optimization, directly relevant to a manufacturing environment subject to international quality certification standards (ISO 9001) that Maghreb Pipe maintains. Competitiveness captures the extent to which the organizational culture promotes market-oriented thinking and benchmarking against industry standards, a dimension that has gained salience as Algeria's manufacturing sector increasingly faces competition from imported products. Finally, risk-taking assesses the cultural tolerance for uncertainty and experimentation, a construct particularly pertinent in transitional economies where regulatory frameworks and market conditions remain volatile. Collectively, these five dimensions provide a culturally sensitive measurement of organizational culture that extends beyond generic Western frameworks by capturing orientations relevant to the specific governance structures, competitive dynamics, and institutional legacies of Algerian industrial organizations (Tadesse Bogale and Debela, 2024).

3.2 Assumptions of Confirmatory Factor Analysis (CFA)

3.2.1 Face Validity of the Study Instrument

The research instrument was reviewed and revised by experienced professors and reviewers in research methodology, strategic management, and leadership. Their feedback and suggestions were incorporated into the necessary revisions.

3.2.2 The Multivariate Normal Distribution for Data

Table 2 displays the critical values for Mardia's coefficient. We observe that all critical ratios (c.r) were less than the assumed value of ± 1.96 . Consequently, we accept the null hypothesis (H_0) that the data is normally distributed.

Table 2: Results of Mardia's Coefficient

	N° of variables	Multivariate	c.r
ORC	5	-1.345	-0.312
SL	1	5.111	0.403
KM	3	2.521	0.223

Source: Prepared by the researchers based on AMOS.V24 output

4.2.3 Reliability of the Study Instrument

McDonald's Omega coefficient was used to assess reliability, utilizing the AMOS v24 software. The results are presented in Table 3. Table 3 shows that the reliability coefficient (ω) for all study variables ranged from 71.5 to 84.6. These values are statistically acceptable and considered high, exceeding the standard threshold of 70%. This indicates that the instrument is reliable and can be confidently used for the field study.

3.3 Confirmatory Factor Analysis of the study model (CFA)

Confirmatory Factor Analysis (CFA) is considered an advanced statistical method

Table 3. Results of the "McDonald's Omega" factor for the study tool

Variable	Dimension	Ferries	ω	Variable	Dimension	Ferries	ω
Organizational culture (ORC)	IN	4	77.3	Knowledge management (KM)	AK	4	79.1
	OC	4	78.5		DK	4	81.2
	EE	4	82.3		UK	4	84.6
	CO	4	72.1				
	RI	4	81.6				
Strategic leadership (SL)					SL	7	77.1

Source: Prepared by the researchers based on the findings from the MACRO-OMEGA outputs.

used to test the extent to which field data fit the proposed theoretical model of the study. This analysis aims to verify that the questionnaire items accurately measure the dimensions or variables they are intended to assess. It also contributes to evaluating the validity and reliability of the model through examining factor loadings and model fit indices. Accordingly, CFA provides scientific evidence on the adequacy of the adopted model and the reliability of its results in interpreting the studied phenomenon

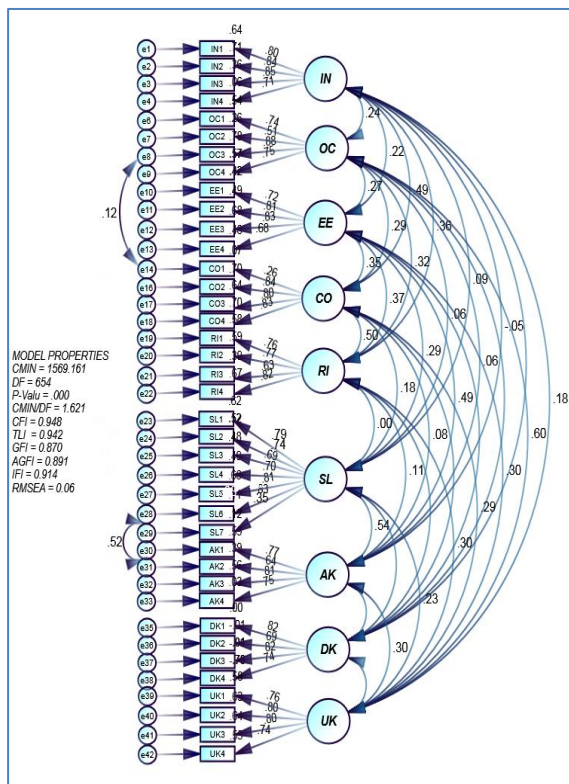


Figure 2. Design of the standard model for the study using CFA

Source: Prepared by the researchers based on AMOS.V24 output

Figure 2 represents the confirmatory factor analysis of all dimensions of the study's theoretical model, as evident in the model generated using AMOS v24. The figure demonstrates that the items or variables (observed variables) are related to the latent variables (dimensions), with loadings ranging between [0.88; 0.64], which are considered good values within their acceptable ranges. This indicates that all items effectively explain the dimensions they load on. Consequently, construct validity is established.

To assess the model's fit with the data, we rely on the values of the fit indices presented in the same figure. The value of the standardized chi-square ($1 < \text{cmin/df} = 1.621 < 2$) falls within its statistically acceptable range. Additionally, we observe that the other indices perform well (CFI = 0.948, IFI = 0.914, TLI = 0.942), except for the goodness-of-fit indices (GFI = 0.870, AGFI = 0.891), which remain below the desired level for good fit. This might be attributed to the number of parameters that need to be estimated in the model or to the sample size. However, these indices achieve a moderately acceptable level of fit. Overall, the measurement model exhibits a good fit with the data, confirming construct validity and enabling the transition to the structural model of the study.

4. Discussion

The findings of this study provide empirical support for the hypothesized relationships between organizational culture, strategic leadership, and KM processes within the context of an Algerian industrial manufacturing organization. The results warrant careful theoretical interpretation in light of existing scholarship and the distinctive characteristics of the study context.

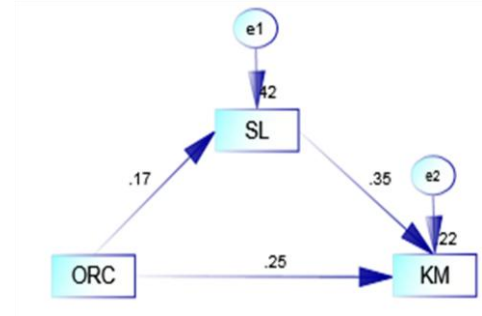
The significant direct positive effect of organizational culture on KM (H2) aligns with the theoretical propositions of Zheng et al. (2010) and the empirical findings of Chang and Lin (2015), who demonstrated that cultures emphasizing collaboration, innovation, and trust create environments conducive to knowledge-related activities. In the specific context of Maghreb Pipe, the manufacturing culture appears to encompass sufficient openness and collaborative orientation to support knowledge creation, sharing, and application. This finding extends the generalizability of culture-KM relationships beyond Western contexts to North African industrial settings, addressing the geographical gap identified by Choi et al. (2008).

The observation of partial rather than full mediation by strategic leadership (H4) is theoretically significant. This result suggests that while a substantial portion of organizational influence on KM is channeled

through strategic leadership actions, culture also exerts a direct effect on knowledge processes that operates independently of formal leadership mechanisms. This interpretation is consistent with the view that deeply embedded cultural values can influence employee knowledge behaviors through internalized norms and peer expectations, even without direct leadership intervention (Alavi et al., 2006). The coexistence of direct and indirect pathways underscores the multifaceted nature of the culture-KM relationship and supports the theoretical proposition that strategic leadership represents one of several mechanisms through which culture shapes knowledge outcomes. The finding that strategic leadership only partially mediates the organizational culture-KM relationship carries important practical implications and invites consideration of additional explanatory factors. The residual direct effect of culture on KM ($\beta = 0.526$ vs. indirect effect of 0.158) suggests that other organizational mechanisms transmit cultural influence beyond the leadership channel. These may include: (a) peer-to-peer knowledge exchange norms embedded in team-level micro-cultures, which operate independently of formal managerial directives (Radaelli et al., 2024); (b) information technology infrastructure and digital knowledge platforms that institutionalize knowledge flows without requiring direct leadership intervention (Jewapatarakul and Ueasangkomsate, 2024); (c) formalized standard operating procedures and quality management systems that codify tacit knowledge into organizational routines (Lam et al., 2021); and (d) communities of practice and informal professional networks within the manufacturing setting that facilitate lateral knowledge transfer across functional boundaries. These complementary pathways suggest that Maghreb Pipe's organizational culture has permeated multiple structural and social layers of the organization, creating redundant channels for knowledge activation that do not depend exclusively on top-management agency. Future research should decompose these additional mediating mechanisms to establish their relative contributions.

It is important to contextualize these findings within the Algerian industrial landscape. Algeria's manufacturing sector operates within a transitional economy characterized by state-owned enterprise legacies, evolving management practices, and increasing competitive pressures from globalization (Djefflat, 2017). The significant role of organizational culture observed in this study

Figure 3: Path Analysis Model of Study Variables



Source: Prepared by the researchers based on AMOS.V24

may reflect the particular importance of informal norms and shared values in organizational contexts where formal KM systems and infrastructure remain relatively underdeveloped compared to advanced economies. Similarly, the mediating function of strategic leadership may be particularly salient in settings where hierarchical organizational structures position senior management as critical gatekeepers of knowledge-related initiatives.

More specifically, the pipe manufacturing industry in Algeria occupies a strategic position within the national industrialization agenda, as it supplies critical infrastructure for the hydrocarbon, water distribution, and construction sectors. Within this industrial activity, knowledge utilization emerges as a particularly high-loading factor in the structural model, which may be attributed to the technical complexity of pipe manufacturing processes that demand continuous application of metallurgical, quality control, and safety knowledge in real-time production environments. Algeria's ongoing transition under the "Digital Algeria 2030" strategy has begun to introduce digital knowledge platforms and Industry 4.0 technologies into manufacturing settings, yet the adoption of such tools in state-influenced industrial

enterprises remains uneven and heavily dependent on organizational culture and leadership commitment (Tadesse Bogale and Debela, 2024). Consequently, the findings of this study should be interpreted against the backdrop of a manufacturing context where traditional knowledge-sharing mechanisms—mentoring, on-the-job training, and informal communities of practice—coexist with nascent digital systems, and where the strategic orientation of senior leadership determines the pace and scope of KM institutionalization.

Path analysis and the Baron & Kenny approach to structural equation modeling (SEM) were employed using AMOS v24 to simultaneously examine the direct and indirect effects between study variables.

The regression coefficients presented in Figure 03 for the three paths indicate a positive direct effect between the independent variable (ORC) and both the dependent variable (KM) and the mediator (SL). Additionally, there is a positive direct effect of the mediator (SL) on KM. This is supported by the positive values of the coefficients (0.17, 0.35, 0.27). The values above the dependent and mediator variables (0.22, 0.42) represent the squared correlations (coefficient of determination), which are considered good as they fall within the range of 0.20 to 0.70. To assess the statistical significance and explanatory power of this effect, Tables 4 and 5 are consulted.

(β), standard error (E.S.), and critical t-statistic (C.R.). These values can be compared to the standard value of 1.964 or the P-Value (0.05) to interpret the relationship between the variables. The interpretation of the results in Table 04 and the testing of the study hypotheses can be detailed as follows.

Hypothesis 01: We observe that the regression coefficient value for the first path, which was 0.302, is statistically significant ($P = 0.000 < 5\%$). Additionally, the critical t-statistic value of 6.845 is statistically significant because it is greater than the minimum value of 1.964. This signifies the rejection of the null hypothesis (H_0) and the acceptance of the alternative hypothesis (H_1), which proposes a significant direct effect between organizational culture and strategic leadership in the Maghreb Pipe company, a manufacturer of metal and plastic pipes in Algeria. This can be attributed to the company's strong emphasis on internal values, systems, and instructions, as well as its commitment to maintaining employee health and safety and upholding ethical standards. During field visits, the researchers observed that the studied organization possesses an organizational culture that provides leaders with support and facilitates their work, while simultaneously motivating them to take responsibility and safeguard the organization's resources and operations.

Hypothesis 02: The regression coefficient value for the second path, 0.526, is considered good and statistically significant because ($P < 1\%$).

Table 4: Direct Effect Estimates between Study Variables

Variable	Estimate	S.E.	C.R.	P
sl <--- OrC	.302	.055	6.845	***
Km <--- OrC	.526	.046	12.142	***
km <--- sl	.211	.032	5.522	***
0.05>0.01 , * $P > 0.001$, ** $P > 0.01$, *** $P > 0.001$				

Source: Prepared by the researchers based on AMOS.V24 output

The results presented in Table 4 above provide a summary of the regression coefficient values

This indicates the presence of a significant direct effect between organizational culture

and KM within the researched organization. The critical t-statistic value reached 12.142, exceeding its minimum value of 1.964, thus validating the second hypothesis of the study. The organizational culture of the studied organization contributes to streamlining operations, coordinating efforts between units and departments, and fostering communication between leaders and individuals to minimize the time and effort required to acquire, manage, and exchange knowledge in a timely manner, whether at the individual, group, or organizational level. These practices are an integral part of the company's culture and principles, which all members are required to adhere to.

Hypothesis 03: The regression coefficient value for the third path was 0.211, statistically significant because ($P < 5\%$). The critical t-statistic (C.R.) is also greater than 1.964, confirming the third hypothesis of the study, which posits a significant direct effect between strategic leadership and KM within the studied organization. This can be attributed to the existence of practical strategic leadership practices within the organization and the awareness among most leaders regarding the necessity of constructing a comprehensive vision that defines the organization's goals and direction. Furthermore, the organization recognizes the challenges of operating in a dynamic and rapidly evolving environment, leading to a heightened focus on gathering clear insights into the transformations occurring within its environment. This necessitates the establishment of a supportive organizational culture that empowers employees to take action and make decisions related to their work, and encourages them to learn, share knowledge, and develop their skills.

Hypothesis 04: To test the ability of strategic leadership to mediate the relationship between organizational culture and KM within the organization, the following table can be utilized:

Table 5: The Direct, Indirect Impact and Overall Effect of Study Variables

Path	Direct Effects	Indirect Effects	Total Effects	Conclusion
KM <--- SL <--- -- ORC	.526**	.158**	0.684**	Partial Mediation
P-Value	0.002	0.003	0.005	

*** $P < 0.001$, ** $P < 0.01$, * $P < 0.05$; Indirect Effects = $0.302 * 0.526$; Total Effects = Direct + Indirect = $0.526 + 0.158$

Source: Prepared by the researchers based on AMOS.V24 output

The results presented in Table 5 demonstrate a significant total effect between organizational culture (ORC) and comprehensive KM (KM), even without the mediating variable of strategic leadership (SL), with a p-value of 0.005. Furthermore, both the direct effect of the independent variable (ORC) on the dependent variable (KM) ($p = 0.002$) and the indirect effect mediated by the mediating variable (SL) ($p = 0.003$) were statistically significant. However, the direct effect was larger than the indirect effect ($0.526 > 0.158$), indicating that strategic leadership partially mediates the relationship between organizational culture and KM.

The findings indicate a complete confirmation of the study's general hypothesis: namely, that organizational culture has a statistically significant impact on activating KM processes, mediated by the role of strategic leadership within the investigated organization:

- There is a statistically significant direct positive effect between organizational culture and strategic leadership.
- There is a statistically significant direct positive effect between organizational culture and KM.
- There is a statistically significant direct positive effect between strategic leadership and KM.
- Strategic leadership partially mediates the relationship between organizational culture and KM.

Limitations and Future Research Directions

While this study offers meaningful theoretical and practical contributions, several limitations should be acknowledged. First, the data were collected from a single manufacturing organization (Maghreb Pipe) in Algeria, which inherently limits the generalizability of findings to other industrial organizations, sectors, or national contexts.

Second, the cross-sectional survey design precludes causal inference regarding the relationships between organizational culture, strategic leadership, and KM. Although structural equation modeling was employed to test directional hypotheses, the temporal ordering of variables cannot be established without longitudinal data.

Third, reliance on self-reported survey data from a single respondent source introduces potential common method bias, although (Hamid& Mardiana,2024). single-factor test suggested this was not a dominant concern. Future studies would benefit from multi-source data collection approaches.

Fourth, the measurement of strategic leadership as a unidimensional construct may not fully capture the multifaceted nature of leadership practices. Future research could disaggregate strategic leadership into specific dimensions to examine which components most strongly mediate the culture-KM relationship.

Building on these limitations, several directions for future research are recommended: longitudinal studies tracking changes over time, multi-organization studies across different sectors and regions, qualitative or mixed-methods approaches for richer contextual understanding, and comparative cross-cultural studies to identify universal versus culturally contingent aspects of these organizational dynamics.

5. Conclusion

Given the rapid changes in the external environment of industrial organizations and the increasing intensity of competition in the

context of globalization and the knowledge economy, decision-makers in the industrial sector in Algeria and elsewhere must consider adopting approaches based on qualified resources through continuous training, knowledge and experience sharing, and maximizing their intellectual assets. Therefore, the KM approach will be a solution to many of the problems that hinder the development of many institutions. However, this will remain ineffective unless it is accompanied by organizational culture, the promotion of values related to building trust between senior management and other administrative levels, and the activation of the values of cooperation, teamwork, and the encouragement of knowledge sharing among all its members.

Based on the applied study and statistical analysis of the data, a number of findings were obtained, which can be summarized as follows:

- Complete confirmation of the general hypothesis of the study, with all sub-hypotheses confirmed. Therefore, the Maghreb Pipe institution has an organizational culture that enables it to successfully generate, share, and apply knowledge, supported by strategic leadership represented by senior management.
- A significant effect of organizational culture on strategic leadership practices, with a moderate impact level and statistical significance at the 0.05 level in the studied sample.
- A significant effect of organizational culture on KM, at a moderate level, at the 0.05 level.
- A significant effect of strategic leadership, at a moderate level, in activating KM processes at the 0.05 level.
- Partial mediation of strategic leadership in supporting the relationship between organizational culture and KM within the studied institution.

Among the suggestions we offer in this study are the following:

- It is clear that the success of KM in industrial sector institutions relies primarily on adopting a supportive organizational culture that aligns with the KM environment, moving from traditional management, with its bureaucratic and

outdated concepts, to management with new values and work concepts.

- Working to establish a clearly defined organizational culture among all members of the institution by involving all stakeholders, developing an organizational guide containing its motto and culture, specifying the description of each job within the organization, including its objectives, powers, responsibilities, and skills necessary to perform the job, and utilizing available and adopted methods and tools to support knowledge sharing among individuals and develop the organization's creative and competitive capabilities.
- The need to create a suitable organizational climate for building a knowledge culture and promoting awareness of the importance of knowledge as a resource for wealth.
- Emphasizing the importance of increasing the awareness of institutional leaders of the effective role that the prevalent organizational culture plays among its members in the success and strengthening of KM processes in a way that achieves excellence, growth, and development.
- Benefiting from the experiences of institutions and countries in KM and organizational culture.
- The results demonstrate that strategic leadership practices have a positive impact on KM, emphasizing the need for senior management to be more deeply involved in knowledge generation, sharing, and application programs, and to understand their content.

Given the case-study nature of this research, these recommendations can be concretized as actionable interventions for Maghreb Pipe and comparable Algerian industrial firms. First, the high factor loading of knowledge utilization in the structural model suggests that the organization's primary challenge lies not in knowledge acquisition but in its systematic application to operational decision-making. To address this, we recommend the implementation of a digital knowledge repository system—such as enterprise wiki platforms or SharePoint-based solutions—that

codifies tacit manufacturing expertise (troubleshooting protocols, quality control heuristics, and equipment maintenance routines) into accessible, searchable digital assets (Jewapatarakul and Ueasangkomsate, 2024). Second, strategic leaders at Maghreb Pipe should institutionalize structured knowledge-sharing sessions—such as weekly cross-functional debriefing meetings and monthly “lessons learned” workshops—that formalize the currently informal communities of practice identified in this study. Third, given the observed partial mediation, the organization should invest in both top-down leadership-driven KM initiatives and bottom-up peer-to-peer knowledge networks; concrete mechanisms include mentorship programs pairing experienced operators with newer employees, gamified knowledge contribution platforms, and performance evaluation criteria that explicitly reward knowledge-sharing behaviors (Gürlek and Çemberci, 2020). Fourth, in alignment with Algeria's Digital Algeria 2030 strategy, Maghreb Pipe should explore Industry 4.0 knowledge tools—including IoT-enabled predictive maintenance systems that generate real-time operational knowledge and AI-assisted quality monitoring dashboards—as technological enablers of the KM processes identified in this study. These specific recommendations transform the general findings into implementable managerial strategies grounded in the empirical realities of Algerian pipe manufacturing.

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