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Editorial Office: Rzeszów University of Technology, The Faculty of Management,
10 Powstańców Warszawy Ave., 35-029 Rzeszów, phone: +48 17 8651383, e-mail: mmr1@prz.edu.pl
<https://mmr.prz.edu.pl>

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From the Editorial Committee

We are giving you the next Vol. 31, No. 2(2026) issue of the scientific journal of the Faculty of Management of the Rzeszów University of Technology entitled “Modern Management Review”.

The primary objective of the journal is to promote publishing of the results of scientific research within economic and social issues in economics, law, finance, management, marketing, logistics, as well as politics, corporate history and social sciences.

Our aim is also to raise the merits and the international position of the journal published by our Faculty. That is why we provided foreign Advisory Board, as well as an international team of Reviewers to increase the value of the scientific publications.

The works placed in this issue include many assumptions and decisions, theoretical solutions as well as research results, analyses, comparisons and reflections of the Authors.

We would like to thank all those who contributed to the issue of the journal and we hope that published articles will meet your kind interest and will be an inspiration for further research and discussions.

With compliments
Editorial Committee

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Yahia BOUKERCH¹
Kamilia CHERNANE²
Nesrine FETTIH³

IMPROVING CUSTOMER EXPERIENCE WITH PHONE CARRIERS THROUGH AI-DRIVEN AUTOMATION AND PREDICTIVE ANALYTICS

This article examines how artificial intelligence (AI) improves customer experience in the telecommunications sector, focusing on predictive analytics and AI-driven automation. While prior research has examined these AI-enabled capabilities separately, limited empirical evidence exists regarding their integrated influence on customer engagement and customer experience. A quantitative approach was used, and data were collected through a structured survey of mobile service customers. Three hypotheses were tested to analyze the relationships between predictive analytics, automation, customer engagement, and customer experience. The findings show that predictive analytics supports automation by improving the use of customer data, while automation has a stronger effect on customer engagement. Customer engagement emerged as the strongest contributor to customer experience. The study contributes to the literature by providing empirical evidence of the interconnected role of these AI-driven capabilities within a unified framework. Practically, the results suggest that phone carriers should integrate data analysis, automation, and engagement tools to deliver more responsive and personalized customer interactions.

Keywords: artificial intelligence, predictive analytics, automation, customer engagement, customer experience.

1. INTRODUCTION

Artificial intelligence (AI) has become a foundational element of contemporary marketing strategy, fundamentally reshaping how firms generate value and sustain competitive advantage. Recent industry evidence underscores the scale and speed of this

¹ Yahia Boukerch, Ecole Supérieure de Commerce (ESC), Algeria; e-mail: y_boukerch@esc-alger.dz. (corresponding author). ORCID: 0009-0007-5850-9984.

² Kamilia Chernane, Ecole Supérieure de Commerce (ESC), Algeria; e-mail: etd_kchernane@esc-alger.dz. ORCID: 0009-0007-5518-0917.

³ Nesrine Fettihi, Ecole Supérieure de Commerce (ESC), Algeria; e-mail: etd_nfettihi@esc-alger.dz. ORCID: 0009-0001-9764-5475.

transformation. Edward Tian's AI Marketing Benchmark Report (2025) indicates that 69.1% of marketers have already integrated AI into their core marketing activities, while CoSchedule's State of AI in Marketing Report (CoSchedule, 2025) reports that 75% of marketers perceive AI as a source of competitive advantage, with 28.24% observing a substantial improvement in their market position. These trends signal a structural shift in marketing practice from intuition-driven decision-making toward AI-enabled, data-centric approaches.

Central to this shift are predictive analytics and AI-driven automation, which increasingly underpin firms' ability to deliver personalized and scalable customer experiences. Predictive analytics enables marketers to anticipate customer needs and behaviors by leveraging historical data, usage patterns, and individual preferences, thereby supporting proactive and informed decision-making. Concurrently, AI-driven automation enhances both efficiency and consistency in customer-facing processes, including personalized recommendations, targeted offers, and real-time customer support. Together, these technologies redefine customer engagement by enabling more relevant, timely, and context-aware interactions across touchpoints, ultimately shaping customers' experiential evaluations.

Despite the expanding body of literature on AI in marketing, empirical research remains fragmented, with limited integration of predictive analytics, AI-driven automation, and customer engagement within a unified framework. Moreover, evidence from emerging markets and service-intensive industries – such as telecommunications, where customer interactions are frequent, data-rich, and technologically mediated – remains scarce. To address these gaps, the present study investigates how predictive analytics and AI-driven automation jointly influence customer engagement and, in turn, customer experience. By doing so, this research contributes to the marketing literature by offering a more nuanced understanding of AI-enabled value creation in contemporary service contexts.

2. LITERATURE REVIEW

Artificial intelligence (AI) is increasingly being adopted across industries as a core driver of digital transformation. According to the State of AI in Marketing Report (2025), approximately 70% of organizations express openness toward the adoption of AI tools, indicating a growing level of organizational readiness. Across sectors such as finance, healthcare, retail, and manufacturing, AI is already generating substantial value, primarily through its capacity to process large volumes of data, identify complex patterns, and automate routine and analytical tasks (Gurjar et al., 2024; Mahabub et al., 2025).

From a managerial perspective, AI offers a significant strategic advantage by automating repetitive processes, reducing operational costs, and enabling faster, data-informed decision-making. In addition, AI contributes to closing skill gaps, enhancing customer satisfaction, and strengthening customer engagement through more personalized and efficient interactions (Akerkar, 2019). Sector-specific applications further illustrate its impact: in finance, AI improves fraud detection and risk assessment capabilities (Wang et al., 2024; Njeru, 2023), while in human resource management it supports predictive analytics and streamlines administrative functions (Gurjar et al., 2024).

Beyond its operational utility, AI is increasingly recognized as a strategic leadership enabler. It facilitates real-time decision-making, scenario analysis, and long-term strategic planning, thereby giving rise to hybrid leadership models in which AI augments, rather than replaces, human judgment (Mahabub et al., 2025). Moreover, organizations

increasingly deploy AI for competitive intelligence, market surveillance, and strategic foresight, enabling rapid adaptation to environmental changes and the sustained development of competitive advantage (Rane et al., 2024).

The expanding role of AI in business is closely intertwined with the evolution of marketing practices. Marketing has progressively shifted from traditional mass communication channels – such as television, radio, and print media – toward digital and data-driven approaches that support targeted, interactive, and measurable communication (Bist et al., 2022; Durmaz, Efendioglu, 2016). While traditional marketing remains relevant for building brand awareness, digital tools have enhanced firms' ability to drive engagement and customer action through data-based insights (Chaffey, Ellis-Chadwick, 2016; Kotler et al., 2017). This evolution has culminated in the emergence of Marketing 5.0, characterized by the integration of artificial intelligence, automation, and advanced analytics to deliver highly personalized yet human-centered customer experiences (Kotler et al., 2021). Consequently, marketing has emerged as one of the business functions most profoundly affected by AI adoption, providing a compelling context for examining the role of AI-driven automation and predictive analytics in shaping customer experience.

2.1. Predictive Analytics

Predictive analytics represents one of the most influential applications of artificial intelligence (AI) in contemporary marketing (Noil, 2024). By leveraging historical data, machine learning techniques, and AI algorithms, predictive analytics enables firms to forecast customer behavior and purchasing patterns, thereby improving marketing strategy optimization. AI-powered analytics tools further enhance decision quality by providing timely, accurate, and actionable insights, allowing organizations to identify high-potential leads and allocate resources more effectively (Noil, 2024).

In both business-to-consumer (B2C) and business-to-business (B2B) contexts, predictive analytics supports customer lifetime value estimation, targeted retention initiatives, and personalized customer relationship management (CRM) interventions. These applications enhance customer experience, satisfaction, loyalty, and long-term value creation (Noil, 2024; Potla, Pottla, 2024). In service industries such as telecommunications, predictive analytics enables firms to identify customers at risk of churn by analyzing service usage patterns and billing histories, facilitating targeted retention offers aimed at reducing customer attrition (Noil, 2024).

Beyond strategic applications, predictive analytics improves operational efficiency by streamlining marketing processes and enabling real-time, responsive customer interactions (Egorenkov, 2022; Gurjar et al., 2024). When integrated with AI-driven automation, predictive insights enable the delivery of timely and personalized communications that strengthen customer engagement across touchpoints (Boozary et al., 2024).

Importantly, predictive analytics shifts marketing decision-making from reactive to anticipatory. By enabling firms to prepare and optimize actions prior to outcome realization, predictive models improve campaign performance and support more informed planning. As AI algorithms continue to evolve, the accuracy and strategic value of predictive analytics increase, reinforcing its role in enhancing the effectiveness of automated marketing processes and sustaining competitive advantage (Egorenkov, 2022).

In B2B settings, predictive analytics plays a critical role in identifying high-value leads, allowing email marketing efforts to concentrate on the most relevant prospects. AI-driven automation further enhances email marketing effectiveness by dynamically adjusting drip

campaigns based on lead behavior, ensuring that messages are delivered at the appropriate time and sequence, thereby reinforcing personalized customer experiences.

Despite its recognized importance, empirical research directly examining the effect of predictive analytics on AI-driven automation remains limited. Addressing this gap, the present study advances the following hypothesis:

Hypothesis 1 (H1): Predictive analytics positively influences AI-driven automation.

2.2. AI Driven Automation

Marketing automation refers to the use of technology and software to streamline, automate, and evaluate marketing tasks and processes – including customer segmentation, social media management, and email marketing – with the objective of improving efficiency, productivity, and customer engagement (Egorenkov, 2022; Gupta, Goel, 2024). Traditional automation systems execute predefined tasks efficiently; however, they lack the capacity for independent reasoning and adaptive decision-making. In contrast, AI introduces cognitive capabilities through machine learning algorithms that analyze large datasets to identify patterns, predict customer behavior, and generate data-driven recommendations in real time (Egorenkov, 2022).

Building on these capabilities, AI-driven marketing automation operationalizes predictive analytics by executing marketing tasks at scale and with greater intelligence. Automation simplifies complex processes such as audience segmentation, content creation, A/B testing, and campaign performance analysis. By autonomously processing and acting on data, machine learning algorithms reduce manual intervention and allow marketing teams to focus on designing meaningful interactions that sustain customer involvement and enhance customer experience (Egorenkov, 2022; Gurjar et al., 2024). In B2B contexts, for instance, AI-powered chatbots have been shown to improve customer experience by automating a substantial share of customer service interactions.

A prominent illustration of AI-driven automation is found in AI-enabled customer relationship management (CRM) systems. Leveraging machine learning, natural language processing, and predictive analytics, these systems analyze customer behavior, infer preferences, and automate routine activities such as email communication, inquiry handling, and lead prioritization. Beyond improving operational efficiency, such systems enable proactive and personalized communications – capabilities that have been consistently associated with higher levels of customer engagement, responsiveness, experience, and loyalty (Chatterjee et al., 2019; Penubelli, 2024).

Despite the increasing adoption of AI-driven automation across both B2B and B2C environments, empirical research directly examining its influence on customer engagement remains limited. Existing studies predominantly emphasize efficiency or personalization outcomes, often treating engagement as a secondary or implicit outcome rather than as a distinct construct. This gap motivates the present study to explicitly examine the role of AI-driven automation in shaping customer engagement. Accordingly, the following hypothesis is proposed:

Hypothesis 2 (H2): AI-driven automation positively influences customer engagement.

2.3. Customer Experience

Customer experience is a multidimensional construct encompassing customers' cognitive, emotional, behavioral, sensory, and social responses to a firm's offerings and

interactions (Witell et al., 2020). It reflects both deliberate and spontaneous reactions that emerge across multiple touchpoints throughout the customer journey (Becker, Jaakkola, 2020). With the increasing integration of artificial intelligence into marketing activities, customer experience is no longer shaped solely by human-led interactions but is increasingly influenced by data-driven, automated, and intelligent systems that mediate how customers interact with brands (Chintalapati, Pandey, 2022).

AI-powered personalization and engagement technologies further amplify the effects of predictive analytics and AI-driven automation on customer experience. Personalization systems leverage real-time data, machine learning, and advanced analytics to infer individual preferences and deliver tailored recommendations and promotional offers, thereby enhancing perceived relevance and experiential quality (Kumar et al., 2019; Bhuiyan, 2024). Complementing these capabilities, intelligent assistants – such as chatbots and voice-based agents—provide immediate, conversational support, streamline service processes, and simulate human-like interactions that foster trust and satisfaction (Vashishth et al., 2024; Huseynov, 2023). Empirical evidence further indicates that the integration of voice-enabled chatbots and AI-based sentiment analysis enhances customer experience by making interactions more natural, efficient, and emotionally responsive (Abdo, Yusof, 2023). Collectively, these technologies strengthen customer engagement while preserving access to human support, underscoring the role of interactive AI tools in shaping experiential outcomes.

In business-to-business (B2B) contexts, AI-driven personalization and engagement tools enable firms to manage complex, multi-actor buying processes by tailoring interactions to diverse decision-makers. In business-to-consumer (B2C) settings, these technologies facilitate highly relevant and timely experiences that enhance conversion rates, loyalty, and repeat purchasing behavior (Tung, Lan, 2024).

Although prior studies have examined predictive analytics, AI-driven automation, and customer engagement independently, limited research has investigated how these capabilities jointly influence customer experience. Existing work tends to emphasize isolated outcomes, overlooking the systemic interplay between predictive insights, automated execution, and interactive engagement mechanisms. This gap highlights the need for an integrated perspective that examines how these AI-enabled capabilities collectively shape customer experience. Accordingly, the present study proposes the following hypothesis:

Hypothesis 3 (H3): Customer experience is positively influenced by predictive analytics, AI-driven automation, and customer engagement.

Although the literature provides substantial evidence regarding the individual benefits of predictive analytics, AI-driven automation, customer engagement, and customer experience, existing research remains fragmented in three important respects. First, most studies examine these constructs independently rather than as interconnected elements of a broader AI-enabled marketing system. Second, prior research primarily focuses on direct effects, providing limited insight into the mechanisms through which predictive analytics influences customer experience through automation and engagement. Third, empirical evidence from telecommunications remains scarce despite the sector's high level of digitalization and intensive customer interaction. As a result, the processes through which AI-enabled capabilities jointly create customer value are not yet fully understood. To address these limitations, this study proposes an integrated conceptual model linking

predictive analytics, AI-driven automation, customer engagement, and customer experience within the telecommunications context.

3. METHODOLOGY

3.1. Research stimulus

The study was conducted within the context of a leading telecommunications company, i.e. Ooredoo Algeria, known for its innovative approach and commitment to digital transformation.

3.2. Research Design

This study adopts a mixed-methods research design that integrates qualitative and quantitative data collection techniques to provide a comprehensive understanding of the research phenomenon. An exploratory qualitative phase was conducted first to generate in-depth insights that informed the development of the survey instrument. This was followed by a quantitative phase involving the administration of structured questionnaires to both business and individual respondents. The sequential use of qualitative and quantitative methods enables methodological triangulation and enhances the robustness and validity of the findings.

3.3. Qualitative Phase

The qualitative phase aimed to uncover key perspectives and contextual insights related to the research topic, thereby strengthening the theoretical grounding of the study and informing subsequent empirical analysis. Semi-structured interviews were employed, as this format balances consistency across interviews with sufficient flexibility to explore participants' experiences in depth through open-ended and follow-up questions.

A total of four face-to-face interviews were conducted with employees from different departments within the focal firm who were directly involved in AI-powered services. Each interview lasted approximately 25 minutes. This approach facilitated the collection of rich, experience-based insights relevant to the role of predictive analytics and AI-driven automation in marketing and customer engagement contexts. To maintain focus, the interviews were organized around key dimensions:

- AI adoption in marketing: tools, strategies, and drivers.
- Organizational transformation: changes in roles, workflows, and collaboration.
- Impact on outcomes: effects on marketing performance and client relationships.
- Ethical and operational challenges: privacy, transparency, and implementation issues.
- Future outlook: participants' perspectives on AI's evolving role in marketing.

3.4. Quantitative Phase

3.4.1. Questionnaires Design

The questionnaire commenced with an introductory statement outlining the purpose of the study, assuring respondents of confidentiality and anonymity, and providing the option to complete the survey in English, French, or Arabic. A screening question was incorporated to ensure that only current customers of the firm participated in the study, as the questionnaire was distributed via social media platforms.

The instrument was structured into four sections. The first section comprised two items assessing respondents' awareness of the firm's use of artificial intelligence (AI) and

identifying the AI-based services most frequently used by customers. The second section consisted of ten items measuring three AI-related dimensions: AI-driven automation (two items), customer experience (six items), and predictive analytics (two items). The third section included seven items evaluating customer engagement, followed by an open-ended question soliciting respondents' recommendations. The final section collected demographic information.

A range of question formats was employed, including single-choice and multiple-choice questions, dichotomous (yes/no) items, identification questions, and seven-point Likert-scale statements, to enhance measurement reliability and respondent clarity.

Measurement items assessing predictive analytics, AI-driven automation, customer engagement, and customer experience were adapted from validated scales developed by Li et al. (2025) and were contextually refined to reflect the application of AI within the telecommunications sector.

3.4.2. Pilot testing and Final Questionnaire

Prior to online distribution, the questionnaire was pre-tested with a small convenience sample consisting of friends, relatives, and a limited number of the firm's employees to assess item clarity and overall question quality. The pre-testing phase, conducted over a one-week period, generated feedback that informed minor revisions to the instrument. Specifically, the Arabic and French versions of the questionnaire were refined to enhance translation accuracy, and illustrative examples were added to selected items to improve respondent comprehension.

3.4.3. Mode of Administration

The questionnaire was administered online, enabling participants to complete the survey at their convenience. All responses were collected anonymously to promote candid and unbiased participation.

3.4.4. Sampling method

A non-probability sampling approach was adopted due to practical constraints related to time, accessibility, and the specific characteristics of the target population. Judgmental sampling was employed to facilitate rapid access to individual consumers through readily available and easily reachable channels.

3.4.5. Preliminary Analysis

Data were collected through a single cross-sectional survey targeting business-to-consumer (B2C) participants, yielding over 300 responses. Prior to analysis, the dataset was screened and cleaned to remove incomplete or invalid responses, thereby ensuring the accuracy and reliability of the results. The statistical analyses that were conducted to test proposed hypotheses were performed using SPSS software by IBM version 26.

4. RESULTS

4.1. Questionnaire Analysis

A total of 258 valid responses were obtained from individuals using the firm's services. The sample reflected a diverse user base, providing a sufficiently robust foundation for subsequent analyses.

4.1.1. Test of Reliability

The internal consistency of the measurement scales was assessed using Cronbach's alpha. As reported in Table 1, all constructs exhibited reliability coefficients exceeding the commonly accepted threshold of 0.70, indicating satisfactory internal consistency.

Table 1. Questionnaire Reliability Test

Scale	Number of items	Cronbach's alpha
Customer Engagement	7	0.882
Customer Experience	6	0.707
Automation	2	0.755
Predictive Analytics	2	0.731

Source: By the authors.

Overall, the results demonstrate acceptable to high reliability across all scales. The customer engagement construct, in particular, exhibited strong internal consistency ($\alpha = 0.882$), while the remaining constructs met the minimum reliability criterion. These findings confirm that the measurement items consistently capture their respective latent constructs and are suitable for subsequent statistical analyses.

4.1.2. Data Preparation

Prior to hypothesis testing, composite variables were constructed by averaging the items corresponding to each latent construct. Specifically, AI-driven automation, customer engagement, predictive analytics, and customer experience were operationalized as mean scores of their respective measurement items. This procedure ensured internal consistency and prepared the dataset for regression analysis.

According to Tabachnick and Fidell (2007), when the proportion of outliers exceeds 10% of the sample, they should be “deleted, rescored, or the variable transformed.” Accordingly, multivariate outliers were identified using Mahalanobis distance and evaluated against the critical chi-square value ($\chi^2_{3,0.001} = 16.27$). Observations with Mahalanobis distance values exceeding this threshold were considered multivariate outliers and removed from the dataset. A total of 81 cases (31.39% of the initial sample) exceeded the critical value and were therefore excluded from the analysis. Although this procedure reduced the sample size from 258 to 177 respondents, the final sample remained well above the minimum requirements for multiple regression analysis. Following the removal of outliers, all hypotheses were re-estimated using the refined dataset, the distribution of which is illustrated in the scatterplot presented in Figure 1.

4.1.3. Hypothesis H1 Testing

To test Hypothesis H1, which posited that AI-driven automation is influenced by predictive analytics, a simple linear regression analysis was conducted. Predictive analytics was specified as the independent variable, while AI-driven automation served as the dependent variable).

Table 2. Coefficients – H1

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.515	0.446		7.878	0.001
1 Predict	0.276	0.084	0.24	3.27	0.001

Source: By the authors.

The regression model was statistically significant ($F = 10.692$, $p = .001$), indicating that predictive analytics significantly explains variation in AI-driven automation. The standardized regression coefficient ($\beta = .240$, $p = .001$) reflects a moderate positive relationship, suggesting that higher levels of predictive analytics usage are associated with greater degrees of automation. However, the model accounted for a relatively modest proportion of the variance in AI-driven automation ($R^2 = .058$), implying that additional factors beyond predictive analytics contribute to automation outcomes.

To sum up, hypothesis 1 is accepted. Predictive analytics has a significant positive effect on AI-driven automation, indicating that greater use of predictive analytics is associated with higher levels of automation. Although the model explains a relatively small portion of the variance ($R^2 = 0.058$), the relationship is statistically significant, suggesting that other factors also influence automation outcomes.

4.1.4. Hypothesis H2 Testing

A simple linear regression analysis was performed to test Hypothesis H2, which proposed that customer engagement is influenced by AI-driven automation. In this model, AI-driven automation served as the independent variable, while customer engagement was the dependent variable.

Table 3. Coefficients – H2

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.929	0.339		5.683	0.001
1 Predict	0.491	0.066	0.491	7.448	0.001

Source: By the authors.

The regression model was statistically significant ($F = 55.475$, $p < .001$), indicating that AI-driven automation has a significant effect on customer engagement. The standardized coefficient ($\beta = .491$, $p < .001$) suggests a moderate positive relationship, whereby higher levels of automation are associated with greater customer engagement. The model accounted for 24.1% of the variance in engagement ($R^2 = .241$), highlighting that additional factors may also contribute to engagement outcomes.

To summarize, hypothesis 2 is supported. AI-driven automation has a significant positive effect on customer engagement, with higher levels of automation associated with greater engagement. The model explains 24.1% of the variance in customer engagement, indicating a moderate relationship and suggesting that other factors may also contribute to engagement outcomes.

4.1.5. Hypothesis H3 Testing

Hypothesis H3 proposed that customer experience is significantly influenced by predictive analytics, AI-driven automation, and customer engagement. To examine this relationship, a hierarchical multiple linear regression analysis was conducted. Customer experience served as the dependent variable, while predictive analytics, AI-driven automation, and customer engagement were included as independent variables.

4.1.5.1. Data Screening

Prior to regression analysis, key assumptions were verified. With three predictors, the minimum required sample size of 45 cases (15 observations per variable) was satisfied, as the final dataset included 177 valid responses.

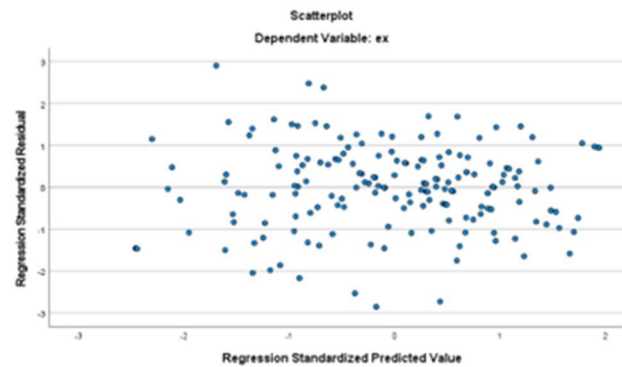


Figure 1. Outliers Test – H3

Source: By the authors.

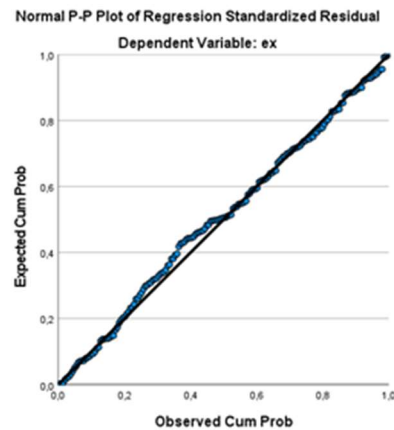


Figure 2. Residuals Normality Test – H3

Source: By the authors

The P–P plot of standardized residuals demonstrated that residuals were approximately normally distributed, with points closely aligned along the diagonal line (Figure 2). The Durbin–Watson statistic was 2.25, suggesting no autocorrelation. Multicollinearity was not a concern, with all tolerance values above 0.7 and VIF values below 2. These results confirm that the dataset met all key assumptions for reliable regression analysis.

4.1.5.2. Interpretation of the Model

4.1.5.2.1. The significance and usefulness of the model

Model 1, predictive analytics had a moderate positive effect on customer experience ($\beta = 0.287$, $t = 3.959$, $p < .001$). When AI-driven automation was added in Model 2, the effect of predictive analytics decreased to $\beta = 0.175$ ($t = 2.654$, $p = .009$), while automation demonstrated a strong positive influence ($\beta = 0.455$, $t = 7.050$, $p < .001$), indicating that customers perceive automation features as highly impactful, likely due to their efficiency and speed.

Table 4. ANOVA – H3

	Models	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.839	1	17.839	15.673	0.001
	Residual	199.186	175	1.138		
	Total	217.025	176			
2	Regression	62.098	2	31.049	34.871	0.001
	Residual	154.927	174	0.89		
	Total	217.025	176			
3	Regression	70.957	3	23.652	28.013	0.001
	Residual	146.068	173	0.844		
	Total	217.025	176			

Source: By the authors.

All three models were statistically significant ($p < .001$), confirming that the independent variables meaningfully predict customer experience. Each model's F-statistic exceeded the critical value, demonstrating both statistical significance and practical utility.

4.1.5.2.2. Interpretation of the Parameters

In the final model, customer engagement was included. Automation remained the strongest predictor ($\beta = 0.359$, $p < .001$), followed by engagement ($\beta = 0.237$, $p = .001$), with predictive analytics maintaining a smaller yet significant role ($\beta = 0.133$, $p = .045$). These findings suggest that while all three factors positively influence customer experience, automation and engagement exert the strongest effects.

4.1.5.2.3. Strength of association

The explanatory power of the model improved at each step, with adjusted R^2 values increasing from 0.077 (Model 1) to 0.278 (Model 2) and 0.315 (Model 3). Collectively, predictive analytics, AI-driven automation, and customer engagement explain approximately 31.5% of the variance in customer experience.

Based on the above, H3 is supported. The analysis indicates that customer experience is positively influenced by predictive analytics, AI-driven automation, and customer

engagement. Among these factors, automation and engagement exert the strongest effects, while predictive analytics plays a smaller yet significant role. Collectively, the three variables explain approximately 31.5% of the variance in customer experience, highlighting their meaningful contribution to enhancing customers' overall experience.

5. DISCUSSION

For the first hypothesis, predictive analytics was found to have a statistically significant influence on AI-driven automation, explaining 5.8% of the variance. Although this value is relatively low, it still indicates a meaningful relationship. This suggests that predictive analytics alone does not strongly determine automation, but it supports it by improving how customer data is used. When customer behavior, usage patterns, and preferences are analyzed more accurately, AI-powered systems are better able to automate marketing actions. The positive beta coefficient confirms that improvements in predictive analytics are associated with better performance of automated tools.

The second hypothesis showed a stronger relationship. AI-driven automation explained 24.1% of the variation in customer engagement, indicating a moderate to strong effect. This result highlights the importance of automation in shaping how customers interact with the brand. AI powered tools such as chatbots, personalized offers, recommendations, and self-service options make communication faster, more relevant, and easier for customers. The positive beta coefficient shows that as automation increases, customer engagement also increases. This confirms that automation plays a central role in improving customer engagement in a B-to-C setting.

The third hypothesis examined the combined effect of predictive analytics, automation, and engagement on customer experience using hierarchical regression. Predictive analytics alone explained 7.7% of the variance in customer experience, showing a weak yet positive influence. When automation was added, the explained variance increased to 27.8%, indicating that automation significantly strengthens the model. After including customer engagement, the explained variance reached 31.5%, showing that engagement further improves the explanation of customer experience. These results demonstrate that customer experience is better explained when data analysis, automation, and engagement are considered together rather than separately.

Overall, the statistical findings show that customer engagement has the strongest direct contribution to customer experience, followed by automation, while predictive analytics plays a supporting role. Overall, the numerical results show that customer engagement has the strongest direct contribution to customer experience, followed by automation, while predictive analytics plays a supporting role. This can be explained by the fact that engagement represents the customer's direct interaction with the brand through communication, responsiveness, and personalization, which are central to how experience is perceived. Automation and predictive analytics operate more in the background, enabling these interactions rather than shaping the experience directly. This confirms that AI technologies create the most value when they work together and translate data-driven insights into interactive and personalized customer experiences.

Taken together, these findings reinforce the view that AI creates customer value through an integrated process rather than through isolated technological capabilities. This is consistent with prior studies emphasizing the complementary roles of predictive analytics, AI-driven automation, and personalized engagement in enhancing customer interactions and experiential outcomes (Kumar et al., 2019; Egorenkov, 2022; Huseynov,

2023; Tung, Lan, 2024). While previous research has largely examined these capabilities independently, the present findings demonstrate that their combined influence provides a more comprehensive explanation of customer experience. From a theoretical perspective, the results support the Marketing 5.0 framework (Kotler et al., 2021) and customer experience theory (Becker, Jaakkola, 2020), suggesting that predictive analytics generates actionable customer insights, automation translates these insights into timely and personalized actions, and customer engagement serves as the primary mechanism through which customers perceive value. Consequently, the study extends the existing literature by providing empirical evidence that the effectiveness of AI in enhancing customer experience depends not only on technological sophistication but also on the successful integration of analytical, operational, and relational capabilities.

6. CONCLUSIONS

This study examined the influence of predictive analytics, AI-driven automation, and customer engagement on customer experience. The findings confirmed all three hypotheses. For the first one, predictive analytics had a statistically significant effect on automation, with a moderate R-squared value (5.8%), showing that better use of customer data improves the performance of AI-powered processes.

This aligns with the literature review, where predictive analytics is described as a foundation for data decision making and operational efficiency (Noil, 2024; Mecharla et al., 2024). They also provide empirical evidence for the underexplored relationship between predictive analytics and automation in marketing, showing how insights from predictive analytics help guide automated processes, improving personalization and timing of customer interactions (Egorenkov, 2022).

Hypothesis 2, which suggests that AI-driven automation influences customer engagement, was also supported. In the B-to-C survey, automation accounted for 24.1% of the variation in engagement, reflecting a strong effect. These results show that automation technologies help improve customer interaction by making communication more responsive, timely, and tailored. These outcomes align with prior studies emphasizing that AI-powered automation enhances operational efficiency and enables personalized, proactive communications through tools such as CRM systems and chatbots (Egorenkov, 2022; Chatterjee et al., 2019; Penubelli, 2024). Overall, the findings provide empirical support for the theoretical link between automation and engagement, confirming that AI driven processes help firms improve customer engagement.

The third hypothesis, which examines the combined influence of predictive analytics, automation, and engagement on customer experience, was also supported. In the B-to-C survey, the three variables explained 31.5% of the variation in customer experience, confirming a solid moderate effect. These results suggest that a synergistic approach, where data analysis, automation, and engagement work together, shapes how customers experience their interactions with the brand. These findings align with previous studies suggesting that highlight the individual importance of predictive analytics and AI powered automation in providing a more personalized experience, along with interactive tools such as chatbots that boost engagement, all of which contribute to improving customer experience (Egorenkov, 2022; Huseynov, 2023; Kumar et al., 2019). However, the existing literature mainly examines these capabilities separately. Very few studies investigate how predictive analytics, automation, and engagement work together as one integrated system, which created a clear research gap. The current results therefore contribute new evidence

by demonstrating that the combined effect of these three AI capabilities has a meaningful impact on customer experience.

Overall, the study demonstrates that AI-driven customer experience works best when these capabilities are combined rather than applied individually. Predictive analytics provides the data foundation, automation translates insights into actionable processes, and engagement tools convert actions into meaningful customer interactions. This integrated system improves satisfaction, loyalty, and long-term value for customers.

This study faced several limitations that should be acknowledged. First, the small sample sizes and use of non probability sampling methods may have introduced selection bias, limiting the generalizability of the results. The research also focused on only two AI constructs predictive analytics and automation and two marketing constructs customer engagement and experience thus providing a partial view of AI's broader marketing impact. Moreover, the survey instruments used may have simplified the complex nature of AI technologies, potentially overlooking more nuanced aspects. The cross sectional design further limits the ability to observe changes over time, and the reliance on self reported data could introduce bias or misinterpretation of AI-related concepts by respondents.

Future studies should expand this research by examining AI-driven marketing in a B-to-B context, where decision-making processes, customer relationships, and performance goals differ from consumer markets. Research could explore how predictive analytics and automation support lead management, account-based marketing, and long-term relationship building between firms.

In addition, future studies should broaden the scope of AI and marketing variables by including aspects such as personalization, customer loyalty, and trust to gain a more comprehensive understanding of AI's marketing influence. Longitudinal research designs are recommended to examine how AI adoption impacts customer behaviour and business outcomes over time.

Comparative studies across industries, organizations, and countries would also provide valuable insights into contextual differences and best practices. Further research could investigate how organizations internally use AI for strategic decision-making and operational efficiency. Moreover, adopting context specific measurement tools can help capture the unique features of AI applications in different market settings.

Lastly, future investigations should explore the ethical and social implications of AI adoption, including privacy, transparency, and fairness, to ensure responsible and sustainable AI integration in marketing

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Anna KOWALCZYK-KROENKE¹

HATE IN ORGANIZATIONS – PROBLEM OR ILLUSION? THE ESSENCE, SPECIFICITY AND CONDITIONS AS PERCEIVED BY POLISH MANAGERS

The aim of the research presented in this paper was to empirically identify organizational and psychosocial factors influencing the occurrence of hate in organizations. The study employed the individual in-depth interview (IDI) method, semi-structured with a standardized list of required information. The original interview questionnaire contained a total of nine open-ended questions, which participants answered during individual meetings with the researcher. The results demonstrate the diverse organizational and psychosocial factors that contribute to the development of hate within organizations. They also present key managerial competencies essential for managing this phenomenon in the workplace.

Keywords: workplace emotions, organizational behavior, managerial perceptions, interpersonal conflict, hate.

1. INTRODUCTION

Hate has many faces, and a clear definition that fully captures the essence of the phenomenon remains unclear. However, there is a spectrum of specific actions, behaviors, attitudes, and beliefs that, although often implicit, are strongly characterized by aggression, hostility, and violence. Their essence focuses on inflicting suffering (very often psychological, although not excluding physical violence), humiliation, lowering self-esteem, and devaluation of the individual. The multiplicity of forms and the scale of the phenomenon are undergoing transformations, and its intensification in many areas of human functioning increasingly raises questions about where hate truly begins and the specificity of the environments in which it is often marginalized or identified exclusively with mobbing.

However, hate is more. Hate in public spaces is most often associated with cyberbullying, online hate, and aggressive online behaviors in various forms (Citron, 2015;

¹ Anna Kowalczyk-Kroenke, University of Lomza, Poland; e-mail: e-mail: anna.kowalczyk.wawa@gmail.com. ORCID: 0000-0002-4757-9318.

Jaishankar, 2008). With the growing popularity of digital communication, hate speech has become a more common issue. Addressing this problem is complicated by the variability and ongoing evolution of language, which make it challenging to establish clear definitions and reliable classifications of hateful content (Geetanjali et al., 2025). Hate speech is typically associated with offensive language motivated by stereotypes and prejudice toward particular groups, whereas cyberbullying is characterized by intentional and repeated online actions intended to inflict harm on an individual (Maste et al., 2025). Despite the wide range of hateful behaviors, existing research reveals conceptual inconsistencies, a strong focus on the Global North, and significant gaps in studies involving underrepresented populations and diverse research methodologies (Khaleghipour et al., 2025). During and immediately after the Covid-19 pandemic, when collaboration within virtual teams became an integral part of many organizations, this problem took on a new dimension, as work environments began to change significantly, providing opportunities to conceal pathological behavior. Social and cultural changes, along with the far-reaching uncertainty and instability in Eastern Europe, also provided a backdrop for the development of broadly understood hateful attitudes, which can be fueled by fear. However, in the common understanding, hate does not refer exclusively to online activities, with which it is most often associated; its definition and scope extend much further.

An analysis of the literature suggests a distinct lack of in-depth empirical research on hate, and its very nature remains an under-researched and fragmented area, especially in the context of work environments. This gap applies not only to individual groups (e.g., employees, managers) but also to societies and cultures. Fischer et al. (2018) indicate that hate has never been perceived as a standard emotion, which is why its popularity in psychological research is relatively low. Most often, the phenomenon of hate is analyzed in the context of violent behavior in the online space, with which this concept is identified (Kaakinen et al., 2020; Megersa, Minaye, 2023) and also in relation to young people (Naderer, Wendt, 2025).

Existing workplace research has highlighted that leaders may still experience hate even in organizations that actively implement measures to reduce it (Sharma and Kulshreshtha, 2023). Research has also examined the impact of hate on organizational crisis management, highlighting consequences such as operational disruption, reputational damage, changes to short- and long-term strategic initiatives, and increased attention from internal and external stakeholders (Kaczmarek-Śliwińska, 2020). Importantly, most of the research on workplace hate focuses on Western countries, with relatively little attention paid to Eastern societies and cultures (Mei-Jun Huang, 2024). This suggests that this area of research still holds significant potential, as many studies are conducted selectively and are often limited in scope. The specific nature of the phenomenon, its determinants, and potential consequences for professional functioning are very difficult to grasp due to the multitude of factors (including the most difficult to study – individual predispositions – mental and emotional), but also due to the significant variation in how people define and understand the concept itself.

2. DEFINITIONAL APPROACHES TO HATE

Hate is difficult to define consistently, but it is often characterized as a strong negative attitude toward particular individuals that leads to attempts at their exclusion, whether through violence or more subtle forms of avoidance (Mendez, 2025). Hate-motivated

behaviors span a continuum from microaggressions to criminal acts (Cramer et al., 2023) and can often take on extremely subtle dimensions, invisible even to experienced observers. In this context, the role of managers leading teams is crucial not only for the efficient and effective implementation of business goals, but also for creating, developing, and maintaining relationships within organizations. The quality of these relationships has a significant impact on organizational culture and innovation, which in turn affects long-term competitiveness and growth. Research suggests that hatred commonly co-occurs with other negative emotional states. It is more likely to arise when individuals appraise events as obstructing their goals or interests, or when they perceive others' behavior as unjustified, unfair, morally inferior, or ethically deficient (Fischer et al., 2018, cited in Haidt, 2003; Rozin, 1999). In real-life work environments, haters violate workplace norms and the principle of interpersonal harmony (Mei-Jun and Huang, 2024). Because hostility in speech is closely tied to the speaker's subjective and emotional intentions, its interpretation varies, resulting in ongoing difficulties in defining the concept (Waldron, 2012).

In the literature, it is difficult to find a clear definition (Kindermann, 2023) and a common conceptual framework for hate crimes, hate incidents, and hate speech. Research in this area is constrained by the absence of a unified conceptual framework. Inconsistent definitions of hateful behaviors and differing approaches to identifying hate undermine the comparability and reliability of available data (Vergani et al., 2024). The variability in how hate is expressed complicates efforts to establish universal definitions and clear classification criteria. While its exact boundaries remain subjective, researchers can identify common language patterns, communication strategies, and behaviors associated with hateful expression (Trzaskowski, 2023). While linguistic aggression is not an inherent feature of all hateful expressions, it is commonly employed to communicate negative evaluations. Within this context, evaluative language fulfills primarily expressive and persuasive functions (Trzaskowski, 2023).

According to Ołtarzewska and Przybysz, hate can be understood as a form of interpersonal violence expressed through harmful statements designed to negatively affect others. Their research highlights the connection between hate speech and individual forms of aggression (Ołtarzewska, Przybysz, 2024). Despite efforts to address hate crimes at the European level, no consistent definition has been established by EU institutions or the Council of Europe. This results in considerable variation in how individual member states understand and classify hate crimes (Schweppe, 2021). So, what are they, and what defines their boundaries?

3. FACTORS OF HATE – OUTLINE OF THE PROBLEMS

The emergence of hate speech can be influenced by a combination of personal, emotional, and social factors. These include individual frustration, psychological tension, the need for emotional release, and attempts to gain influence or acceptance within a group. While hate speech may sometimes reflect opposition to perceived injustices or personal grievances, the reinforcement gained from engaging in such behavior is particularly associated with individuals displaying limited empathic capacity (Peisert, 2004). Rew and Ferns (2005) point to factors that can trigger antisocial behavior and thus lead to certain pathological behaviors. These include fear and anxiety, past experiences both personal and at work, lack of self-confidence, lack of self-esteem, personal problems, misunderstandings, lack of communication, illness, pain, drugs, and alcohol.

The report “The Cost of Violence/Stress at Work and the Benefits of a Violence/Stress-Free Working Environment” emphasizes that sources origins are multifaceted and influenced by social, cultural, economic, and psychological conditions. The transformation of labor markets, including increased workforce diversity, job insecurity, and unfavorable employment conditions, may contribute to interpersonal conflicts. Furthermore, differences among employees related to demographic and personal characteristics can become sources of tension when organizations lack appropriate inclusion and management strategies (Hoel et al., 2001). The structure of the labor market, particularly occupational divisions based on gender, influences the forms of violence present in specific professional contexts. At the same time, gender differences may affect how individuals interpret violent behaviors and choose strategies for responding to them (Estrada et al., 2010).

In this context, it can be assumed that the factors causing hatred, violence, and aggression have both a micro and macro dimension. They may relate to the specific psychophysical characteristics of a given person – their needs, fears, frustrations, ambitions – but also to certain social conditions, situational circumstances, and global transformations that trigger certain behaviors and attitudes. Very often, hate, especially in an organizational context, is understood as mobbing. However, hate is a much broader phenomenon, with more fluid boundaries. It often extends beyond the work environment and escalates much further – including when a person is no longer part of the organization but still pursues professional fulfillment. Hate speech can also be incidental, while mobbing focuses on persistent, long-term humiliation, devaluation, and ultimately, exclusion from professional activity.

Research conducted in this area primarily focuses on the causes, consequences, and methods of combating mobbing (Alper Ay, 2025). Research on workplace aggression has evolved considerably, resulting in diverse definitions, theoretical approaches, and analytical frameworks within organizational studies. The growing attention given to collective forms of aggression in the workplace during the 1980s and 1990s stimulated academic debate and contributed to the refinement of related concepts (Popa, 2025). Aggression in the workplace takes on a variety of forms, significantly complicating its identification, prevention, and search for solutions.

Despite variations in how these phenomena are defined, workplace mobbing, intimidation, and harassment are widely recognized as harmful behaviors that can impair organizational effectiveness and employee welfare. Their impact may occur through direct or indirect forms of aggression, creating obstacles to a healthy work environment and long-term professional security (Popa, 2025). In light of the presented literature review, the question arises not only about the underlying factors that contribute to the occurrence of hate in organizational environments, but also about the specificity of environments that are particularly susceptible to the development of pathologies in this regard.

In this context, the analysis of the literature leads to the following research questions:

1. Which organizational and psychosocial factors contribute to the occurrence of hate in teams/organizations from the perspective of managers?
2. What are the specific characteristics of the organizational environment in which hate develops among employees and managers from the perspective of managers?
3. What actions, attitudes, and beliefs of managers determine effective counteracting of hate in organizations, as assessed by managers?

4. RESEARCH METHODOLOGY

The aim of the research presented in this paper was to empirically identify organizational and psychosocial factors influencing the occurrence of hate in organizations. The study also examined the characteristics of organizational environments that may increase susceptibility to this phenomenon.

Due to the exploratory nature of the research problem and the sensitive character of the phenomenon under investigation, a qualitative research approach was adopted. Data were collected using individual in-depth interviews (IDI) conducted in a semi-structured format. This approach enabled participants to describe their experiences, perceptions, and interpretations of hate in the organizational context while allowing the researcher to explore emerging issues in greater depth.

The interview consisted of nine open-ended questions developed based on the research objectives and relevant literature. The questions focused on participants' understanding of hate, factors contributing to its occurrence in organizations, organizational conditions influencing this phenomenon, and possible consequences for employees and organizations. Additional probing questions were used when necessary to clarify participants' statements and obtain more detailed insights.

Each interview was conducted individually and lasted approximately 70 minutes on average. The interviews were carried out between October and December 2025 through face-to-face meetings. With participants' consent, the collected material was recorded and transcribed for further analysis. All transcripts were anonymized to ensure confidentiality.

The collected data were analyzed using thematic analysis. The analytical process involved several stages: familiarization with the interview material, initial coding of significant statements, grouping related codes into broader categories, and identifying key themes emerging from participants' narratives. The analysis focused not only on identifying recurring factors but also on exploring relationships between categories and understanding the mechanisms through which organizational and psychosocial conditions may contribute to the occurrence of hate.

To enhance the credibility of the findings, the coding process was conducted systematically, and emerging categories were reviewed to ensure consistency with the collected data. The qualitative approach allowed for an in-depth examination of respondents' perspectives, which would be difficult to capture through quantitative methods, particularly given the sensitive nature of the research topic.

5. CHARACTERISTICS OF THE STUDY SAMPLE

The adopted research objective dictated the purposive selection of interviewees. The key inclusion criterion was the level of position held (role performed within the organization). Twenty-four respondents holding independent senior management positions in companies from the following sectors were invited to participate in the study: industry, education, IT, electronics, public administration, and retail, recognizing that their knowledge in the studied area could be crucial for understanding the essence of the phenomenon in organizations. The respondents were employed in medium-sized companies (50-250 employees) and large companies (251 and more) with Polish and foreign capital (branches of foreign companies located in Poland). The study participants included 14 women and 10 men, aged 35 to 50, all with higher education and over 12 years

of experience. The study was conducted between October and December 2025, during in-person, face-to-face meetings.

6. ORGANIZATIONAL AND PSYCHOSOCIAL FACTORS IN THE CONTEXT OF THE DEVELOPMENT OF HATE IN ORGANIZATIONS – OWN RESEARCH RESULTS

The starting point for the analysis was collecting data on behaviors, attitudes, and actions that, in the opinion of managers, they identify as hate in organizations. Among the dominant categories of hate in organizations, respondents identified public criticism, providing negative feedback to people who are not affected by it, gender discrimination, criticism without substantive arguments, prolonged harassment, ridicule, fueling a negative atmosphere, judging others, giving opinions, envy, deliberate rejection, deliberate withholding of information, sharing false information, exclusion from a group, and gossiping on company messaging platforms.

Although respondents identified a wide range of hate-related behaviors, these actions do not appear to represent isolated incidents. Instead, they can be grouped into broader patterns reflecting different forms of interpersonal hostility. The first group includes behaviors aimed at publicly undermining an employee's dignity or professional credibility, such as public criticism, ridicule, and negative feedback delivered in the presence of others. The second group encompasses behaviors leading to social exclusion, including withholding information, deliberate rejection, and exclusion from workplace interactions. A third group consists of behaviors targeting personal identity or social standing, such as discrimination, gossip, and unjustified judgments. This pattern suggests that managers perceive hate primarily as a process of weakening an employee's position within the social environment of the organization rather than as single hostile acts.

This approach to the problem reveals its complex nature and the multitude of actions that, in the opinion of managers, can be interpreted as manifestations of hate. Respondents particularly emphasized the aspect of evaluation and feedback. The method of assessment and the type of communication used to conduct it are particularly important.

The identified patterns demonstrate that managers conceptualize hate in organizations as a multidimensional phenomenon encompassing not only overt acts of aggression but also more subtle forms of social exclusion and reputational harm. This broader understanding highlights the complexity of hate as an organizational process rather than a collection of isolated negative behaviors.

According to the respondents, feedback, especially negative feedback provided with the involvement of outsiders, can be perceived as a form of hate speech, as it often highlights and publicizes employee weaknesses, impacting the overall assessment of people within the organization, as well as their attitudes and willingness to cooperate.

This finding suggests that respondents distinguish between criticism itself and the way it is communicated. Constructive feedback delivered privately is not perceived as hate; however, when criticism becomes public, humiliating, or intended to undermine the employee's status, it is interpreted as hate speech. Therefore, managers appear to define hate primarily through the social consequences of communication rather than through the mere expression of negative opinions.

The next stage of the research examined the specific organizational and psychosocial factors that, in the respondents' opinion, may contribute to the occurrence of hate speech in organizations. The collected data indicates significant diversity in this area, related to

factors directly related to the culture and functioning of the organization, as well as the psychosocial dimension. Among the organizational factors, diversity was highlighted primarily. While diversity can be a team's strength, it can also be its greatest weakness if implemented and managed improperly. The diversity of individual team members can trigger hostility, according to the respondents, even if it doesn't directly concern gender, age, race, or religion, but rather aspects related to lifestyle, values, and personality. Organizational culture was also identified as an important factor that determines certain attitudes and behaviors within an organization.

Organizational factors also included a lack of adherence to “unwritten policies”, such as team members eating meals at specific times and in specific locations, and in specific groups.

Although these organizational factors appear diverse, they point to a common underlying mechanism related to the regulation of interpersonal relationships within the workplace. Diversity itself was not described by respondents as inherently problematic; rather, it became a potential source of hate when organizational norms failed to support inclusion or when differences were interpreted as threats to group cohesion. Similarly, organizational culture and adherence to informal workplace norms seem to shape the boundaries of acceptable behavior. These findings suggest that organizational factors do not directly generate hate but create conditions that may either facilitate or inhibit its emergence, depending on how interpersonal differences and informal norms are managed.

Psychosocial factors included low self-esteem (a factor that appeared in the responses of all surveyed respondents), envy of achievements, lack of support within the organization, lack of personal success, a sense of injustice, lack of psychological safety, managerial acceptance of certain behaviors, and undervaluation of competencies. Figure 1 presents the dominant organizational factors, and Figure 2 presents the psychosocial factors that, according to managers, contribute to the development of hate speech in organizations.



Figure 1. Dominant organizational factors influencing the development of hate in an organization – managers' perspective

Source: Own study.

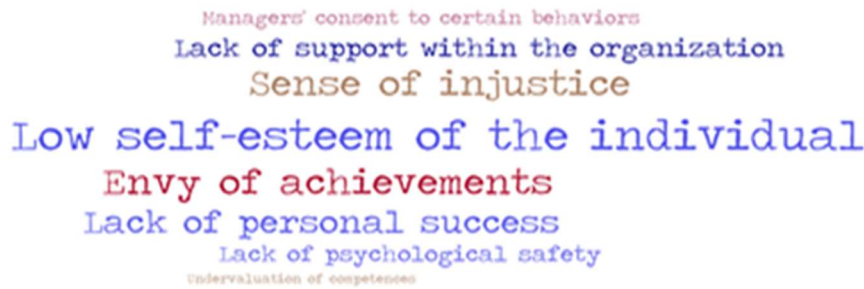


Figure 2. Dominant psychosocial factors influencing the development of hate in an organization - managers' perspective

Source: Own study.

Interestingly, most psychosocial factors identified by respondents reflect threats to an individual's self-concept rather than objective organizational conditions. Low self-esteem, envy, frustration, and perceived injustice all indicate situations in which employees experience diminished personal value or social status. This suggests that hate may function as a compensatory response aimed at restoring one's self-image by diminishing the position of others.

This part of the study also examined which employee needs (as well as attitudes and beliefs) may contribute to the occurrence of hate within the organization, and therefore, what lies at the root of specific actions. According to the respondents, these include fear, the need for security, the need for stability, aversion to change, the need for achievement, a sense that hate can strengthen the employee's position, and the need for self-esteem and success.

A noteworthy observation is that many of the identified needs are defensive rather than growth-oriented. The predominance of security, stability, and fear suggests that hate may arise not only from interpersonal hostility but also from perceived threats to one's position within the organization. In this sense, hate appears to represent a coping mechanism triggered by uncertainty and competition rather than solely an expression of aggression.

Respondents also emphasized the importance of self-esteem, frustration, and burnout, as demonstrated by the following statements (Table 1):

Table 1. Employee Needs and the Development of Hate Speech in an Organization – Managers' Perspective

“...always low self-esteem, insecurities, the desire for rapid promotion, but the root cause is always jealousy...” <i>Marketing Manager, retail industry, polish company</i> “...burnout, personal issues, because it's impossible to separate personal life from work, lack of clear goals at work, which triggers frustration...” <i>Deputy Director, IT industry, international company</i> “...they try to achieve a higher promotion, the need for achievement, jealousy – these are the needs that can trigger hate speech” <i>Deputy Director, education industry, polish company</i>
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Source: Own study.

7. THE SPECIFICITY OF ORGANIZATIONAL ENVIRONMENTS AND THE DEVELOPMENT OF HATE ATTITUDES – MANAGERS PERSPECTIVES – OWN RESEARCH

When analyzing the specificity of environments particularly susceptible to hate behavior, it should be noted that the organizational atmosphere and climate are particularly important. Respondents believe that competitive environments, with high performance pressure and a strong focus on high performance, also create a breeding ground for many dysfunctional behaviors. The collected empirical material presents responses that emphasize high expectations not only among employees but also managers, creating an atmosphere of a “rat race” where the only winner is the one who achieves the highest score. The problem of competency mismatch is also significant, effectively reducing the quality and efficiency of work. In this context, identifying employee potential, their competencies, and skills in relation to their professional roles is particularly important for maintaining occupational health.

Respondents also pointed to dispersed organizations that have not yet undergone transformation and whose methods of operation fall far short of the expectations and established standards of the contemporary market. Ignorance of ethics and an authoritarian approach to management, which is often equated with efficiency, were also highlighted.

Although respondents identified a variety of organizational characteristics, these factors appear to converge around a common underlying mechanism: environments that limit interpersonal trust, open communication, and perceived fairness are viewed as particularly conducive to the emergence of hate. High performance pressure, rigid hierarchies, competency mismatches, and authoritarian leadership all reduce opportunities for constructive dialogue while increasing employees' perceptions of competition and threat. Rather than acting independently, these organizational characteristics seem to reinforce one another, creating conditions in which hostile behaviors become more likely. Selected responses from respondents are presented in Table 2.

Table 2. Specificity of organizations susceptible to hate – managers' perspective

“...very traditional organizations that haven't undergone transformation, that don't follow market standards, organizations managed with a heavy hand, dictatorial, there's no room for dialogue, there's no relationship, there's no openness...” <i>Vice President, IT industry, international company</i> “...high stress, demanding goals, a bad example coming from the top, ethics not enforced, ignorance of organizational rules...” <i>HR Manager, industry, international company</i> “...dispersed organizations, where it's difficult to capture this phenomenon, hate and mobbing have very thin boundaries. If hate occurs in a large organization, it's harder to capture. Organizations with a high hierarchy, little openness to people, and a lack of trust. Where there is openness and trust in managers, the topic surfaces more quickly; where it doesn't, it may never surface”. <i>HR Director, retail, international corporation</i>
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Source: Own study.

The respondents' statements consistently indicate that hate is perceived as a consequence of organizational systems rather than merely individual dispositions. Across different industries, managers emphasized structural characteristics such as centralized decision-making, weak ethical standards, limited dialogue, and excessive performance pressure. These findings suggest that organizational design may either amplify or buffer employees' negative emotions. Importantly, respondents rarely described hate as an

isolated interpersonal conflict; instead, they associated it with broader organizational environments that normalize hostility or discourage constructive conflict resolution. Interestingly, the organizational characteristics identified by respondents can be grouped into two broader organizational patterns. The first reflects control-oriented organizations characterized by hierarchy, authoritarian leadership, and limited employee voice. The second represents competition-oriented organizations in which excessive performance pressure and internal rivalry dominate interpersonal relations. Although these patterns differ in their management philosophy, both appear to increase employees' perceptions of threat and reduce opportunities for supportive social interactions, thereby creating favorable conditions for hate-related behaviors.

When considered together with the findings presented in the previous section, these results suggest that hate in organizations cannot be explained solely by individual predispositions or isolated workplace behaviors. Instead, the emergence of hate appears to reflect an interaction between organizational context (e.g., competitive climate, leadership style, ethical standards), employees' psychosocial experiences (e.g., insecurity, perceived injustice), and underlying psychological needs. This integrated perspective highlights that organizational environments do not directly produce hate; rather, they shape the conditions under which individual vulnerabilities are more likely to translate into hostile workplace behaviors.

8. MANAGERS' ACTIONS AND ATTITUDES IN COMBATING HATE IN ORGANIZATIONS

The next part of the study analyzed which managerial competencies determine the effective management of hate in organizations and teams, if it does occur, and how managers can counteract hateful behavior. Analysis of the empirical material indicates that the scope of actions can be very diverse, but it is important to consider the specifics of a given organization (its culture, size, history, leadership style, etc.).

Managerial competencies perceived as essential in addressing pathological phenomena in organizations (including hate) include: managerial courage, "calling a spade a spade," communication skills, emotional intelligence, openness to learning how to deal with problems, building relationships, openness to people, understanding the need for fairness, the ability to provide feedback, responding at early stages of a problem, decision-making, understanding employee needs and motivations, transparency, vigilance, the ability to react quickly, good team knowledge, and empathy. Figure 3 presents the key categories of managerial competencies necessary to address hate in organizations and teams.

Although respondents identified numerous managerial competencies, they do not appear to be of equal importance or function independently. The findings suggest that these competencies can be grouped into three complementary dimensions. The first comprises interpersonal competencies, such as communication, empathy, relationship building, and emotional intelligence, which enable managers to recognize and address emerging interpersonal tensions. The second includes ethical competencies, reflected in fairness, transparency, and managerial courage, which establish behavioral standards within the team. The third dimension involves managerial and operational competencies, including decision-making, vigilance, rapid response, and providing feedback, which enable managers to translate values into concrete organizational practices. This pattern suggests that effective hate prevention depends not on isolated competencies but on their simultaneous application.



Figure 3. Key managerial competencies in the context of dealing with hate in organizations – managers' perspective

Source: Own study.

When reviewing methods and approaches to counteracting hate in organizations, respondents focused on: decisive responses to hateful behavior – from both managers and employees. In the opinion of the respondents, it is the team that ultimately decides what will be accepted and considered part of the culture. Education in shaping and understanding appropriate behavior, as well as identifying pathological behavior, was highly rated. Clear boundaries and fairness, which again resonate not only as a significant factor but also as a defined approach to people. The lack of public criticism and the related ability to provide feedback while maintaining the one-on-one principle, which allows for maintaining human dignity even in the face of failure. Building an atmosphere of trust that fosters openness between people and increases the chance of quick, appropriate responses to pathologies within the organization. Understanding what hate is and its consequences for shaping the organizational climate, its atmosphere, relationships, and effectiveness is also crucial. Respondents strongly emphasized that being close to and with people strengthens teams, hence the leadership styles adopted are crucial.

The proposed actions indicate that respondents perceive hate prevention primarily as a proactive rather than reactive managerial process. Rather than focusing exclusively on responding to incidents after they occur, managers emphasized creating organizational conditions that reduce the likelihood of hate emerging. Fair communication, psychological safety, trust, and education were viewed as mechanisms that strengthen interpersonal relationships and encourage the early identification of conflicts before they escalate into hate-related behaviors.

Diversity also remains key – mixing people across projects and tasks, and striving not to work consistently in a single, homogeneous team. Managers believe that these initiatives can foster integration, opening up space for relationships while simultaneously protecting where the balance is disrupted. Taken together, these findings suggest that managers perceive effective hate prevention as a multilevel process involving individual competencies, interpersonal relationships, and organizational practices. Managerial competencies alone appear insufficient unless they are embedded in organizational cultures

characterized by trust, fairness, and open communication. Similarly, organizational initiatives such as team integration or diversity management are likely to be effective only when supported by leaders who consistently reinforce respectful interpersonal norms.

9. DISCUSSION

The issue of hate and hatred in relationships between organizational members is an extremely rich field for scientific exploration, but the sensitivity and specificity of the problem mean that grasping its depth poses numerous psychological, emotional, organizational, and ethical challenges. The research fragments presented in this paper reveal only a small aspect of the problem – taking into account potential organizational and psychosocial factors. They provide fragmentary information on the sources and underlying causes of pathological behaviors that bear the hallmarks of hate. The paper also presents a range of competencies with which respondents identify skills essential for coping with hate in organizations. Methods and approaches already used in organizations and perceived as effective by managers are also analyzed. The collected empirical material reveals a fairly consistent assessment of managers regarding the factors and causes of pathological phenomena, with a particular emphasis on hate. Importantly, none of the respondents indicated that hate is limited to cyberbullying, thus not limiting the analyzed phenomenon solely to the virtual sphere. In the opinion of the surveyed managers employed in Poland, the boundaries of hate are broad and at the same time quite fluid. Individual differences in terms of resilience and sensitivity remain crucial. Taken together, the findings suggest that hate should not be understood as an isolated interpersonal behavior but rather as a dynamic organizational process emerging from the interaction of organizational conditions, employees' psychosocial experiences, and individual psychological needs. This interpretation extends previous discussions of workplace hate by emphasizing that organizational context shapes not only the occurrence of hate-related behaviors but also the mechanisms through which they develop and become normalized.

Research shows that, on the one hand, diversity in teams and organizational inclusiveness are strongly resonant in social and professional settings as a strength, effectiveness, and efficiency (Allen et al., 2007). At the same time, what is emphasized as a value can be a source of tension, conflict, violence, pathology, and ultimately turn into a weakness (Akpapuna et al., 2020). Individuality and originality can therefore be, on the one hand, a potential source of innovation and creativity, but also a trigger for aggression of varying intensity and complexity. The present findings help explain why previous studies have reported inconsistent effects of diversity. Respondents did not perceive diversity itself as problematic; rather, they associated hate with situations in which diversity was unsupported by inclusive leadership, clear communication, and organizational norms promoting fairness. This suggests that diversity operates as a contextual condition whose organizational consequences depend on the quality of management rather than on demographic differences alone.

The hateful person's focus is on elimination and exclusion from the group, and these actions are most often driven by fear, jealousy, uncertainty about one's own position, and lack of personal success.

This raises many questions about how to build diversity in organizations, how to strengthen it, understand it, and, above all, how to match team members' competencies, skills, and knowledge to their character profile, personality, temperament, style of functioning, and needs to achieve team integration. Research shows that diversity, which

is currently intensively promoted in business, is perceived and implemented at a rather general level and therefore often remains ineffective (Waldman, Sparr, 2023). Many actions can be characterized as more symbolic than substantive (Allison, 1999).

The positive effects of diversity depend on how well it fits an organization's specific characteristics and requirements. Olsen and Martins (2012) emphasize that when diversity practices are introduced without considering organizational needs, values, norms, and available resources, they may produce counterproductive outcomes by reinforcing exclusion instead of supporting integration (Olsen, Martins, 2012).

Despite the growing emphasis on diversity, several important questions remain unresolved. How do managers translate diversity principles into everyday management practices? How successful are recruitment processes in selecting individuals who not only contribute diverse perspectives but also align with the organization's core values and integrate effectively into existing teams? Diversity, if pursued without a clear organizational purpose, may fail to generate the anticipated value. Thus, the debate has shifted from asking whether diversity is desirable to examining the conditions under which it can be managed successfully (O'Leary, Weathington, 2006). The role of organizational leadership remains crucial in fostering diversity (Ferdman, Deane, 2014; Dreachslin, 2007). According to Guillaume et al. (2017), organizations are better able to benefit from workforce diversity when leaders encourage employee participation, promote inclusion, provide an inspiring direction, and support employees through an individualized approach (Guillaume et al., 2017).

What is also important in the context of the presented research is the liberal approach to work and the market, in which individualism and originality are valued. This narrative can encourage the multitude of actions people take to stand out – in clothing, image, vocabulary, actions, but also in many other aspects of functioning. But what is meant to emphasize uniqueness, assert presence, and prevent us from being lumped together with the rest of the world can also lead to aggression, rejection, misunderstanding, lack of acceptance, and ultimately, complete exclusion. In this regard, the question of where tolerance for difference begins and ends remains relevant. What human beliefs cause difference to cease being a value and become a burden difficult to accept? Is it simply fear, aversion, values, individual experiences, or perhaps... also a desire to stand out?

Therefore, it is necessary to distinguish prejudices at the individual level (attitudes, behaviors) and the organizational level (recruitment and promotion practices) (Stephens and Rivera, 2020). In the opinion of respondents, it is precisely the lack of success, lack of work results, low competence, undervaluation, and low self-esteem that particularly trigger hateful behavior. It should be noted, however, that the complexity of the phenomenon, its multiple determinants, and its specific factors make it difficult to clearly identify the causes and underlying causes of hate speech, which could easily be corrected. There is no doubt, however, that the concept of diversity management is a delicate matter requiring significant managerial competencies. These include, above all, soft skills – emotional intelligence, empathy, managerial courage, communication skills, relationship-building, and an understanding of human needs and ambitions.

Milliken and Martins (1996) suggest that differences among members of organizational teams can influence key organizational outcomes, including productivity and staff turnover, because diversity affects the ways employees think, communicate, interact, and interpret workplace experiences (Milliken, Martins, 1996). The operational dynamics of businesses, irrespective of their industry, are strongly influenced by globalization and the increasing diversity of the workforce (Tamunomiebi, Onah, 2019).

Another important issue highlighted by the presented research is the work environment. The specific nature of the industry or sector itself is not as significant as the organizational climate – pressure for results, the "rat race," rivalry, and intense competition. An atmosphere that creates pressure, while on the one hand it can foster efficiency, on the other, must also find an outlet.

This is precisely the space where, according to respondents, pathological behaviors develop, and controlling and recognizing them can be a significant challenge. From the perspective of the respondents, preventive and remedial actions should focus on the quality of relationships, communication methods, and also specific attitudes – especially openness to others.

Overall, the findings indicate that effective hate prevention requires a systemic approach integrating organizational culture, leadership practices, and employees' psychosocial functioning. Interventions focused exclusively on eliminating individual incidents are unlikely to produce sustainable effects unless they are accompanied by efforts to strengthen trust, fairness, psychological safety, and open communication. From this perspective, hate should be viewed not only as an individual behavioral problem but also as an indicator of broader organizational dysfunctions requiring systemic managerial responses.

The findings presented in this study allow the development of an integrative interpretation of workplace hate. Organizational factors, such as culture, leadership style, performance pressure, and diversity management, shape employees' psychosocial experiences, including perceived injustice, insecurity, lack of support, and reduced psychological safety. These experiences interact with individual needs related to self-esteem, recognition, and security, creating conditions in which hate-related behaviors become more likely. Consequently, hate should be understood as the outcome of interactions between organizational context and individual psychological processes rather than as a consequence of isolated interpersonal conflicts.

10. RESEARCH LIMITATIONS AND FUTURE DIRECTIONS

The limitations of this study are typical of many qualitative studies. Primarily, it should be noted that the sample studied is not representative, therefore, the results cannot be generalized to the entire population. Nevertheless, the collected empirical material reveals the perspective of a difficult-to-reach managerial group and addresses a research topic characterized by high sensitivity, but also the associated difficulty in obtaining in-depth information. A significant weakness is undoubtedly the regional context of the analyses, limited solely to managers employed in Poland. To at least partially eliminate this bias, the study also included the perspective of managers employed in foreign subsidiaries located in Poland. However, reference to the broader geographical context and its specific characteristics is clearly lacking.

Given this perspective, it can be assumed that further research focusing on the Eastern European region would be highly desirable. To further define and understand the essence of the hate phenomenon itself, it would certainly be desirable to conduct research (quantitative and qualitative) encompassing a sample of employees across various industries and sectors, gender, and length of service, as well as longitudinal studies that would allow for the assessment of whether and how the perception of the phenomenon changes over time and to what extent it depends, for example, on the experiences or soft skills presented by respondents. Important limitations also include the selectivity of the

sample – study participants may have been particularly motivated or have had negative experiences, which could have led to an overestimation of the level and type of actions and behaviors indicated.

The study was exploratory in nature and aimed primarily at identifying the problem and defining the direction of further analysis, rather than providing definitive, statistically grounded conclusions. The possibility of narrative bias should also be emphasized. Respondents may have focused on the most salient experiences, which does not always reflect the full spectrum of the situation.

Declaration of AI: During the preparation of this work the author used Google Scholar, Scopus in order to search for relevant literature. The author used Google Translator in order to translate selected parts of the text into English, and Grammarly in order to proofread the English version. After using these tools/services, the author reviewed and edited the content as needed and take full responsibility for the content of the publication.

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Mouataz Biallah Benameur MEHDAOUI¹
Anes MESKINI²
Mohamed Zoheir GUETTAF³
Mohamed HEMKA⁴

EXAMINING THE ROLE OF SENIOR MANAGEMENT TEAM BEHAVIORAL INTEGRATION IN FOSTERING CREATIVE PERFORMANCE: THE MEDIATING EFFECT OF STRATEGIC FLEXIBILITY IN PUBLIC SECTOR INSTITUTIONS OF EL BAYADH PROVINCE, ALGERIA

This study aims to explore the impact of top management team behavioral integration on enhancing creative performance, while examining the mediating role of strategic flexibility in public administrative institutions in El Bayadh Province, Algeria. Its significance lies in addressing the research gap related to the scarcity of studies that have examined this relational model in the Algerian public sector. The study adopted a descriptive-analytical approach, and data were collected through a questionnaire administered to a stratified random sample of 213 employees representing 24 institutions, then analyzed using SPSS and AMOS. The results revealed a significant effect of behavioral integration dimensions on creative performance, with a significant mediating role of strategic flexibility. The study recommends adopting modern management practices that enhance behavioral integration, support institutional innovation, and develop strategic flexibility within public institutions.

Keywords: behavioral integration, creative performance, public administration, strategic flexibility, top management.

¹ Mouataz Biallah Benameur Mehdaoui, University Center Nour Bachir of El Bayadh, Algeria; e-mail: m.mehdaoui@cu-elbayadh.dz (corresponding author). ORCID: 0009-0003-7082-9957.

² Anes Meskini, University Ain Temouchent Belhadj Bouchaib, Algeria; e-mail: anes.meskini@univ-temouchent.edu.dz. ORCID: 0009-0004-1008-6108.

³ Mohamed Zoheir Guettaf, University Ahmed Zabana Relizane, Algeria; e-mail: mohamedzoheir.guettaf@univ-relizane.dz. ORCID: 0009-0006-2381-3903.

⁴ Mohamed Hemka, University Center Nour Bachir of El Bayadh, Algeria; e-mail: m.hemka@cu-elbayadh.dz. ORCID: 0009-0003-1389-7144.

1. INTRODUCTION

Recently, the world has witnessed rapid changes and developments that have imposed new challenges that have forced business organizations of all kinds to work in their midst and under their influence. The most prominent of these were the COVID-19 crisis, economic globalization, and the environmental uncertainty that organizations face in the business environment. These challenges have proven to the leaders of organizations that many theories and management orientations that have lasted for many years are no longer effective, and they have hoped that organizations will search for new options to achieve their goals and strengthen their capabilities to adapt to environmental variables in a way that achieves uniqueness and leadership in the market. Among these options are creativity, strategic flexibility and behavioral integration of the senior management team.

Both consider (Jabir, Rashid, 2013) that an organization with an advanced market position that allows it to maximize profits is difficult to achieve unless it can gain a competitive advantage over its competitors. All research related to strategic management indicates that creativity is an essential source for achieving sustainable competitive advantage. In order for creativity to be achieved, it is necessary to make good use of the available resources. This entails excellence in strategic flexibility by fostering an environment that encourages innovation (Mesaahel, Kafi, 2023).

Bhandari confirms that the traditional concepts of defining the characteristics of organizations that are active in the international arena are no longer sufficient to determine their chances of success and survival. Without the flexibility to respond to environmental changes, their success, if it is done, will be a coincidence (Bhandari, 2004). The strategic flexibility of the organization is related not only to their response to changes in the business environment, but also to their ability to model and shape their environment by leading change and using resources effectively (Hambrick, 1994).

Among the resources enjoyed by all organizations, we find the senior management team, where (Abdelkarim, Saleh, 2019) believes that the behaviorally integrated senior management team plays an important role in achieving the strategic flexibility that organizations need through the multiplicity of strategic alternatives that it prepares to deal with the environmental changes surrounding the organization, especially when this integration is through the exchange of information of the required quality and quantity or through participatory work and participation in decision-making taken by the team to deal with the strategic issues facing the work of the organization (Jingyuana, Yun, Ge, Nini, 2020).

Based on the above, and the limited studies in the field of behavioral integration of the senior management team, and the limited adoption of these topics in Algerian organizations, including the Algerian public administrative sector, and in order to reflect them in practice, this study came with the aim of demonstrating the impact of behavioral integration of the management team in enhancing creative performance through the mediating role of strategic flexibility in Algerian public institutions for the mandate of Al-Bayadh. Proceeding from this objective, the main problematic of the study was formulated as follows: Do the dimensions of behavioral integration of the senior management team have an impact on creative performance with the presence of strategic flexibility as an intermediary variable in Algerian public administrative institutions?

In line with the above, and to clarify the nature and trends of these relationships, the hypothetical scheme of the study was prepared to express the relationship between the

variables of the study, as this scheme revolves around a set of relationships between the variables as follows:

Independent variable: It is represented in the behavioral integration of the senior management team, which includes three dimensions: information exchange, cooperative behavior, and shared decision-making, and a measure was adopted (Hasan Yousef, Bashar, 2021); Yuzhen, Qiong, 2021). Jingyuan, Yun, Geb (2019) in identifying and measuring this variable.

Intermediate variable: Strategic flexibility, which includes three dimensions (human resources flexibility, organizational structure flexibility, resource flexibility), and the scale (Al-Mujahid and Al-Saida, 2021; Belkheldar, 2022; Al-Zamil, 2021) was adopted in identifying and measuring this variable.

Dependent variable: represented by creative performance, which includes two dimensions (originality, sensitivity to problems), and the scale (Jauk et al., 2014) was adopted in defining and measuring this variable.

The selection of the dimensions of the study variables is grounded in a solid theoretical framework, particularly within the Resource-Based View (RBV) and the Dynamic Capabilities Theory. The dimensions of the top management team's behavioral integration (information exchange, cooperative behavior, and joint decision-making) represent critical intangible resources embedded in managerial capital. According to RBV, competitive advantage stems from valuable, rare, and inimitable resources, such as the quality of leadership interaction and integration.

Furthermore, strategic flexibility, with its dimensions (human resource flexibility, organizational structure flexibility, and resource flexibility), aligns closely with the Dynamic Capabilities Theory, which emphasizes an organization's ability to reconfigure its resources and adapt to changing environments. These dimensions collectively reflect the organization's capacity to respond effectively and sustain competitiveness.

As for creative performance, the dimensions of originality and problem sensitivity represent key outcomes of effectively leveraging organizational resources and dynamic capabilities. Originality reflects the generation of novel and uncommon ideas, while problem sensitivity indicates the ability to identify challenges and opportunities, forming the foundation of effective creative processes

2. LITERATURE REVIEW

2.1. Behavioral Integration of Senior Management Team

Al-Jameel explained that the concept of the team appeared for the first time in the field of management when Henry Fayol identified a number of management principles, including the principle of working as a team and the spirit of the group, that is, encouraging differential work and integration between members and functions in the organization, so that the various functions of the organization work as a unified system (Al-Jameel, 2005).

As for the concept of the top management team (Top management team), it was mentioned for the first time by Bourgeois, who showed that the senior management team is a small group of members with diverse skills and complementary experiences, this is confirmed by (George, Jones, 2008) by saying that the senior management team is characterized by diversity because it consists of managers from different interests, and this diversity helps in integrating the team in terms of knowledge, experience and experience and contributes to raising the efficiency of the senior management team, and in this regard (Abraham, Carmeli, 2008) indicates that there are two main directions of studies that dealt

with the variables affecting the efficiency of the senior management team in achieving organizational success, namely:

- TMT senior management team composition.
- Senior management team processes TMT.

The research is related to the composition of the senior management team, as an extension of the theory of administrative levels developed by Hambrick & Masson, in which they stressed that the organization is a reflection of the characteristics of the senior management team, represented in the age of the team members, the scientific background of the team members, and the financial position of team members. For example, younger team members are more oriented to the application of risky policies, unlike older members who often tend to adopt less risky policies. As for the scientific background of the senior management team members, the higher the educational level of the team members, the more this contributes to raising the cognitive energies of the team members and increasing their opportunities to generate new ideas, which increases the ability to innovate and innovate within the organization (Jabir, Rashid, 2013)

As for the financial position of the members of the senior management team, it has an impact on their strategic alternatives in creativity and financial payment. The high level of ownership of shares in the organization leads to the achievement of harmony and compatibility between the objectives of the organization and those of the shareholders (Al-Abadi, 2014).

Recently, however, researchers have tended to focus on studies that dealt with the operations of the senior management team at the expense of studies that focused on the composition and characteristics of the senior management team, justifying that the latter has failed to find mechanisms through which these characteristics can be transformed into organizational outputs, and this is between (Lawrence) when he stressed that the failure of studies related to the characteristics of the team to link the demographic variables of the senior management team to organizational results is due to the fact that demographic variables represent individual concepts and hypotheses that have not been accurately and realistically tested and measured (Lawrence, 1997).

The operations of the senior management team include activities related to social interaction, conflict interpersonal, and behavioral integration that are the core of our current study.

The concept of behavioral integration of the senior management team (TMTBI) was first introduced by the researcher (Hambrick), where he defined it as a multi-dimensional structure that aims to achieve integration between the activities and processes of the senior management team (TMT) as separate elements of social interaction (Social-Integration), which refers to the perceived harmonious relations, team cohesion (cohesion Team), which reflects the level of attraction between members, and the quality of information exchange (Hambrick, Mason, 1984).

Lubatkin believes that behavioral integration is a measure of consistency between the team's task activities and social activities, as it includes one variable of a social nature (cooperative behavior) and two variables related to the activities performed by the team (information exchanged between team members) and (contribution to the decision-making process) (Lubatkin, Simsek, Ling, Veiga, 2006).

Mesaahel and Kafi described the behavioral integration of the senior management team as the level of integration of senior management team members in information exchange activities, contributing to decision-making activities and working in a collaborative manner

to raise the level of organizational outputs, which helps achieve the strategic objectives of the organization (Mesaahel, Kafi, 2023).

While Cappelareello looked at the concept of behavioral integration from the perspective of creating a state of compatibility between social activities and task processes, as it is the ability to benefit from all the salient aspects of the activities of the senior management team and direct them to create this state of compatibility (Krishnan, 2016).

Some researchers have indicated that behaviorally integrated teams are characterized by open and timely information exchange among team members, enabling them to acquire complementary knowledge and skills that support adaptation to changing conditions, particularly under conditions of uncertainty.

Abraham & Carmeli believes that behavioral integration as a construct seeks to achieve three basic elements that are interrelated with each other to improve the performance of senior management teams, namely the quality and quantity of information exchanged between team members, cooperative behavior, and participation in decision-making. These interrelated elements represent factors that attract the team, and achieve satisfaction for its members, which contributes to increasing the degree of psychological cohesion and emotional interdependence among team members (Abraham, Carmeli, 2008).

It is important to differentiate between behavioral integration that focuses on the behavioral characteristics of the senior management team, and “social integration” where Caldwell-and-Barnett defines social integration as “the degree to which an individual is psychologically connected to others in the group”, so social integration refers more to the emotional characteristics of the group while behavioral integration is more concerned with the intrinsic processes of the group. Social integration is expected to be similar to behavioral integration, but conceptually different (O’Reilly et al., 1989).

2.2. Importance of Behavioral Integration for Senior Management Team

Elenkov that the high level of behavioral integration among senior management team members enhances the opportunities for team innovation, as team innovation refers to the tendency of senior management team members to engage in new ideas and support creative processes within the team, which may lead to new goods, services or technological processes in the future (Elenkov et al., 2005).

According to Hambrick, behavioral integration has three basic dimensions: cooperative behavior, the quantity and quality of information exchanged, and participation in decision-making (Hambrick, Mason, 1984). All three of these dimensions are important in creating new ideas and actions. A high level of cooperation between team members enhances levels of personal trust and at the same time reduces conflicts within the team. This makes their collective actions more proactive and decisive. In addition, collaborative behavior within the team enables team members to share new ideas fluently, freely, and without criticism or restrictions, ultimately reducing their chances of resisting new changes. In addition, through the collaborative spirit, team members acquire new ways of doing things, develop new approaches to work, change their behaviors, and may eventually adopt innovative behaviors (Jahanshahi, Brem, 2017).

In the context of information sharing, De Dreu et al. expect to create new ideas among team members when there is a high tendency among them to systematically disseminate information. Because members of behaviorally integrated senior management teams frequently engage in face-to-face interactions, the quality of the information exchanged between them should be higher than in teams where members meet face-to-face less frequently. The greater the level of information shared among team members, the more

likely they are to offer a new set of ideas for solving the problems they face (De Dreu et al., 2011).

Jahanshahi & Brem argue that members of behaviorally integrated senior management teams tend to make decisions jointly. Since the likelihood of failure to create innovative ideas is high, creating new ideas within teams requires a supportive environment, where team members do not worry about criticism when presenting their ideas, and joint decision-making within teams stimulates the commitment of their members to the results of their decisions because they believe that these decisions are their own. In addition, joint decision-making generates a nurturing and protective environment for new ideas before they become viable (Jahanshahi, Brem, 2017).

In the same context, he sees (Raes, Bruch, De Jong, 2013) that the behavioral integration of the senior management team has an impact on the productivity of the organization through behavioral, cognitive and emotional mechanisms in two aspects: (Raes, Bruch, De Jong, 2013).

When the behavior of the members of the senior management team is more homogeneous, as is the case with the high level of behavioral integration, it affects emotions such as inspiration and enthusiasm of employees in a more positive way. In particular, stimulating cooperation between managers with low administrative levels and workers, and resulting in effective work teams, and open and clear communications about what needs to be done, unlike senior management teams that show a low level of behavioral integration, this low level will negatively affect the emotions and feelings of workers that result in anger and frustration, as a result of the need of the senior management team for integration and homogeneity (Al-Abadi, 2014).

When the level of behavioral integration of the senior management team is high, employees will generate a positive awareness about the way the members of the senior management team work together to guide the organization, which will reflect positively on the cognitive ability of employees to focus on their tasks (Al-Abadi, 2014).

2.3. Strategic flexibility and Behavioral Integration of Senior Management Team

Strategic flexibility is a central concept in strategic management, as it expresses the organization's ability to adapt quickly and proactively to environmental changes to ensure its continuity and superiority. Abbott, Banerji (2003) defined it as the ability of an organization to adapt its production and marketing activities to the right time, place and price, while Jansch noted that it meant rapid control of internal and external resources to keep pace with strategic changes. Asikhia (2010) sees it as redirecting resources to cope with changes and improve performance, while Santos (Bernardes, Hanna, 2009) expanded the concept to include multiple dimensions such as lightness, adaptability, hedging, and patch ability (Abdelkarim, Saleh, 2019) also emphasized the essential role of senior management in building strategic resilience as a means to maintain competitive advantage in a volatile environment.

It can be said that strategic flexibility is closely linked to the behavioral integration of the senior management team, as this integration is the main pillar that enables the organization to respond effectively to environmental changes and implement strategic decisions quickly and efficiently. When senior management team members have a high degree of understanding, positive interaction, knowledge sharing and mutual trust, flexibility can be transformed from an organizational concept into a realistic practice that enhances the organization's ability to adapt and anticipate. Behavioral integration is a key enabler of strategic resilience, transforming differences in experiences and opinions within

senior management into constructive intellectual diversity that fosters innovation and readiness to face the dynamic environment

H¹: There is an impact of the behavior integration of the senior management team on the strategic flexibility in the Algerian public administrative institutions.

2.4. Creative Performance and Behavioral Integration of Senior Management Team

Creative performance is defined by (Askar, 2016) as the result of the decisions of the decision-maker in collecting information and awareness of the problem, and his quest to solve it and evaluate and try solutions, where creativity is the emergence of original and unfamiliar solutions. Darwish (2014) also describes creative performance as the possibility of using authentic methods to synthesize ideas and connect them in unfamiliar ways, reflecting the mental potential in tackling problems in a creative way. (Gong et al. 2018) argue that creative performance is an essential source of innovation and competitive advantage, influenced by situational and interpersonal factors, and includes two key variables, 'originality and utility'. Gantumur and Stephan (2012), on the other hand, define creative performance as the annual growth of creative output and research output as a proportion of an organization's total productivity. Also, Neska and Savioty argue that creative performance is measured by the number of patents and the rate of quotations registered for them, while (Khey et al. ,2008) argue that creative performance is the organization's ability to perceive external knowledge and its compatibility with the organization's specificity and link it to the outputs of creativity.

Based on the above, it can be said that the behavioral integration of the senior management team is a pivotal factor in supporting and motivating creative performance within the organization. When team members interact in harmony and cooperation, they are better able to exchange innovative ideas, employ knowledge in unconventional ways, and make creative decisions that contribute to efficient problem-solving (Cai et al., 2020). This integration enhances the team's ability to evaluate and pilot solutions, which reflects positively on creative performance results and contributes to the effective achievement of organizational goals.

H²: There is an impact of the behavior integration of the senior management team on the creative performance in the Algerian public administrative institutions.

2.5. Strategic flexibility as a mediating factor between the behavioral integration of the senior management team and creative performance

Strategic flexibility is an effective mediating factor between the behavioral integration of the senior management team and creative performance. Behavioral integration enhances the team's ability to make flexible and rapid decisions, which positively impacts the organization's ability to innovate and respond to challenges (Abderrahman, Mimoune, 2023). This relationship shows that the interaction and cooperation of the members of the senior management team enables the organization to build an environment supportive of creativity, and increases the chances of achieving creative performance by continuously adapting to internal and external variables (Hameeda, Rasheed, 2020).

H³: The dimensions of behavioral integration of the senior management team have an impact on creative performance with the presence of strategic flexibility as an intermediate variable in Algerian public administrative institutions in the state of El Bayadh.

Previous empirical studies have shown considerable variation in interpreting the impact of top management team integration on organizational performance. Early studies, such as

Hambrick and Mason, focused on the demographic characteristics of the team (age, educational background, and financial status) as indirect determinants of organizational outcomes. However, this approach has been criticized for its limited explanatory power and its failure to provide clear mechanisms linking these characteristics to actual results.

In contrast, more recent studies, such as those by Lubatkin et al. and Abraham and Carmeli, have shifted their focus toward behavioral processes within the team, arguing that the quality of information exchange, cooperative behavior, and participation in decision-making are more powerful variables in explaining high performance. Other studies, such as Lua et al., have supported this perspective by highlighting the role of behavioral integration in enhancing adaptability to dynamic environments.

In this context, the researcher adopts the view that behaviorally integrated teams are those characterized by performing their tasks in a cooperative manner, engaging in effective interaction through participatory decision-making, and fostering open information exchange among members. Such characteristics enable these teams to adapt to environmental changes and improve the quality of their strategic decisions, ultimately contributing to the achievement of organizational strategic objectives.

Nevertheless, this approach is not without criticism, as some scholars argue that an excessive focus on processes may overlook the influence of the team's structural characteristics. This suggests the need for an integrative approach that combines demographic characteristics with behavioral processes to achieve a more comprehensive understanding of how organizational effectiveness is attained. Accordingly, the literature has yet to reach a definitive consensus; rather, it reflects a shift from a static, trait-based explanation to a dynamic perspective emphasizing interaction and behavior within the team.

3. METHODOLOGY

Overall, this study aims to highlight the public administrative sector, as a vital and pivotal sector compared to the rest of the other sectors. The study population consists of high-ranking employees belonging to Group A in the public administrative institutions of the White State. A stratified random sample was selected using the Richard Geiger equation to determine the appropriate minimum sample size, ensuring the best representation of the study population, according to the formula shown below.

$$n = \frac{\left(\frac{z}{d}\right)^2 \times (0,50)^2}{1 + \frac{1}{N} \left[\left(\frac{z}{d}\right)^2 \times (0,50)^2 - 1 \right]} \dots \dots \quad (01)$$

where:

N: Community size = (about 440 employees)

Z: The standard score corresponding to the significance level is 0.95 and equal to 1.9

D: error rate

Applying the above equation, the required sample size is:

$$n = \frac{\left(\frac{z}{d}\right)^2 \times (0,50)^2}{1 + \frac{1}{N} \left[\left(\frac{z}{d}\right)^2 \times (0,50)^2 - 1 \right]} \quad 205 \dots \dots \quad (02)$$

Given the required sample size according to the method used at the top, which is 205 employees – the researcher chose a stratified random sample consisting of employees in the Algerian public administrative institutions of the Wilaya of Bayadh, working in (24) public administrative institutions.

Whereas, the researcher distributed the questionnaire electronically by designing the questionnaire on the Google form website and communicating with the members of the selected sample through social media sites to fill it out electronically, 213 questionnaires were received with a recovery rate of 85.2%, and all of them were valid and usable, as they were designed in a way that ensures that they were filled out correctly before being sent electronically. The following table shows the distribution of the study sample:

Table 1. Distribution of the study sample

Name of the Institution		Number of Employees	Percentage %
Name of the Institution	LOCAL MANAGEMENT	8	3.8
	Municipality	8	3.8
	Public Treasury	8	3.8
	Nour Al-Bashir University Center	13	6.1
	State Property Directorate	6	2.8
	Directorate of Public Works	8	3.8
	Directorate of Programming and Budget Follow-up	8	3.8
	Environment Directorate	8	3.8
	Directorate of Trade and Export Promotion	7	3.3
	Directorate of Public Equipment	6	2.8
	Directorate of Education	13	6.1
	Directorate of Operation	7	3.3
	Directorate of Culture	9	4.2
	Directorate of Housing	11	5.2
	Directorate of Youth and Sports	6	2.8
	Directorate of Health and Population	9	4.2
	Directorate of Industry	12	5.6
	Tax directorate	13	6.1
	Directorate of Energy and Mines	13	6.1
	Directorate of Forestry	7	3.3
	Mujahideen District	8	3.8
	Directorate of Agricultural Interests	10	4.7
	Directorate of Water Resources	9	4.2
	Directorate of Training and Vocational Education	6	2.8
	Total	213	100%

Source: Prepared by the researchers.

Constructive validity (Construct Validity) is a measure that reflects the extent to which a study tool can measure the concept or theoretical construct it is supposed to measure. In other words, it is about the compatibility of the instrument with the theory related to the construction it aims to measure. The correlation coefficients between the total score of the questionnaire with the axes and its constituent dimensions are calculated through the method of structural validity. Table 1 shows the correlation coefficients at the level of the main axes and the total score of the questionnaire.

Table 2. Correlation coefficients at the level of the main axes and the total score of the questionnaire

Axe	Dimension	Pearson correlation coefficient	Probability value (sig)
Behavioral integration of the senior management team	Information exchange	0.733	0,000
	Collaborative Behavior	0.826	0,000
	Participatory decision making	0.674	0,000
Behavioral Integration of Senior Management Team		0.898	
Strategic Flexibility	Organizational Structure Flexibility	0.843	0,000
	HR Flexibility	0.854	0,000
	Flexibility of resources.	0.855	0,000
Strategic flexibility		0.924	
Measure creative performance	inherency	0.680	0,000
	Sensitivity to Problems	0.549	0,000
Measure creative performance		0.711	0,000

Source: Prepared by the researcher based on the outputs of the SPSSv26 program.

It is clear from Table 2 that the correlation coefficient of the first axis “behavioral integration of the senior management team” with the total score of the questionnaire was (0.898), while the correlation coefficient of the second axis “strategic flexibility” was (0.924), while the correlation coefficient of the third axis “creative performance” was (0.711).

At the level of the sub-dimensions of the first axis, the coefficients of their correlation with the axis came in the manner of (0.733) for the first dimension “exchange of information”, (0.826) for the second dimension “cooperative behavior”, and (0.674) for the third dimension “shared decision-making”, as all correlation coefficients (validity) are statistically significant at the level of 0.05, this indicates a high degree of validity of the sub-dimensions and the main axes of the data collected from the members of the exploratory sample, and therefore all the dimensions of the questionnaire are considered honest and measure what they were developed to measure.

3.1. Discriminatory honesty (peripheral comparison)

The validity of the scale was calculated through discriminatory validity, by ordering the answers of the sample examined in the five-point Likart scale in descending order, and the significance of the differences between the mean scores of the sample with high answers on the scale was calculated to be higher than (33%), and the mean scores of the sample with low answers on the same scale were calculated to be less than (33%).

Table 3. Comparison results: Discriminatory honesty (terminal comparison)

	Collection	Ser	Arithmetic Mean	Standard Deviation	T value	Level of significance
Overall Answers	Minimum Values	12	3.511	0.375	19.134	0,000
	Upper Values	12	4.395	0.100		

Source: Prepared by the researcher based on the outputs of the SPSS_{v26} program

It is clear from Table 3 that the total answers are statistically significant at a significance level of 0.05, which indicates that the scale and its dimensions have strong discriminatory validity.

3.2. Questionnaire Stability

Questionnaire stability refers to how stable and reliable the results obtained when the same questionnaire is reused in similar circumstances. In other words, if the questionnaire is applied to the same group of individuals at two different times, the results should be similar if the questionnaire is static.

The researcher verified the stability of the study's questionnaire through Cronbach 'alpha coefficient, and the results were as shown in Table 4.

Table 4. Cronbach's alpha Coefficient

Axle	Dimension	Paragraphs No.	Cronbach's Alpha Coefficient
Behavioral integration of the senior management team	Information exchange	4	0.633
	Collaborative Behavior	4	0.792
	Participatory decision making	4	0.790
Behavioral Integration of Senior Management Team		12	0.853
Strategic flexibility	Organizational Structure Flexibility	4	0.726
	HR Flexibility	4	0.824
	Flexibility of resources	4	0.836
Strategic flexibility		12	0.918
Measure creative performance	inherency	4	0.610
	Sensitivity to Problems	4	0.697
Measure creative performance		8	0.748
Total Questionnaire Themes		32	0.924

Source: Prepared by the researcher based on the outputs of the SPSS_{v26} program.

Table 4 shows that the value of the Cronbach alpha coefficient is high for the total questionnaire, where the value of the Cronbach alpha is (0.924). As for the axes of the study, the value of the Cronbach alpha coefficient for the behavioral integration axis of the senior management team was (0.853), while the value of the Cronbach alpha coefficient for the strategic flexibility axis was (0.918). The value of the Cronbach alpha for the creative performance axis was (0.748), so the questionnaire is in its final form as it is in distributable.

3.3. Independence test

The Pearson correlation coefficient matrix was calculated to determine the relationship between the study variables and to determine whether the study model data are suitable for analysis, with the aim of discovering whether there is a problem of linear correlation between them. Table 5 shows the results of the correlation coefficients between the study variables.

Table 5. Matrix of correlation coefficients between the study variables

Variables	Information exchange	Collaborative Behavior	Participatory decision making	Strategic flexibility	creative performance
Information exchange	1				
Collaborative Behavior	0.749	1			
Participatory decision making	0.573	0.438	1		
Strategic flexibility	0.640	0.748	0.435	1	
Creative performance	0.411	0.391	0.580	0.514	1

Source: Prepared by the researcher based on the outputs of SPSS v26 program

From the results mentioned in Table 5, it is clear that most of the correlations between the studied dimensions are statistically significant at the significance level (0.05), and the correlation values between the dimensions of the independent variable are less than (0.80), and therefore the dimensions of the independent variable are not fully correlated with the dimensions of other variables.

4. DATA ANALYSIS AND HYPOTHESIS TESTING STUDY

Table 6 shows that (3.8%) of the study sample are 18-29 years old, while (31%) of the study sample are 30-39 years old, while (48.8%) of the study sample are between 40-49 years old, while (16.4%) of the study sample are 50 years old and above.

Table 6. Distribution of sample members by (age group)

Age group	FREQUENCY	Percentage %
18-29 years old	8	3.8
30-39 years old	66	31
40-49 years	104	48.8
50 years and above	35	16.4
Total Amount	213	100

Source: Prepared by the researcher based on the outputs of the SPSSv26 program.

The researcher explains these results that most of the employees are young people under the age of 49, and that the small number of those under the age of 30 is due to the lack of employment in recent years due to the economic conditions experienced by Algeria and the application of the policy of rationalization of expenditures, as well as the nature of senior positions that need great experience.

4.1. Analyzing of results

4.1.1. Results of the statistical analysis of the behavioral integration axis of the senior management team (independent variable)

The results of Table 7 show that the total arithmetic mean of the axis was about 4.07 and the relative weight was about 81.52, which reflects a high level of behavioral integration among team members. It turns out that after “participation in decision-making” came first with an average of about 4.19 and a relative weight of about 83.89, which indicates that the involvement of members in decisions is the most prominent feature in the team's behavior. It is followed by the “exchange of information” in second place with an average of about 4.14 and a relative weight of about 82.95, indicating a good degree of information flow and sharing among senior management members.

Table 7. Results of the statistical analysis of the behavioral integration axis of the senior management team (independent variable)

N°	DIMENSION	Arithmetic Mean	Standard deviation	Relative weight	Value T	Ranking	Approval Level
1	Dimension 1: Information Sharing	4.14	0.47	82.95	35.45	2	High
2	The second dimension: cooperative behavior	3.88	0.62	77.63	20.70	3	High
3	Dimension 3: Participatory Decision Making	4.19	0.59	83.89	29.23	1	High
Total score		4.07	0.47	81.52	33.41		High

Source: Prepared by the researcher based on the outputs of the SPSSv26 program.

After the “cooperative behavior”, it came in third and last with an average of about 3.88 and a relative weight of about 77.63, and although it is within a “high” level, it represents the relatively weakest dimensions, which highlights the need for the team to further develop cooperation and teamwork practices to raise this dimension to a level parallel to the two dimensions of information exchange and participation in the decision.

4.1.2. Results of the statistical analysis of the strategic resilience axis (intermediate variable)

The data in Table 8 shows that the level of strategic flexibility as an intermediate variable was high in all dimensions. The arithmetic mean of the total score was 3.83, reflecting the availability of good organizational flexibility in the organization from the point of view of the sample members.

Table 8. Results of the statistical analysis of the strategic resilience axis (intermediate variable)

N°	DIMENSION	Arithmet ic Mean	Standard deviation	Relative weight	Value T	Ranking	Approval Level
1	Dimension 1: Organizational Structure Flexibility	3.87	0.63	77.51	19.99	1	High
2	Second Dimension: Resilience of Human Resources	3.80	0.71	76.05	16.39	3	High
3	Dimension 3: Resource Resilience	3.81	0.65	76.29	18.20	2	High
Total score		3.83	0.61	76.61			High

Source: Prepared by the researcher based on the outputs of the SPSSV26 program.

The results show that after the “organizational structure flexibility”, it ranked first with an average of 3.87, a relative weight of 77.51% and a value of 19.99, indicating that organizational structures and procedures are characterized by a high degree of flexibility. The “resource flexibility” came second with an average of 3.81, a relative weight of 76.29% and a value of 18.20, which indicates the ability of the organization to redirect its financial, material and human resources in line with the requirements of the work. After “human resources flexibility”, it ranked third with an average of 3.80, a relative weight of 76.05% and a value of 16.39, which means that recruitment, training and incentives policies are flexible but represent the relatively weakest dimensions and need further strengthening.

The T-value of the overall score (19.68) and its statistical significance at a level below 0.001 indicate that this high level of resilience is not incidental, but represents a stable general trend among the respondents' views on the resilience of the organization.

4.1.3. Results of the statistical analysis of the creative performance axis (dependent variable)

The results of Table (09) indicate that the level of creative performance among the sample members was high in its two dimensions of originality and sensitivity to problems, as the arithmetic mean of the originality dimension was 4.30 with a standard deviation of 0.41 and a relative weight of 86.12%, reflecting a high degree of availability of this dimension and making it in the first rank with a value of T of 45.82. After sensitivity to problems, he obtained an arithmetic mean of 4.16, a standard deviation of 0.48, and a relative weight of 83.26%, and came in second place with a value of T of 35.34, which also indicates a high level, albeit less than after originality. The overall score of the axis shows that the overall average creative performance was 4.23 with a standard deviation of 0.38 and a relative weight of 84.69%, which confirms that the respondents enjoy a high level of creative performance in general, with a relative need to further develop the aspect of sensitivity to problems compared to the dimension of originality.

Table 9. Results of the statistical analysis of the creative performance axis (dependent variable)

N°	DIMENSION	Arithmetic Mean	Standard deviation	Relative weight	Value T	Ranking	Approval Level
1	Dimension 1: Authenticity	4.30	0.41	86.12	45.82	1	High
2	Dimension 2: Sensitivity to Problems	4.16	0.48	83.26	35.34	2	High
Total score		4.23	0.38	84.69	46.90		High

Source: Prepared by the researcher based on the outputs of the SPSS_{V26} program.

4.2. Hypothesis Testing

4.2.1. The first hypothesis

This hypothesis states that: There is an impact of the behavioral integration of the senior management team, in its dimensions (information exchange, cooperative behavior, shared decision-making) on strategic flexibility in its combined dimensions in the Algerian public administrative institutions. This hypothesis can be formulated as follows:

H⁰: There is no statistically significant effect at the level of significance (0.05 = Sig) of the behavioral integration of the senior management team in its dimensions (information exchange, cooperative behavior, shared decision-making) in the strategic flexibility in its dimensions combined in the Algerian public administrative institutions of the White State.

H¹: There is a statistically significant effect at the level of significance (0.05 = Sig) of the behavioral integration of the senior management team in its dimensions (information exchange, cooperative behavior, shared decision-making) in the strategic flexibility in its dimensions combined in the Algerian public administrative institutions of the White State.

In order to test this hypothesis, multiple linear regression will be relied upon according to the following decision rule:

If the calculated significance level (Sig) is greater than the approved significance level of (0.05), we accept the zero hypothesis H⁰, but if the calculated significance level (Sig) is less than the approved significance level of (0.05), we reject the zero hypothesis H⁰ and accept the alternative hypothesis H¹.

Table 10. Multidimensional Regression Analysis of the Behavioral Integration Impact of the Senior Management Team on Strategic Resilience

Dependent variable	The independent Variable	B Regression coefficient		Testing the T	Sig Level of significance	R Correlation coefficient (Maths.)	R ² Coefficient of Determination	F Calculated
Strategic flexibility	Behavioral Integration of Senior Management Team	Dimension 2: Cooperative Behavior	0.604	9.00	0,000	0.761	0.580	96.03
		Dimensions excluded from the model for statistical non-significance						
		Dimension 1: Information Sharing	0.170	1.75	0.081			
		Dimension 3: Participatory Decision Making	0.096	1.69	0.092			

Source: Prepared by the researcher based on the outputs of the SPSSv26 program.

Impact equation: strategic flexibility = 0.380 + 0.604 (cooperative behavior)

The multiple regression model shown in Table 10 shows that strategic flexibility, which represents the dependent variable, is fundamentally and statistically significant affected by the cooperative behavior dimension.

The dimensions (information exchange, shared decision-making) were excluded for lack of statistical significance, since when the combined effect of the behavioral integration dimensions of the senior management team on strategic flexibility was studied, (information exchange, shared decision-making) did not achieve statistical significance due to impact priorities, which favored the collaborative behavior dimension.

The adjusted coefficient of determination was (0.580), which means that 58% of the change in strategic flexibility is due to the influence of cooperative behavior and the rest is due to other factors that affect strategic flexibility.

Result: We reject the null hypothesis H^0 and accept the alternative hypothesis H^1 , which states that there is an effect of the behavioral integration of the senior management team in its dimensions (information exchange, cooperative behavior, participation in decision-making) on strategic flexibility in its combined dimensions in the Algerian public administrative institutions of El Bayadh Province

4.2.2. The second hypothesis

There is an impact of the behavioral integration of the senior management team in its dimensions (information exchange, cooperative behavior, shared decision-making) in the creative performance in its dimensions combined in the Algerian public administrative institutions of the White State. This hypothesis can be formulated as follows:

H^0 : There is no statistically significant effect at the level of significance ($0.05 = \text{Sig}$) of the behavioral integration of the senior management team in its dimensions (information exchange, cooperative behavior, shared decision-making) in the creative performance in its dimensions combined in the Algerian public administrative institutions of the White State

H^1 : There is a statistically significant effect at the level of significance ($0.05 = \text{Sig}$) of the behavioral integration of the senior management team in its dimensions (information exchange, cooperative behavior, shared decision-making) in the creative performance in its dimensions combined in the Algerian public administrative institutions of the White State.

In order to test this hypothesis, multiple linear regression will be relied upon according to the following decision rule:

If the calculated significance level (Sig) is greater than the approved significance level of (0.05), we accept the zero hypothesis H^0 , but if the calculated significance level (Sig) is less than the approved significance level of (0.05), we reject the zero hypothesis H^0 and accept the alternative hypothesis H^1 .

Impact Equation: Creative Performance = $2.47 + 0.11$ (Collaborative Behavior) + 0.32 (Co-Decision Making)

The multiple regression model shown in Table 11 shows that creative performance that represents the dependent variable is fundamentally and statistically significant affected by the cooperative behavior dimension and the participatory decision-making dimension.

The dimension (exchange of information) was excluded because of the lack of statistical significance, as when the impact of the dimensions of behavioral integration of the senior management team was studied collectively on creative performance, the (exchange of information) did not achieve statistical significance because of the priorities of impact, which were in favor of the collaborative behavior dimension and the shared decision-making dimension.

The adjusted determination coefficient was (0.590) This means that 59% of the change in creative performance is attributed to the impact of collaborative behavior and shared decision-making, and the rest is due to other factors that affect creative performance.

The result: We reject the null hypothesis H^0 and accept the alternative hypothesis H^1 , which states that there is a statistically significant effect, at a significance level of 0.05 , of the behavioral integration of the senior management team, across its dimensions (information exchange, cooperative behavior, and shared decision-making), on creative performance across its combined dimensions in Algerian public administrative institutions in the province of El Bayadh.

Table 11. Multiple Regression Analysis of the Behavioral Integration Impact of the Senior Management Team in Creative Performance

Dependent variable	The independent variable	β Regression coefficient		Testing the T	Sig Level of significance	R Correlation coefficient (Maths.)	R ² Coefficient of Determination	F Calculated
Performance innovation	Behavioral Integration of Senior Management Team	The second dimension: cooperative behavior	0.11	2.13	0.00	0.59	0.35	39.07
		Dimension 3: Participatory Decision Making	0.32	7.54	0.03			
		Dimensions excluded from the model for statistical non-significance						
		Dimension 1: Information Sharing	-0.1	-0.15	0.87			

Source: Prepared by the researcher based on the outputs of the SPSSV26 program.

4.2.3. The third hypothesis

This hypothesis states that: There is an effect of the behavioral integration of the senior management team in creative performance with the presence of strategic flexibility as an intermediate variable in the Algerian public administrative institutions of the White State. This hypothesis can be formulated as follows:

H⁰: There is no statistically significant effect at the level of significance (0.05= Sig) of the behavioral integration of the senior management team in creative performance with the presence of strategic flexibility as an intermediate variable in Algerian public administrative institutions.

H¹: There is a statistically significant effect at the level of significance (0.05 = Sig) of the behavioral integration of the senior management team in creative performance with the presence of strategic flexibility as an intermediate variable in Algerian public administrative institutions.

In order to test this hypothesis, the Amos analysis program was used based on the path analysis test and the suitability test of the specified model. Table 12 shows the results of this test.

It is clear from Table 12 that the model is a very good match, as the values of the NFI index reached (0.999), which is a very good value, and the value of the Comparative Relevance Index (CFI) reached (1), which is a very good value, and the Relevance Index (RFI) was also very good (0.991), and the Confidence Limits Index (RMSEA) recorded a good value of (0.00). The results also showed in Figure (2.3) that the value of (Ch2) "Chi standard square" was (0.917), which is a function at the level of (0.05≥a), and the value of (GFI) was (0.999), based on the previous indicators, we conclude that the suitability of the model for the data is very good.

Table 12. Acceptance indicators and conformity to the quality of the form

	Very Good	Good.	Pass	Rejected
χ^2/df	<1	]1 :2]	]2 5]	>5
NFI	>0.95	]0.95 :0.9]	]0.9 :0.8]	<0.8
CFI	>0.95	]0.95 :0.9]	]0.9 :0.8]	<0.8
RFI	The closer to the value of 1			
TII	>0.95	]0.95 :0.9]	]0.9 :0.8]	<0.8
RMSEA	<0.05	]0.08 :0.05]	]0.10 :0.08]	>0.10

Source: (Sarmento, Costa, 2019).

Table 13. Results of testing the suitability of the selected model

	Conformity Indicators for Model Quality					
	χ^2/df	NFI	CFI	RFI	TII	RMSEA
Model Indicators	0.917	0.999	1	0.991	1.00	0.00
Decision	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good

Source: Prepared by the researcher based on (Sarmento, Costa, 2019).

After confirming the suitability of the proposed paths model to test the fourth main hypothesis, the paths were tested for the study variables, and the results came as shown in the table.

Table 14. The results of the pathway analysis of the direct and indirect impact of the behavioral integration of the senior management team on creative performance mediated by strategic flexibility

Direct route -----		Value Impact	
Information exchange	Measure creative performance	-0.256	
Collaborative Behavior	Measure creative performance	-0.349	
Participatory decision making	Measure creative performance	0.017	
Indirect Path -----			Value Impact
Information exchange	Strategic flexibility	Measure creative performance	0.245
Collaborative Behavior	Strategic flexibility	Measure creative performance	0.459
Participatory decision making	Strategic flexibility	Measure creative performance	0.310

Source: Prepared by the researcher based on the outputs of AMOS v24 program.

Table 14 shows that the direct impact values between the dimensions of the behavioral integration of the senior management team and the creative performance were very low, ranging between (-0.349) and (0.017).

Table 14 also shows that the impact values between the dimensions of the behavioral integration of the senior management team and the creative performance in the presence of an indirect influencer (the intermediate variable) strategic flexibility were medium, and when comparing the direct impact values between the behavioral integration of the senior management team and the indirect impact values between them, it is noted that the impact values in the presence of strategic flexibility as an intermediary factor have all increased, and this indicates that strategic flexibility as an intermediate variable has a positive impact on the direct impact between the dimensions of the behavioral integration of the senior management team, as this variable (the intermediary) clearly raised the impact values and the mediation was partial

The result: We reject the null hypothesis H^0 and accept the alternative hypothesis H^1 , which states that there is a statistically significant effect at the level of significance ($0.005 = \text{Sig}$) of the behavioral integration of the senior management team in creative performance with the presence of strategic flexibility as an intermediate variable in the Algerian public administrative institutions of the White State.

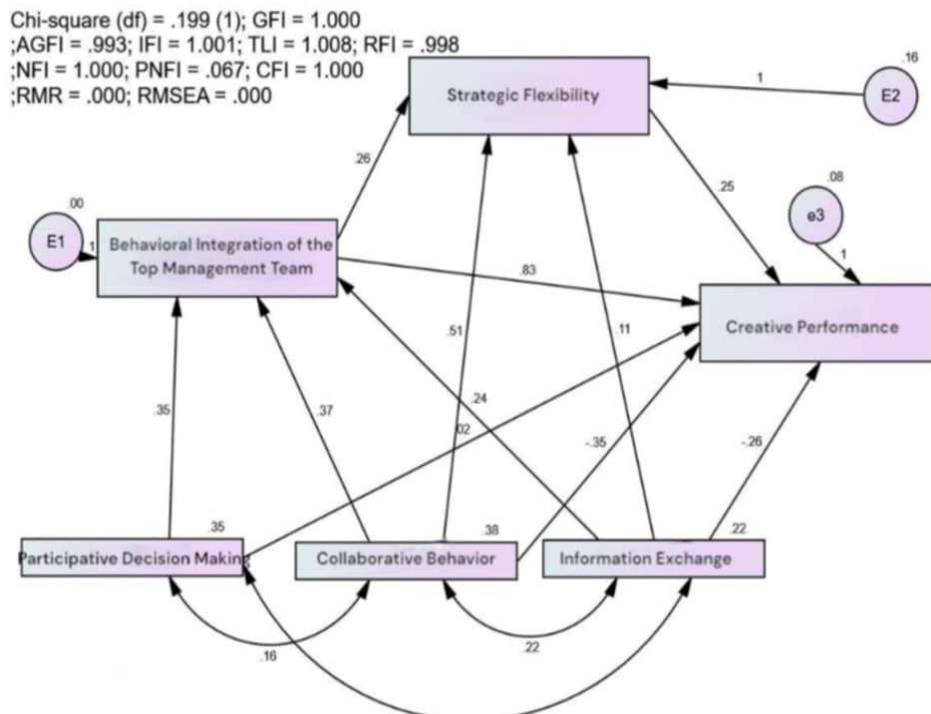


Figure 1. The detailed model of the study

Source: Prepared by the researcher based on the outputs of the AMOS v24 program.

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the study showed that there is an impact of the behavioral integration of the senior management team in the creative performance with the presence of strategic flexibility as an intermediate variable in the Algerian public administrative institutions of the White State. These findings support previous research that emphasized the importance of behavioral integration in enhancing creative performance, as noted by researchers (Abdelkarim, Saleh, 2019) who found that integrated teams have a higher capacity for innovation. In addition, the results of the (Abderrahman, Mimoune, 2023) study indicate that strategic flexibility plays a pivotal role in enhancing creative performance, explaining that institutions that are able to adapt to environmental changes have greater opportunities for innovation.

The study recommends that Algerian public administrative institutions adopt a modern management philosophy based on consolidating integrated organizational behavior, encouraging teamwork, and expanding participation in decision-making in a way that strengthens employees' commitment and enhances performance effectiveness. It also emphasizes the need to develop strategic flexibility by investing in human resource qualification, empowering employees, simplifying administrative procedures, and adopting modern technological solutions to improve performance efficiency. In the same vein, the study highlights the importance of establishing a culture of innovation within the work environment through fair incentive and evaluation systems, providing the necessary resources to support creative initiatives, and making use of artificial intelligence tools to improve the quality of decisions. It further calls for accelerating digital transformation so that it becomes a comprehensive institutional culture, contributing to reducing bureaucracy, strengthening decentralization in decision-making, and adopting flexible employment policies that give young university graduates equal opportunities to participate in renewing and developing the public sector.

Based on this, the practical significance of these findings lies in offering public institution managers a set of applied directions, the most important of which are: redesigning internal management practices on the basis of participation and delegation, reviewing administrative procedures to reduce complexity and duplication, investing in continuous training for staff in digital and administrative skills, and integrating artificial intelligence tools into planning and decision-making support. These findings also require administrative leaders to build an organizational climate that encourages initiative and innovation, activate objective systems of evaluation and motivation, and open the way for young talents to contribute to the modernization of the public service and the acceleration of digital transformation

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for the content, interpretations, and conclusions of this manuscript rests solely with the author.

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Boulenouar Ilias Zakaria MENNAD¹
Anes MESKINI²
Amina BENHADDOU³
Zahra DERRICHE⁴

POVERTY, HUMAN DEVELOPMENT AND FINANCIAL DEVELOPMENT IN ARAB AFRICAN COUNTRIES: IS THERE A NEXUS?

This study examines the relationship between poverty, human development, and financial development in eight Arab African countries over the period 1991-2021, with a focus on the reverse nexus whereby social development drives financial sector expansion. Using a Panel ARDL model, the analysis captures both short-run and long-run dynamics, complemented by the Granger causality test to assess causal directions. The results reveal a significant long-run relationship among the variables. Poverty exerts a negative and significant effect on financial development, while human development contributes positively to financial deepening and inclusion. In the short run, no significant effects are observed, reflecting the delayed impact of social factors. Causality findings indicate a bidirectional relationship between poverty and financial development, and a unidirectional effect from human development to financial development. These results underscore the importance of sustained investments in human capital and poverty reduction policies to promote inclusive financial development in Arab African countries.

Keywords: poverty, human development, financial development, Arab African countries, panel ARDL, Dumitrescu-Hurlin causality.

1. INTRODUCTION

Financial development has long been recognized as a fundamental pillar of economic growth, macroeconomic stability, and long-term prosperity (Levine, 2004). Traditionally,

¹ Boulenouar Ilias Zakaria Mennad, University of Ain Temouchent, Algeria; e-mail: ilias.mennad@univ-temouchent.edu.dz (corresponding author). ORCID: 0000-0001-5521-7950.

² Anes Meskini, University of Ain Temouchent, Algeria; e-mail: anes.meskini@univ-temouchent.edu.dz. ORCID: 0009-0004-1008-6108.

³ Amina Benhaddou, University of Ain Temouchent, Algeria; e-mail: amina.benhaddou@univ-temouchent.edu.dz. ORCID: 0009-0003-7841-5986.

⁴ Zahra Derriche, University of Ain Temouchent, Algeria; e-mail: zahra.derriche@univ-temouchent.edu.dz. ORCID: 0000-0002-2928-5471.

the literature has focused on the role of financial systems in promoting economic and social outcomes, including poverty reduction and improvements in human development (Beck, Demirgüç-Kunt, Levine, 2007). In this conventional framework, financial development is treated as a primary driver of inclusive growth, facilitating capital allocation, enhancing access to credit, and supporting productive investment.

However, this predominantly unidirectional perspective has increasingly been challenged in recent years. Emerging research suggests that the relationship between financial development and social indicators is more complex and potentially bidirectional. In particular, improvements in human development and reductions in poverty may themselves create enabling conditions for the expansion, deepening, and efficiency of financial systems (Gnangnon, 2021; Tekin, 2021). This “reverse perspective” posits that social progress is not merely an outcome of financial development but can also act as a fundamental driver of financial sector evolution.

From a theoretical standpoint, several interrelated transmission channels can explain this reverse relationship. First, improvements in human development, particularly in education and health, enhance individuals’ cognitive abilities, financial literacy, and productivity, thereby increasing both the demand for and effective utilization of formal financial services. Second, poverty reduction strengthens households’ income stability and savings capacity, reducing credit risk and improving access to financial markets. Third, higher levels of human development contribute to stronger institutional quality, greater trust in financial systems, and lower information asymmetries, all of which are essential for financial deepening and inclusion (Honohan, King, 2009; Honohan, King, 2012). Collectively, these mechanisms suggest that social development can serve as a foundational precondition for sustainable financial sector development, particularly in structurally constrained economies.

This issue is particularly relevant in the context of Arab African countries, which exhibit significant heterogeneity in terms of economic structures, institutional quality, and social conditions. Despite ongoing financial reforms and modernization efforts, many countries in the region continue to face persistent challenges, including high poverty rates, limited financial inclusion, and disparities in education and healthcare (Abosedra, Shahbaz, Nawaz, 2015; UNDP, 2024). These structural challenges raise an important question: can improvements in social indicators serve as a prerequisite for effective financial development in such contexts?

Although a growing body of empirical literature has examined the finance – poverty and finance human development nexus, most studies continue to adopt a conventional analytical direction, focusing primarily on the impact of financial development on social outcomes (Perez-Moreno, 2011; Rewilak, 2017; Zahonogo, 2017). In contrast, relatively few studies have explored the reverse relationship, and even fewer have done so within an integrated framework that simultaneously considers poverty and human development as joint determinants of financial development (Gnangnon, 2021; Tekin, 2021). Moreover, empirical evidence remains particularly limited for Arab African countries, especially when using panel econometric approaches capable of distinguishing between short-run dynamics and long-run equilibrium relationships.

In light of these gaps, this study investigates the relationship between poverty, human development, and financial development in eight Arab African countries over the period 1991-2021. Departing from the dominant approach in the literature, the analysis adopts a reverse perspective by examining whether improvements in human development and reductions in poverty contribute to financial sector expansion. Methodologically, the study

employs the Panel Autoregressive Distributed Lag (ARDL) model, which allows for heterogeneous short-run adjustments while capturing long-run equilibrium relationships across countries.

This study contributes to the literature in three main ways. First, it advances the theoretical understanding of the finance–development nexus by explicitly modeling the reverse relationship and identifying the key transmission mechanisms linking social development to financial sector performance. Second, it provides new empirical evidence from a relatively underexplored regional context, where structural and institutional constraints may significantly shape these dynamics. Third, by employing a Panel ARDL framework, the study offers a nuanced analysis that distinguishes between short-term adjustments and long-term relationships, thereby providing a more comprehensive understanding of the interaction between poverty, human development, and financial development.

2. LITERATURE REVIEW

This section reviews the existing literature on the finance-poverty nexus through five key dimensions: First, it examines studies identifying a positive impact of finance, followed by those exploring nonlinear relationships and threshold effects. It then discusses empirical evidence utilizing the PMG-ARDL methodology, as well as research on reverse causality and the mediating role of human development. Finally, the section highlights the research gap and novelty that this study aims to address.

2.1. Literature on the positive impact of finance on poverty

Empirical findings regarding the impact of financial development on poverty remain divergent. One school of thought argues that financial development is an effective tool for poverty alleviation. For instance, Rewilak (2017) asserts that financial depth significantly reduces poverty levels. Similarly, Bayar (2017, 2023) demonstrates, through studies on Turkey and emerging markets, that enhanced access to finance mitigates income inequality. This positive role is further supported by Mbodj & Laye (2025) and Chemli (2014) in the context of developing countries and the MENA region, respectively. Conversely, De Haan et al. (2022) caution that financial progress may widen the poverty gap by exacerbating inequality. This is corroborated by Dhrifi (2015) and Bolarinwa et al. (2021), who suggest that weak financial inclusion in Africa may link financial efficiency with increased poverty. Furthermore, Fowowe & Abidoye (2013) conclude that African financial systems have generally been ineffective in reducing poverty.

2.2. Literature on nonlinearity and threshold effects

Other strands of literature suggest that the finance-poverty nexus is nonlinear. Zahonogo (2017) and Bolarinwa et al. (2021) identified a “threshold effect”, contending that financial development only becomes beneficial after surpassing a critical level of institutional maturity. Kiendrebeogo & Minea (2016) reinforce this perspective, emphasizing that financial instability can create potential adverse relationships with poverty rates.

2.3. Literature using PMG-ARDL methodology

Korankye et al. (2021) investigated the links between financial development, economic growth, and poverty across 14 African countries (1985-2017). Utilizing a dynamic Granger causality test and the Pooled Mean Group (PMG) estimator, they established a long-run

bidirectional relationship, with short-run stability maintained through error correction terms. Similarly, Soh et al. (2025) applied Panel ARDL and Panel Cointegration tests to ASEAN countries, concluding that financial development reduces income inequality at the aggregate level, despite short-run heterogeneity across countries like Indonesia, the Philippines, and Singapore. These methodological findings are further strengthened by Majid et al. (2019) in Indonesia, who found long-run integration and short-run bidirectional causality between poverty and finance. Sehwat & Giri (2014) confirmed a long-run relationship in India using a similar approach. In contrast, Afolabi et al. (2023) observed weak long-term effects of financial indicators on human development in Nigeria, recommending strengthened financial intermediation. Finally, Bolarinwa et al. (2021) employed these models to reaffirm the nonlinear and dynamic nature of the relationship through the identification of threshold effects.

2.4. Literature on reverse causality and the mediating role of human development

A distinct perspective is offered by studies such as Gnanon (2021), which demonstrates that high poverty levels can actually hinder financial development, suggesting a reverse relationship. Tekin (2021) examined the correlation between human growth (specifically health) and financial development, finding evidence of bidirectional causality. Furthermore, Kumar & Batra (2023) concluded that human development is a more potent driver of economic growth than financial development itself. In China, Zameer et al. (2020) emphasized that fintech innovation is the key to enhancing the effectiveness of anti-poverty strategies.

2.5. Research Gap and Novelty

The necessity of the present study arises from fundamental gaps in the existing economic literature. Despite the extensive research on the finance-poverty nexus, most studies have focused unilaterally on the impact of finance as an independent variable, largely neglecting the “reverse perspective”. This perspective posits that success in poverty reduction and the advancement of human development indicators create the favorable and stable environment required for financial sector expansion. This gap is particularly evident when considering the transmission channels that link the social structure to the financial framework; academic literature lacks models that integrate “human development” as a mediating and explanatory variable rather than merely a control variable.

Moreover, there is a clear methodological and spatial gap. Studies employing advanced econometric techniques, such as Panel ARDL and PMG, have predominantly focused on Southeast Asian or Sub-Saharan African economies. Consequently, Arab African countries (with their unique structural and institutional characteristics) have remained overlooked by this type of in-depth analysis that distinguishes between short- and long-run effects.

Thus, the novelty of this study lies in its attempt to bridge these gaps simultaneously by providing an analytical framework that tests reverse causality within a distinct regional context, while elucidating the mediating role of human development. This offers a comprehensive understanding that transcends traditional frameworks and contributes to more realistic and applicable policy recommendations for the study region.

3. METHODOLOGY

This study examines the relationship between poverty, human development, and financial development in a panel of eight Arab African countries (Algeria, Comoros,

Djibouti, Egypt, Mauritania, Morocco, Sudan, and Tunisia) over the period 1991-2021. The choice of this period is primarily driven by data availability, ensuring a balanced panel dataset with consistent observations across countries. The year 2021 represents the most recent period for which comprehensive data are available from international sources such as the International Monetary Fund (IMF).

From a methodological perspective, this study adopts the Panel Autoregressive Distributed Lag (ARDL) approach to investigate both short-run and long-run dynamics between the variables. The choice of the Panel ARDL model is particularly appropriate for three main reasons. First, it allows for the estimation of long-run equilibrium relationships even when the variables are integrated of mixed orders $I(0)$ and $I(1)$. Second, it captures heterogeneous short-run dynamics across countries while imposing homogeneity in long-run coefficients. Third, it is well-suited for relatively small sample sizes and balanced panel structures, which characterize the dataset used in this study (Pesaran, Shin, Smith, 1999).

3.1. Data sources

This study relies on secondary data obtained from internationally recognized databases. Financial development (FD) is measured using the Financial Development Index provided by the International Monetary Fund (IMF, 2022), which captures the depth, access, and efficiency of financial institutions and markets. Poverty (PVT) is proxied by a composite index obtained from the Economic and Social Commission for Western Asia (ESCWA, 2022), while human development (HDI) is measured using the Human Development Index, which reflects key dimensions such as health, education, and living standards.

All variables are normalized between 0 and 1, ensuring comparability across countries and over time. The dataset consists of 248 observations (8 countries $\times$ 31 years), forming a balanced panel suitable for dynamic econometric analysis.

Table 1. Variables, data sources and measurements

Variables	Source	Measurement
Dependent Variable		
Financial Development Index (FD)	(IMF, 2022)	This index (0–1) measures a country's financial development based on institutions and markets across depth, access, and efficiency.
Independent Variables		
Poverty Rate (PVT)	(ESCWA, 2022)	A composite index ranging from 0 to 1, where 1 indicates the highest level of poverty.
Human Development Index (HDI)		A composite index ranging from 0 to 1, where 1 denotes the pinnacle of human development.

Source: Prepared by authors.

3.2. Empirical methodology

To empirically assess the relationship between the variables, the study follows a structured econometric procedure consisting of three main steps.

3.2.1. Panel Unit Root Tests

The first step involves testing the stationarity properties of the variables to determine their order of integration. This is essential to ensure the validity of the Panel ARDL model, which requires that variables are integrated at level $I(0)$ or first difference $I(1)$, but not at second difference $I(2)$.

Two complementary tests are employed:

- The Levin-Lin-Chu (LLC) test, which assumes a common unit root process across cross-sections
- The Im-Pesaran-Shin (IPS) test, which allows for heterogeneity across countries

These tests provide robust evidence regarding the stationarity characteristics of the variables.

3.2.2. Panel Cointegration Tests

Following the unit root analysis, panel cointegration tests are conducted to examine whether a long-run equilibrium relationship exists between poverty, human development, and financial development. This study employs three widely used tests:

- The Kao residual-based test
- The Pedroni test
- The Westerlund test

These methods account for cross-sectional heterogeneity and provide complementary evidence on the existence of cointegration among the variables.

3.2.3. Panel ARDL Estimation and Model Selection

The Panel ARDL model is estimated using three alternative estimators: Mean Group (MG), Pooled Mean Group (PMG), and Dynamic Fixed Effects (DFE). These estimators allow for the identification of long-term coefficients as well as short-term dynamics, including the rate of adjustment toward equilibrium via the Error Correction Term (ECT). To determine the most efficient and consistent estimator among the three, the Hausman Test is applied. Finally, a country-specific short-run analysis is performed using the individual Error Correction Model (ECM) coefficients to evaluate the variability of impacts across the eight Arab African countries.

4. RESULTS AND DISCUSSION

The empirical results of the study are presented and discussed in this section, with particular attention to the examination of the connection between poverty, financial development, and human development within the framework of Arab African countries.

4.1. Descriptive Statistics

Before proceeding with the econometric estimation, it is essential to examine the statistical characteristics of the variables. Table 2 presents the descriptive statistics for the sampled Arab African countries over the period 1991-2021. The study utilizes a balanced panel of 248 observations, providing a robust foundation for capturing the long-term dynamic interactions between the variables.

Table 2. Summary of Statistical Characteristics for the Panel Data

Variable	Obs	Mean	Std. Dev.	Min	Max
FD	248	0.1591269	0.0905971	0.019629	0.4341726
PVT	248	0.4053038	0.1008751	0.1869885	0.6334986
HDI	248	0.5560887	0.1155642	0.33	0.75

Source: Stata 15 software output.

The descriptive results reveal significant disparities in the levels of financial and social development among the sampled countries.

The financial development index (FD) shows a mean of 0.159, with a relatively low maximum value of 0.434, indicating that the financial sectors in most Arab African countries are still in the developing stages and characterized by moderate depth and access.

The poverty rate (PVT) exhibits a mean of 0.405, reflecting the persistent socio-economic challenges in the region. The variation between the minimum (0.186) and maximum (0.633) suggests a heterogeneous landscape where some countries have made significant strides in poverty alleviation while others remain highly vulnerable. Similarly, the human development index (HDI) averages 0.556, falling within the "medium human development" category according to UNDP standards. The standard deviation of 0.115 for HDI indicates a moderate level of divergence in education, health, and living standards across the panel, which justifies the use of heterogeneous estimators like the PMG to capture these country-specific differences.

4.2. Panel unit root tests

Panel unit root tests are used to assess the variables' stationarity characteristics in order to guarantee the correctness of the estimate procedure. In particular, the Im-Pesaran-Shin (IPS) test permits heterogeneous unit root processes among panel units (Im, Pesaran, Shin, 2003), but the Levin-Lin-Chu (LLC) test is used under the presumption of a common unit root across countries (Levin, Lin, Chu, 2002). The alternative hypothesis proposes stationarity in both tests, while the null hypothesis argues the existence of a unit root. The Panel ARDL model is deemed suitable if the variables are determined to be stationary at level $I(0)$ or at first difference $I(1)$. The following table displays the outcomes of various tests.

Table 3. The panel unit root's result

Variable	Levin-Lin-Chiu (LLC)		Im-Pesaran-Shin (IPS)	
	Level	1st Difference	Level	1st Difference
FD	-0.7518 (0.2261)	-9.3095 (0.0000)	0.9837 (0.1626)	-9.1836 (0.0000)
PVT	-1.3670 (0.0858)	-3.4752 (0.0003)	1.0812 (0.8602)	-6.1034 (0.0000)
HDI	-4.2951 (0.0000)	-3.8049 (0.0001)	-0.6451 (0.2594)	-8.8288 (0.0000)

Note: those in () are p-Value

Source: Stata 15 software output.

The variables in the study show mixed stationarity qualities, according to the unit root test findings shown in table 3. The Levin-Lin-Chu test indicates that the financial development index and poverty rate variables are non-stationary at level $I(0)$ but become stationary after first differencing $I(1)$, but the human development index is stationary at level $I(0)$. The Im-Pesaran-Shin test, on the other hand, shows that all variables achieve stationarity at the first difference $I(1)$ after being non-stationary at level $I(0)$. These results support the suitability of using the Panel ARDL model to examine the variables' short- and long-term associations (Pesaran, Shin, Smith, 1999).

4.3. Panel cointegration tests

The Kao, Pedroni, and Westerlund cointegration tests are used in the study to determine whether poverty, human development, and financial development have a long-term equilibrium relationship. These tests allow for various assumptions about homogeneity among panel units and take cross-sectional dependence into consideration. Cointegration between the variables is evident when the null hypothesis is rejected in every test. The findings are shown in the table below.

Table 4. The panel's cointegration result

Test	Statistics	p-value	Decision
Kao Test			
Modified Dickey-Fuller	-1.5416	0.0061	H ₁ : A long-run cointegrating relationship exists (Kao, 1999)
Dickey-Fuller	-2.2967	0.0108	
Augmented Dickey-Fuller	-2.5397	0.0055	
Unadjusted modified Dickey-Fuller	-1.7309	0.0417	
Unadjusted Dickey-Fuller	-2.3804	0.0086	
Pedroni Test			
Modified Phillips-Perron	-0.9573	0.0169	H ₁ : A long-run cointegrating relationship exists (Pedroni, 2004)
Phillips-Perron	-3.0197	0.0013	
Augmented Dickey-Fuller	-1.9255	0.0271	
Westerlund Test			
Variance ratio	-1.8572	0.0316	H ₁ : A long-run cointegrating relationship exists (Westerlund, 2005)

Source: Stata 15 software output.

Table 4's cointegration test results provide compelling evidence of a long-term equilibrium relationship between poverty, financial development, and human development in the eight Arab African countries that are the subject of the study. All five statistics from the Kao test are statistically significant at the 5% level, supporting the rejection of the null hypothesis of no cointegration. Similarly, the Pedroni test confirms this finding, as all three statistics yield significant p-values, indicating the presence of a long-run association among the variables. These findings are further supported by the Westerlund variance ratio test. All things considered, these consistent results across several tests confirm that the Panel ARDL technique is appropriate for analyzing the dynamic relationship between the variables in the study.

4.4. Panel ARDL modeling

Based on the selected lag structure of (1,0,0), the Panel ARDL model used in this study is specified as follows:

Based on the selected optimal lag structure of (1, 0, 0), where the dependent variable is lagged by one period (p=1) and the explanatory variables are included at their levels (q=0), the Panel ARDL model is specified as follows:

$$\Delta FD_{it} = \alpha_i + \sum_{p=1}^1 \beta_p \Delta FD_{i,t-p} + \sum_{q=0}^0 \gamma_{1q} \Delta PVT_{i,t-q} + \sum_{q=0}^0 \gamma_{2q} \Delta HDI_{i,t-q} + \delta_i EC_{i,t-1} + \varepsilon_{it} \quad (1)$$

$$\Delta FD_{it} = \alpha_i + \beta_1 \Delta FD_{i,t-1} + \gamma_1 \Delta PVT_{i,t} + \gamma_2 \Delta HDI_{i,t} + \delta_i EC_{i,t-1} + \varepsilon_{it} \quad (2)$$

Where:

- FD_{it} – Financial development index for country i at time t.
- PVT_{it}, HDI_{it} – Poverty and human development indicators.
- $EC_{i,t-1}$ – Error correction term.
- ε_{it} – Error term.

As per the methodological requirements, the text explicitly confirms that equation (2) is estimated with a lag of (p=1) for the dependent variable and (q=0) for the independent variables to ensure the consistency of the results.

4.5. The Hausman Test and Panel ARDL model estimators

The results of the Panel ARDL model estimate utilizing the Mean Group (MG), Pooled Mean Group (PMG), and Dynamic Fixed Effects (DFE) techniques are shown in this section. The study examines the immediate and long-term impacts of human development (HDI) and poverty (PVT) on financial development (FD) in the chosen Arab African countries. The following table provides a summary of the empirical findings.

Table 5. Result of Panel ARDL model estimation

Variable	Estimator					
	Mean Group (MG)		Pool Mean Group (PMG)		Dynamic Fixed Effects (DFE)	
	Coefficient	p-Value	Coefficient	p-Value	Coefficient	p-Value
Long Run						
PVT	0.29714	0.319	-0.18106	0.000	-0.19618	0.207
HDI	0.15318	0.400	0.0495	0.029	0.13352	0.381
Short Run						
ECT	-0.47514	0.000	-0.30169	0.000	-0.14574	0.000
D(PVT)	-0.04889	0.792	0.03030	0.801	-0.00773	0.897
D(HDI)	-0.21417	0.357	-0.29336	0.221	-0.17000	0.235
Cons_	0.02975	0.716	0.05801	0.000	0.02620	0.180

Source: Stata 15 software output.

To identify the most appropriate estimator for analyzing the impact of poverty and human development on financial development, the Hausman test is employed. This statistical procedure guides the selection of the optimal model. A p-value greater than 5% indicates no systematic difference, thereby supporting the PMG estimator due to its efficiency under homogeneity in long-run parameters. Conversely, a p-value below 5% suggests preference for the MG or DFE estimators, which allow for heterogeneity across panel units (Hausman, 1978). The outcomes of the Hausman test are summarized in the following table.

Table 6. Result of the Hausman test

Trade-off	Statistics	p-Value	Decision
MG/PMG	1.97	0.3735	PMG is more efficient than the MG

Source: Stata 15 software output.

The comparison between the MG and PMG estimators yielded a p-value of 0.3735. Since this result is greater than the 0.05 significance level, the null hypothesis is not rejected, confirming that the PMG estimator is statistically more efficient and appropriate for this study. Consequently, the detailed economic interpretation and discussion of these findings are presented in the following section.

4.6. Discussion of the PMG-based findings

A statistically significant long-term relationship between poverty (PVT), human development (HDI), and financial development is revealed by the (PMG) estimator's findings. In particular, poverty has a detrimental and statistically significant effect over the long run (coefficient = -0.18106, $p = 0.000$), suggesting that greater poverty prevents the financial system from becoming deeper and more extensive. The reduced ability of those living in poverty to save, invest, and engage in the official financial sector is the cause of this effect. Human development, on the other hand, has a positive and significant long-term effect (coefficient = 0.0495, $p = 0.029$), indicating that spending on living standards, healthcare, and education supports the long-term growth of financial markets by increasing the user base of financial services and promoting wider financial inclusion.

In the short run, the error correction term ($ECT = -0.30169$, $p = 0.000$), indicate that approximately 30% of any deviation from the long-run equilibrium is corrected within a single period, reflecting a relatively rapid pace of adjustment. This suggests that the system is dynamically stable and tends to revert to its long-run path even after short-term disturbances. Despite this stability, the estimated short-run coefficient for poverty (0.03030, $p = 0.801$) is statistically insignificant, implying that changes in poverty levels do not exert an immediate influence on financial development. This could be explained by the nature of short-term poverty alleviation policies, such as cash transfers or subsidies, which may temporarily mitigate the effects of poverty without necessarily impacting financial behavior or formal financial participation. Moreover, financial institutions may not respond swiftly to poverty-related shifts due to rigidities in credit access, risk aversion, or the lack of adaptive financial instruments tailored to vulnerable populations.

Similarly, the short-run coefficient of human development (-0.29336, $p = 0.221$) is also statistically insignificant and unexpectedly negative. This can be attributed to the time-lagged nature of improvements in human capital. Investments in education and health typically yield results over an extended period, and their impact on financial development

through enhanced financial literacy, increased employment, or improved income generation takes time to materialize. Hence, the absence of a significant short-run effect is consistent with the structural and cumulative character of human development processes, which are not immediately reflected in short-term financial indicators.

Overall, these findings underscore the importance of long-term policy strategies aimed at reducing poverty and enhancing human development, as both serve as foundational drivers for building a more inclusive and resilient financial system that supports sustainable financial development.

4.7. Panel Granger Causality Analysis

To further validate the causal directions between poverty (PVT), human development (HDI), and financial development (FD), and to address the methodological limitations of the ARDL model regarding strict causality, this study performs the Dumitrescu-Hurlin (2012) panel Granger causality test. While the ARDL model confirms long-term cointegration, it does not explicitly determine the direction of causality. Therefore, this test is essential to substantiate the study's primary thesis: that social development acts as a driver for financial expansion in Arab African countries.

Table 7. Results of Dumitrescu-Hurlin panel Granger causality test

Null Hypothesis (H_0)	W-bar	Z-bar	p-Value
PVT does not Granger-cause FD	6.3053	10.6105	0.0000
FD does not Granger-cause PVT	4.6122	7.2245	0.0000
HDI does not Granger-cause FD	5.8275	9.6550	0.0000
FD does not Granger-cause HDI	1.7271	1.4543	0.1459

Source: Stata 15 software output.

The causality results presented in Table 7 provide robust evidence supporting the “reverse perspective” proposed in this study. Firstly, a bidirectional causality is observed between poverty (PVT) and financial development (FD), with p-values of 0.0000 in both directions. This suggests that while poverty alleviation fosters financial expansion by increasing the participation of vulnerable groups in the formal financial sector, financial development, in turn, contributes to poverty reduction through improved access to credit and financial services.

More importantly, the results reveal a unidirectional causality running from human development (HDI) to financial development (FD) ($Z\text{-bar} = 9.6550$, $p = 0.0000$), whereas the reverse relationship is statistically insignificant ($p = 0.1459$). This finding confirms that improvements in education, health, and living standards are foundational drivers that lead to the expansion and efficiency of the financial sector in Arab African countries. This empirical evidence directly addresses the concerns regarding causal direction, proving that social progress is not merely an outcome but a critical precursor to financial sector development in the region.

4.8. PMG-Based short-run results for individual countries

Using the Pooled Mean Group (PMG) methodology, the short-term findings for each Arab African countries are shown separately in the section that follows. These findings contribute to a better understanding of the local dynamics of financial development throughout the continent by highlighting the fundamental variations between countries in

terms of how they immediately respond to changes in poverty and human development indicators.

Table 8. PMG Individual countries short-run results

Countries	Ect	PVT	HDI
Algeria	-0.100908 (0.0064)	-0.25643 (0.016)	-0.415208 (0.002)
Comoros	-0.423893 (0.0000)	-0.154754 (0.042)	-0.19276 (0.073)
Djibouti	-0.634039 (0.0000)	0.067213 (0.334)	0.268113 (0.019)
Egypt	-0.136103 (0.0098)	0.487524 (0.124)	-1.84994 (0.048)
Mauritania	-0.361077 (0.001)	-0.026419 (0.693)	-0.33971 (0.034)
Morocco	-0.063284 (0.0170)	-0.150126 (0.037)	-0.023506 (0.964)
Sudan	-0.369501 (0.007)	-0.492808 (0.029)	-0.094789 (0.689)
Tunisia	-0.324746 (0.003)	0.467957 (0.099)	-0.274208 (0.004)
Note: those in () are p-Value			

Source: Stata 15 software output.

The short-run ARDL model results for the selected Arab African countries reveal significant disparities in the dynamic relationship between poverty, human development, and financial development, reflecting the diverse economic and institutional structures across these countries. All countries exhibit negative and statistically significant error correction terms, confirming the existence of a stable long-run equilibrium relationship, with varying speeds of adjustment (slowest in Morocco and Algeria, and fastest in Djibouti and Comoros).

Regarding poverty, it has a detrimental and substantial impact on Sudan, Algeria, Morocco, and Comoros, suggesting that deteriorating living conditions undermine individuals' capacity to engage with the formal financial system through saving, borrowing, or investing. In contrast, poverty shows no significant effect in Djibouti, Egypt, Mauritania, and Tunisia, possibly due to temporary social interventions or the limited effectiveness of financial channels in absorbing poverty fluctuations.

On the other hand, human development exhibits a negative and significant impact in Algeria, Egypt, Tunisia, and Mauritania, which may reflect a mismatch between educational and health outcomes and the demands of financial markets, or institutional fragmentation between social development and the financial system. Conversely, a positive and significant effect of human development is observed only in Djibouti, indicating effective investment in human capital to promote financial inclusion. In the remaining countries, the effect of human development is statistically insignificant.

Overall, the findings clearly indicate that while the relationship between poverty and financial development is stable, its direction and intensity are context-specific. In contrast,

the effect of human development appears more complex, requiring a supportive institutional environment to translate social progress into meaningful financial sector development.

5. CONCLUSIONS

This study investigated the relationship between poverty, human development, and financial development in eight Arab African countries from 1991 to 2021. Departing from traditional literature that primarily assesses the impact of financial expansion on social outcomes, this research adopted a “reverse perspective” to examine how social indicators act as foundational drivers for financial sector development.

The empirical results, obtained through the PMG-ARDL estimator, reveal a statistically significant long-run equilibrium relationship among the variables. Specifically, poverty exerts a negative impact on financial development, as high poverty rates restrict the population's capacity to save, invest, and participate in formal financial markets. Conversely, human development exhibits a positive and significant long-term effect, underscoring that improvements in health and education are essential precursors to financial deepening and inclusion. While short-run effects remain statistically insignificant due to the structural and time-lagged nature of social investments, the system exhibits dynamic stability with approximately 30% of deviations from long-run equilibrium being corrected in each period. Furthermore, the Dumitrescu-Hurlin causality test confirms a unidirectional causal flow from human development to financial development and a bidirectional relationship between poverty and finance, providing robust evidence that social progress is a critical precursor to financial evolution in the region.

Based on these findings, the study proposes the following actionable recommendations tailored to the Arab African institutional context:

- **Integrating Social-Financial Literacy Programs:** Since human development acts as a long-term driver of financial sector expansion, governments should align educational reforms with financial literacy initiatives. Integrating financial technology (FinTech) education into national curricula will enhance the cognitive abilities and financial literacy necessary for citizens to effectively utilize formal financial services.
- **Transitioning to Productive Inclusion Models:** To leverage the bidirectional relationship between poverty and finance, policymakers should shift from traditional cash transfers to "productive inclusion" models. This involves linking social safety nets with access to micro-credit and formal savings accounts to reduce credit risk and stabilize household income capacity.
- **Bridging Institutional Fragmentation:** There is an urgent need to reduce the gap between social development policies and financial sector strategies. Governments should develop unified digital infrastructures that connect social welfare registries with financial systems to lower information asymmetries and facilitate inclusive financial expansion.
- **Targeted Regional Interventions:** Given the country-specific disparities in adjustment speeds, regional planning must be nuanced. For countries like Djibouti, where human development shows immediate positive links, scaling up human capital investment is a priority. In countries with slower adjustment, such as Algeria or Egypt, structural reforms are required to better align social progress with the evolving demands of the financial market.

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Abir MESLEM¹
Wahiba ABDERRAHIM²

ROGERS' THEORY ON DIFFUSION OF INNOVATION: AN APPROPRIATE THEORETICAL MODEL IN THE STUDY OF FACTORS INFLUENCING THE INTEGRATION OF ELECTRIC VEHICLES IN ALGERIAN MARKET

Drawing upon the Diffusion of Innovation (DOI) theory, this research investigates the determinants of electric vehicle (EV) adoption in Algeria, based on an empirical study of 394 licensed drivers. Data analysis was conducted using Structural Equation Modeling (SEM). The findings underscore that perceived relative advantage is a pivotal driver of adoption. This advantage emerges as a critical determinant, underpinned by expectations of long-term fuel savings and the superior energy efficiency inherent to these vehicles. Furthermore, perceived triability exerts a significant positive influence on adoption, suggesting that the opportunity to personally experience EV technology reduces the risk associated with this transition. These results provide strategic insights for Algerian policymakers to formulate regulations aligned with consumer behavior, while enabling EV manufacturers and importers to calibrate their strategies in accordance with market expectations.

Keywords: innovation, Rogers theory, sustainability, electric vehicle, adoption.

1. INTRODUCTION

Anthropogenic greenhouse gas (GHG) emissions represent a critical existential threat, driving global environmental degradation and climate instability. Within this global carbon footprint, the transport sector emerges as a primary culprit, ranking second only to the industry and energy sectors in total emissions (Grégoire, 2026). It accounts for approximately 16% of annual global GHGs, with output reaching an estimated 09 gigatonnes (Gt) of CO₂ in 2025. Notably, road transport is responsible for 94.6% of these

¹ Abir Meslem, High School of Commerce (ESC-Alger), Algeria; e-mail: meslem.abir26@gmail.com (corresponding author). ORCID: 0009-0007-1960-0179.

² Wahiba Abderrahim, High School of Commerce (ESC-Alger), Algeria; e-mail: abderrahim.wahiba95@gmail.com. ORCID: 0009-0008-6227-7335.

sectorial emissions, a direct consequence of fossil fuel combustion (gasoline, diesel, and LPG). Further statistics specify that these emissions are predominantly generated by passenger cars (52%), heavy-duty vehicles (25%), and light commercial vehicles (15%) (Yvan, Marie-Claire, 2025).

In response, a paradigm shift in international environmental policy has prioritized the decarbonization of mobility. The electrification of internal combustion engine vehicles (ICEVs) has been identified as a cornerstone of this energy transition. For the purpose of this research, an electric vehicle (EV) is defined as any platform utilizing one or more electric motors for propulsion, regardless of the specific hybridization or battery technology employed. While global efforts to increase EV market share have intensified, Algeria has recently embarked on an ambitious national initiative to promote electric mobility as part of its strategic commitment to sustainable development.

The transition from ICEVs to EVs in the Algerian context hinges fundamentally on consumer adoption – a complex process that dictates the ultimate success or failure of sustainable technology deployment. Although the existing literature has extensively examined EV adoption through technological, socio-cultural, and psycho-motivational lenses, a significant research gap persists: empirical evidence within the Algerian market remains virtually non-existent. This study addresses this scholarly void at a critical juncture, as Algeria initiates regulatory and industrial frameworks for the importation and manufacturing of EVs.

Drawing upon the Diffusion of Innovation (DOI) theory, this research investigates the determinants of EV adoption among Algerian consumers. By providing a robust empirical analysis, this study aims to offer actionable insights for policymakers and industry stakeholders to refine strategies that facilitate transport decarbonization and accelerate Algeria's socio-technical transition toward cleaner energy.

While the Diffusion of Innovation (DOI) theory has been widely studied in mature markets, its application in emerging economies remains limited. The primary scientific contribution of this study is threefold: first, it provides the first empirical investigation of EV adoption determinants within the Algerian market, filling a significant scholarly void at a time when the nation is actively defining its regulatory and industrial framework for sustainable mobility. Second, by validating the applicability of the DOI model in a unique North African context, this research offers a nuanced understanding of how specific innovation attributes – such as perceived relative advantage and triability – drive behavior in non-Western settings. Finally, this study offers critical, evidence-based insights that bridge the gap between abstract theoretical models and the pragmatic strategic needs of Algerian policymakers and industry stakeholders during this transition.

2. LITERATURE REVIEW

2.1. Electric Vehicle

The environmental and public health implications of internal combustion engine vehicles are primarily driven by the emission of carbon oxides (CO, CO₂), nitrogen oxides (NO_x), and unburned hydrocarbons (HC). While incremental improvements in ICEV efficiency and low-emission technologies offer partial mitigation (Hankache, 2008), the paradigm shift toward Electric Vehicles represents a more fundamental solution. Defined broadly as platforms powered – partially or entirely – by electricity (Jansson, 2011), the current EV landscape is categorized by diverse power train architectures and energy

storage systems, primarily bifurcating into Battery Electric Vehicles (BEVs) and Hybrid Electric Vehicles (HEVs).

BEVs represent the pinnacle of transport decarbonization, utilizing high-capacity traction batteries to achieve zero tailpipe emissions. Although often perceived as a modern innovation, the BEV's conceptual origins date back to 1834 with Thomas Davenport's prototype, which already sought to address the inherent limitations and ecological externalities of finite fuel reserves (Pascal, Dominique, 2006). Technically, the BEV's fully electrified drive train can be integrated into various charging infrastructures, ranging from standard 'plug-in' grid interfaces to advanced photovoltaic systems (Proff, Kilian, 2012). Despite superior torque and energy recovery capabilities, the mass adoption of BEVs remains hampered by structural bottlenecks such as range anxiety, protracted charging durations, and high acquisition costs (Lénaïc, 2017). Historically, these constraints restricted EVs to urban micro-mobility; however, the evolution from lead-acid (70-120 km) to modern lithium-ion technologies (up to 395 km) has significantly expanded their operational viability (Aiman, 2008).

In contrast, HEVs utilize dual-energy architecture, coupling an ICE with an electric motor to optimize efficiency through regenerative braking – a configuration particularly effective for urban drive cycles (Schuitema, Anable, Skippon, Kinnear, 2013). Given the current complexities of total electrification, HEVs serve as a critical 'bridge technology' or transitional alternative (Tedjani, 2016). This landscape has further diversified since 2007 with the emergence of Plug-in Hybrids (PHEVs) and Range-Extended Electric Vehicles (REEVs). While PHEVs allow for external grid recharging to supplement the ICE (Sovacool, Hirsh, 2009), REEVs function essentially as series hybrids where the ICE acts solely as an on-board generator to maintain battery state-of-charge, never directly engaging in traction (Bradley, Frank, 2009).

2.2. Innovation and electric vehicle adoption

Understanding the adoption of technological innovations within the automotive sector has been a cornerstone of multidisciplinary research for over half a century. The primary objective of this paper is to map the adoption process and identify the critical factors influencing consumer behavior, thereby predicting the market trajectory of emerging technologies. In this research, Electric Vehicles are examined as a transformative innovation requiring a fundamental shift in traditional consumer paradigms.

The literature consistently identifies the conceptualization by Rogers (1962) as the seminal reference for defining innovation adoption. According to this framework, adoption is characterized as the decision to make full use of an innovation as the best course of action available, implying a state of continuous usage. This perspective is further refined by Robertson (1971), who posits that adoption transcends mere trial or experimental purchase; instead, it represents a long-term psychological and behavioral commitment. Furthermore, Rogers (1983) describes adoption as a dynamic mental sequence, whereby a decision-making unit – whether an individual or a firm – progresses from initial knowledge and attitude formation to the final decision and subsequent confirmation within a specific social system.

To operationalize these theoretical foundations, this study focuses on the pre-purchase stage of the adoption process. Drawing upon DOI theory and existing empirical research in the automotive domain, we define electric vehicle adoption as the individual or collective decision to transition from internal combustion engine vehicles to electric vehicles,

characterized by the commitment to use the EV as a primary and continuous mode of transportation for one's mobility needs (Adapted from Rogers [1962]).

While numerous theoretical models exist to explain such transitions, this article primarily adopts the Diffusion of Innovation theory. DOI remains a dominant framework in the scientific literature due to its robust capacity to explain the multifaceted nature of adoption across diverse innovative categories, providing the necessary analytical depth to examine the specificities of the Algerian market.

2.3. Diffusion of innovation theory

The transition toward sustainable mobility is fundamentally a process of social and technical realignment. To analyze this shift, this study is based on the Diffusion of Innovation theory, a multidimensional paradigm developed by Rogers to elucidate the mechanisms through which novel ideas, practices, or objects transition from discovery to widespread social integration. Unlike traditional linear models, DOI conceptualizes diffusion as a systemic process where information regarding a technological novelty is communicated over time through specific channels among members of a social system. While originally applied to agricultural and social sectors, the model's versatility has seen it become a benchmark for examining complex technological shifts, including information systems (Cheng, Kao, Lin, 2004; Doyle, Garrett, Currie, 2014), healthcare (Haider, Kreps, 2004), and, more recently, the global adoption of electric vehicles (EVs) (Noel, Sovacool, Kester, Rubens, 2019; Schuitema, Anable, Skippon, Kinnear, 2013).

According to Rogers, diffusion is not a passive occurrence but an active communication process. It represents a collective social evolution where information is shared among members of a system to reach a mutual understanding of an innovation's utility (Rogers, 1962). To succeed, innovation must navigate four critical pillars: a) the innovation itself, b) the communication channels used, c) the time required for decision-making, and, d) the nature of the social system.

The central tenet of DOI is that the rate of adoption is driven by characteristics of innovation. Rogers (1995; 2003) defines the characteristics of innovation as causes for the adoption of innovation at different levels. These characteristics set by Rogers are the following:

- According to Rogers, relative advantage is the degree to which an innovation is perceived as superior to the idea, or practice it replaces. The bigger the perceived relative advantage of innovation, the faster the level of its adoption will be. The relative advantage can be financial or non-financial, encompassing economic benefits, social prestige, pleasure terms and physical comfort.
- Compatibility is the degree to which the innovation aligns with the potential adopter's existing values, past experiences, and specific needs. Innovations that conflict with established social norms or technical practices face significantly slower adoption rates.
- Complexity acts as a significant barrier, as innovations perceived as difficult to understand or utilize require potential adopters to develop new skills and often face skepticism.
- To mitigate the inherent uncertainty of the innovation, triability allows potential adopters to experiment with the technology on a limited basis.

- In Rogers's view, observability is the degree to which the results of innovation are more visible than others. If the results of an innovation are distinct and easily noticed among peers, it is more likely for them to adopt it.

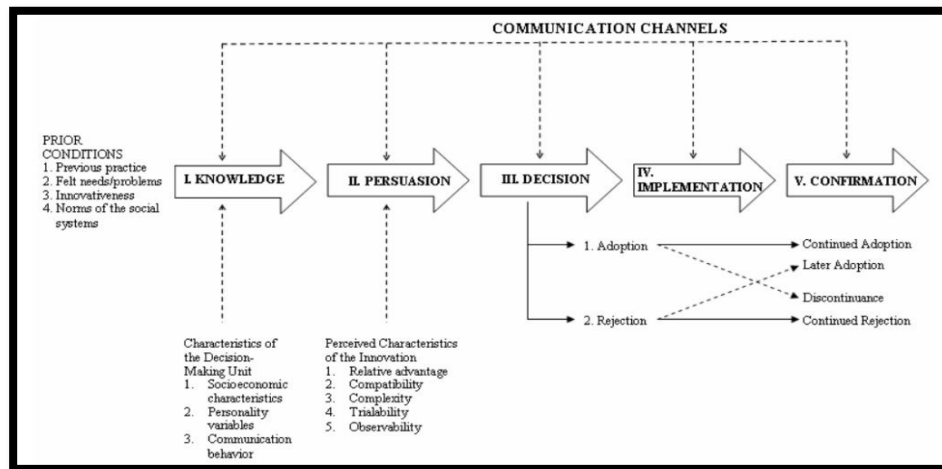


Figure 1. Diffusion of Innovation theory (DOI)

Source: (Rogers, 1983).

The other element of innovation diffusion is the process in which individuals create and share information with each other through communication channels in order to reach a mutual understanding on innovation (Rogers, 1983). This process begins with initial knowledge and experience and progresses through a persuasion stage, where the individual forms a favorable or unfavorable attitude by evaluating the characteristics of innovation. This evaluation culminates in a decision to adopt or reject the technology, followed by an implementation stage where the user focuses on practical logistics, and a final confirmation stage to reinforce the choice within their social network (Wahiba, Mohammed, Abir, 2023). The timing of this process is heavily influenced by the individual's innovativeness. Innovativeness refers to the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system utility (Rogers, 1962). This definition serves as the primary criterion for categorizing consumers based on their receptivity to novelty. According to Rogers, this trait is not uniform across a population but varies significantly, allowing for the classification of individuals into five distinct adopter categories – innovators, early adopters, the early majority, the late majority, and laggards – each defined by their degree of skepticism, economic necessity, or reliance on opinion leaders.

By synthesizing these elements, the DOI framework provides the necessary analytical depth to examine the complex socio-technical determinants of electric vehicle adoption in the Algerian market.

3. CONCEPTUAL FRAMEWORK

The transition toward electric mobility in emerging markets like Algeria is fundamentally driven by how consumers cognitively evaluate the specific characteristics of the innovation. The theoretical model adopted in this study is strictly grounded in the classic framework established by Rogers (1962; 1983). We selected the five core perceived characteristics of innovation – relative advantage, complexity, compatibility, triability, and observability – as they represent the comprehensive set of attributes proposed by Rogers to explain the diffusion of any innovation. Our objective is to rigorously examine the robustness of this foundational model within the nascent Algerian electric vehicle market. By adhering to this established framework, we isolate the fundamental drivers of consumer adoption without introducing confounding variables, thereby providing a clear, theoretically sound benchmark for the Algerian automotive context.

Perceived relative advantage serves as a primary determinant for technological transitions. In the automotive sector, this advantage is multidimensional, encompassing functional performance, carbon emission reductions, and long-term economic efficiency (Fanchao, Eric, Bert, 2017). Empirical evidence suggests that as consumers recognize the distinct benefits of electric vehicles (EVs) – such as lower operational costs and environmental contribution – the rate of adoption increases significantly (Jansson, 2011; Peters, Dütschke, 2014). In the Algerian context, where the state is implementing new frameworks for EV deployment and sustainable mobility, these perceived gains are expected to be a pivotal driver of consumer interest. Based on this reasoning, we propose:

H1: *Perceived relative advantage exerts a positive influence on electric vehicles adoption.*

In contrast to the benefits of relative advantage, complexity represents a structural barrier to innovation diffusion and adoption. Because EVs represent a high-involvement eco-innovation requiring significant technical and operational interaction, they are often perceived as more demanding than conventional internal combustion engine vehicles (Antil, 1984; Ozaki, 2011). Prior research indicates that when a technology is perceived as technically opaque, consumers are prone to rejection to avoid the cognitive cost of acquiring new skills (Ullah, Aimin, Ahmed, 2018). Given that EVs involve novel charging routines and energy management systems that differ from traditional fueling habits, this perceived difficulty is expected to act as a deterrent. Consequently, we formulate the following:

H2: *Perceived complexity exerts a negative influence on electric vehicles adoption.*

The adoption of sustainable innovations is also deeply rooted in perceived compatibility, which refers to the consistency between an innovation and the past experiences, values, and needs of potential adopters (Rogers, 1995). Compatibility serves as a psychological bridge; for pro-environmental consumers, the EV is not merely a vehicle but an extension of their ethical convictions and pro-environmental identity (Egbue, Long, 2012). Conversely, individuals whose values do not align with ecological preservation may view the EV as incompatible with their lifestyle, leading to technology rejection (Stern, 2000). When a consumer perceives that an EV harmonizes with their daily habits and belief systems, it fosters a sense of alignment that accelerates the adoption process (Jansson, 2011). Therefore, we suggest:

H3: *Perceived compatibility exerts a positive influence on electric vehicles adoption.*

For radical innovations where consumers lack prior expertise or direct experience, the ability to test and experiment with the technology before making a final commitment is

crucial. Perceived triability functions as an uncertainty-reduction mechanism, allowing potential adopters to observe the vehicle's performance firsthand and demystify its operation through "learning by doing" (Molesworth, Suortti, 2002). In emerging markets where EVs remain a novelty, the opportunity for a trial run is often more critical for non-adopters than for those already familiar with alternative fuel technologies. Consumers who perceive a greater possibility of trying or testing an EV are more likely to develop the behavioral confidence required to transition away from traditional vehicles (Jansson, 2011). Thus, we posit:

H4: *Perceived triability exerts a positive influence on electric vehicles adoption.*

The final determinant in the diffusion process is observability. In the contemporary automotive landscape, EVs are frequently perceived as "vehicles of the future," carrying a strong symbolic value related to sustainable development and modern lifestyles (Zhou, Lim, He, Lin, Chen, 2019). When the tangible outcomes of EV adoption – such as reduced subsistence costs and visible environmental contributions – are easily noticed by peers, it enhances social trust and motivates others to follow suit (Lai, Liu, Sun, Zhang, Xu, 2015). This visibility stimulates interpersonal communication and reinforces the technology's legitimacy within the community (Caperello, Kurani, 2011). Based on these observations, we conclude:

H5: *Perceived observability exerts a positive influence on electric vehicles adoption.*

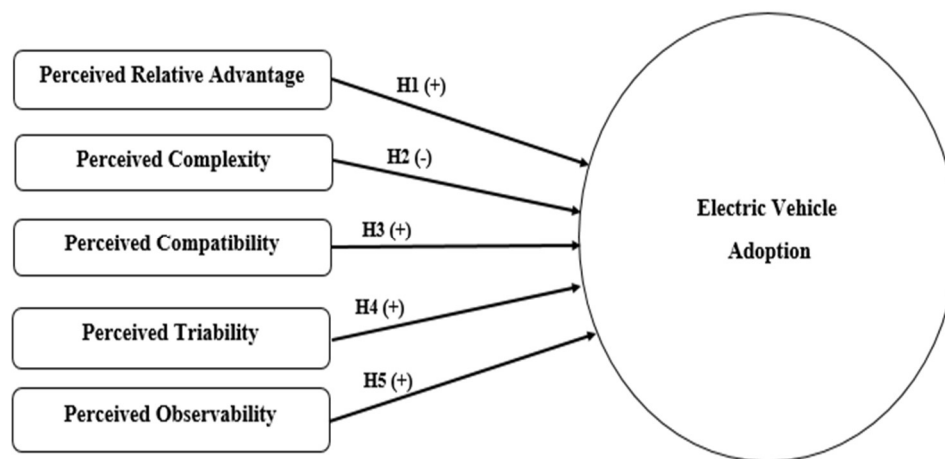


Figure 2. The conceptual framework

Source: Authors.

4. METHODOLOGY

The primary objective of this study is to examine how perceived innovation characteristics influence EVs adoption within the Algerian context.

This study adopted a quantitative, survey-based research design to assess the causal relationships between perceived relative advantage, complexity, compatibility, testability, observability, and EV adoption.

Data was collected primarily using a structured questionnaire administered to current holders of a valid driver's license. The questionnaire was distributed online through social

media platforms (LinkedIn, Facebook, and Instagram) in different languages (Arabic, French, and English) to ensure better comprehension among Algerian consumers.

The developed questionnaire measures the model variables using a 5-point Likert scale (1 as strongly disagree and 5 as strongly agree). The measurement items were adapted from existing literature to maintain consistency with prior studies. Items measuring perceived relative advantage were adopted from Kim et al. (2018). Items measuring perceived complexity were adopted from Davis (1989). Items measuring perceived compatibility were adopted from Petschnig et al. (2014). Items measuring perceived triability adopted from Jansson (2011). Items measuring perceived observability adopted from Moore et al. (1991). Items measuring EVs adoption adopted from Xu et al. (2020).

A total of 394 valid responses were collected. The sample size aligns with empirical social science norms and exceeds the minimum requirement for structural equations modeling, ensuring the statistical validity of the normality distribution.

The collected data was analyzed using AMOS version 25.0 (Analysis Moment of Structures). Partial Least Squares Structured Equation Modeling (SEM-PLS) was conducted to test direct relationships among the variables. Construct reliability was evaluated through Cronbach's alpha, composite reliability (CR), and the average variance extracted (AVE). Convergent and discriminant validity were subsequently examined by analyzing factor loadings and the square root of the AVE. Based on the established thresholds and evaluation criteria, the measurement model was assessed to ensure that the constructs demonstrated sufficient reliability and validity to support hypothesis testing. Finally, the structural model was estimated, and the proposed hypotheses were tested.

5. RESULTS

The collected data was analyzed to test the study's hypotheses regarding the between perceived relative advantage, complexity, compatibility, triability, observability, and EV adoption. Structural equation modeling analysis examines the strength and significance of these causal relationships.

5.1. Measurement model analysis results

To ensure the constructs' reliability, the composite reliability and Cronbach's alpha values were calculated. Based on the recommended values put forward by Hair et al (2017), these values exceed 0.7, indicating the acceptance of study's reliability. Using average variance extracted and factor loadings, the convergent validity was calculated, all of which should exceed 0.5 as indicated by Hair et al. (2017) and Fornell, Larcker (1981). The values of AVE of all constructs exceed 0.5, and the values of all factor loadings are above 0.5. Table 1 shows the results of reliability and convergent validity of all constructs.

The discriminant validity of the model was determined based on the guidelines of Kline (2005). On the diagonal of each construct, the square root of the construct's AVE was greater than its correlations with other constructs in the model (Fornell, Larcker, 1981), indicating an acceptable degree of discriminant validity (see Table 2).

Following the results obtained above, we can assume that the measurement model meets the required levels of reliability and validity.

Table 1. Reliability and convergent validity

Construct	Items	Factor Loadings	Cronbach's alpha	CR	AVE
<i>Perceived relative advantage</i>	PRA1	0.863	0.766	0.781	0.685
	PRA2	0.746			
	PRA3	0.888			
	PRA4	0.721			
<i>Perceived complexity</i>	PC1	0.901	0.867	0.870	0.790
	PC2	0.895			
	PC3	0.871			
<i>Perceived compatibility</i>	PCo1	0.891	0.930	0.934	0.826
	PCo2	0.915			
	PCo3	0.898			
	PCo4	0.930			
<i>Perceived triability</i>	PT1	0.889	0.819	0.690	0.501
	PT2	0.907			
	PT3	0.521			
	PT4	0.634			
	PT5	0.535			
<i>Perceived observability</i>	PO1	0.652	0.723	0.747	0.597
	PO2	0.822			
	PO3	0.634			
	PO4	0.639			
<i>EVs adoption</i>	AEV1	0.925	0.953	0.953	0.877
	AEV2	0.940			
	AEV3	0.957			
	AEV4	0.923			

Source: Authors, from Smart PLS3 Output.

Table 2. Discriminant validity

	PRA	PC	PCo	PT	PO	AEV
<i>PRA</i>	0.828					
<i>PC</i>	0.623	0.889				
<i>Pco</i>	0.795	0.616	0.909			
<i>PT</i>	0.527	0.323	0.611	0.708		
<i>PO</i>	0.660	0.475	0.780	0.601	0.773	
<i>AEV</i>	0.643	0.437	0.695	0.622	0.632	0.946

Source: Authors, from Smart PLS3 Output.

5.2. Structural model analysis results

The structural model fit was tested using different criteria such as χ^2/df , GFI, RSMEA, PGFI, CFI, IFI and TLI. The model demonstrated an overall satisfactory model fit. The Chi-square ratio to the degree of freedom (χ^2/df) was 2.46, smaller than the threshold value

of 3.0 (Schumacker, Lomax, 2010). GFI, CFI, IFI, and TLI values were 0.927, 0.903, 0.876, and 0.921, respectively, meeting the acceptable criteria of 0.90 as a minimum (Schumacker, Lomax, 2010).

Table 3 shows the results of hypotheses testing. The results show that H1, H2, and H4 are supported at the significance levels of 0.05. Perceived relative advantage has a positive and significant effect on EV adoption ($\beta = 0.058$, $p < 0.05$). Perceived Complexity is also positively and significantly related to EV adoption ($\beta = -0.063$, $p < 0.05$). Perceived Testability has positively and significantly effects on EV adoption ($\beta = 0.054$, $p < 0.05$). Therefore, H1, H2, and H4 were all supported.

Table 3. Summary of hypotheses results

<i>Hypotheses</i>	<i>β</i>	<i>T Statistics</i>	<i>P Values</i>
H1 (Supported)	0.058	6.542	0.000
H2 (Supported)	- 0.063	3.031	0.002
H3 (Not Supported)	0.049	0.215	0.830
H4 (Supported)	0.054	2.093	0.036
H5 (Not Supported)	0.059	1.130	0.259

Source: Authors, from Smart PLS3 Output.

6. DISCUSSION

The empirical results of this study, derived from a structural analysis of 394 potential adopters, provide a nuanced understanding of how the Diffusion of Innovation theory operates within an emerging North African economy. While the model confirms the central roles of relative advantage, complexity, and triability, the rejection of compatibility and observability suggests that the Algerian consumer's transition to electromobility is governed by *pragmatic utility* rather than *socio-symbolic alignment*.

The overwhelming significance of perceived relative advantage ($\beta = 0.058$, $p < 0.05$) confirms that for Algerian consumers, the EV is first and foremost an economic and functional upgrade. This statistical finding underscores a pragmatic consumer orientation within the Algerian market, where the transition to electric mobility is largely perceived as a strategic opportunity for long-term fuel savings and operational efficiency, rather than solely an environmental choice. This result mirrors findings in other developing contexts where the “green” aspect of the vehicle is secondary to its “cost-saving” potential. As noted by Kim et al. (2018), when an innovation demonstrates a clear departure from the high maintenance and volatile fuel costs of internal combustion engines, the intention to adopt scales rapidly. Consequently, within the Algerian context, where the state is increasingly prioritizing energy efficiency, the 'relative advantage' of EVs is primarily defined by operational efficiency and a significant reduction in Total Cost of Ownership (TCO) compared to internal combustion vehicles. These economic benefits act as the key catalysts for market adoption.

However, this transition is tempered by perceived complexity ($\beta = -0.063$, $p < 0.05$). Our findings indicate that the “technological anxiety” associated with a radical shift in automotive architecture remains a significant barrier. The negative influence of perceived complexity indicates that the current technical opacity regarding charging protocols and energy management acts as a significant barrier for local drivers. These results suggest that the success of the national electrification strategy depends heavily on simplifying the user

experience and ensuring that sales consultants are equipped to educate consumers, thereby lowering the cognitive barrier to adoption. This aligns with the "ease of use" tenets of the Technology Acceptance Model (Davis, 1989), suggesting that the more intuitive the EV interface, the lower the resistance to adoption.

Crucially, the validation of perceived triability ($\beta = 0.054$, $p < 0.05$) identifies a vital "de-risking" mechanism and offers a vital insight into local adoption dynamics. As suggested by Arts et al. (2011), triability is the most effective tool for reducing the perceived risk inherent in high-cost technological investments. In a market where EVs are a novelty and still perceived as an unfamiliar "black box" innovation, our results demonstrate that the ability to physically experience the vehicle is not merely a preference but a prerequisite for adoption. This reinforces the necessity for Algerian automotive importers and retailers to move beyond static showrooms and prioritize mobile demonstration units or "rent-to-buy" schemes to demystify EV operation for potential adopters.

Conversely, this study reveals the statistical insignificance of perceived compatibility and Observability, which contradicts classic DOI expectations. The failure of compatibility ($\beta = 0.049$, $p > 0.05$) suggests a "functional decoupling" in the Algerian market. While previous studies often find that EVs must align with a consumer's pro-environmental lifestyle (Jansson, 2011), our results suggest that Algerian consumers are willing to overlook a lack of lifestyle "fit" if the economic benefits are high enough. This implies that adoption in Algeria is driven by necessity and efficiency rather than a desire for the vehicle to mirror one's personal values or past habits.

Similarly, the rejection of observability ($\beta = 0.059$, $p > 0.05$) indicates that EV adoption in Algeria is currently an individualistic, private evaluation rather than a social statement. While EVs are "future-oriented" symbols, their social visibility does not yet translate into peer-driven pressure. This aligns with Elena et al. (2020), who argue that in early-stage markets, pragmatic factors like reliability and infrastructure outweigh the "prestige" or "visibility" of the innovation. In short, the Algerian consumer is looking for a solution to their mobility needs, not a badge of social status.

7. CONCLUSION

This research sought to evaluate the applicability of the Diffusion of Innovation framework in predicting the adoption of electric vehicles within the emerging Algerian market. Our study serves as a foundational roadmap for the national transport sector, demonstrating that the transition to electromobility in Algeria is currently governed by a logic of pragmatic utility rather than social conformity. By establishing the empirical significance of relative advantage, complexity, and triability in this specific context, we move beyond mere theoretical validation to provide a comprehensive analysis of the local barriers to adoption. This work contributes to the academic discourse by demonstrating that consumer behavior in emerging economies can deviate from traditional DOI predictions – specifically regarding the roles of compatibility and observability – thereby highlighting the necessity of context-specific research when deploying sustainable technologies.

For automotive manufacturers and importers currently operating in the Algerian market, the validation of relative advantage affect necessitates a shift in marketing narratives. Advertising campaigns must transcend generic environmental slogans and focus on the "Total Cost of Ownership" (TCO). Highlighting the dramatic reduction in fuel expenditure and the lower maintenance requirements of EVs compared to internal

combustion engines will resonate more deeply with the Algerian consumer's economic priorities. Furthermore, emphasizing the superior driving experience can position the EV as a “premium” functional upgrade rather than just a “green” alternative.

To address perceived complexity influence, industry actors must behave as educators. The perceived technical opacity of EVs – concerning battery longevity and charging infrastructure – remains a significant psychological barrier. Strategic efforts should include the dissemination of simplified technical guides and the training of specialized sales consultants who can demystify the technology. Reducing anxiety is essential for moving the innovation from the niche “Innovator” phase to the “Early Majority”.

The significant influence of triability identifies a critical “de-risking” mechanism for high-involvement purchases. In a market where EVs are a novelty, traditional static showrooms are insufficient. Automotive retailers should implement widespread “test-drive” events and mobile demonstration units across different Algerian provinces. Moreover, the introduction of short-term leasing programs or “rent-to-buy” schemes could allow hesitant consumers to integrate the EV into their daily routines without the immediate burden of a full capital investment. This “learning by doing” approach is the most effective way to build the behavioral confidence necessary for a mass-market transition.

Environmental NGOs should pivot from general awareness to targeted advocacy. Given that observability was not a significant driver, these organizations must work to make the “invisible” benefits of EVs more tangible. This includes publishing independent studies on local urban air quality improvements and advocating for visible “EV-only” incentives. By validating the technology through third-party environmental audits, these organizations can act as the “opinion leaders” Rogers identifies as essential for social system validation.

While this study provides robust empirical evidence, it is not without limitations. By focusing exclusively on the DOI theory, this research may have overlooked deeper psychological constructs such as “perceived behavioural control” or “subjective norms” found in the Theory of Planned Behaviour (TPB) or the Unified Theory of Acceptance and Use of Technology (UTAUT). Future research should seek to integrate these models to create a more comprehensive “Hybrid Acceptance Framework” for emerging markets. Additionally, as the Algerian charging infrastructure matures, longitudinal studies will be required to determine if compatibility and observability – which were insignificant here – become more relevant once the EV is a common sight on national roads. Finally, exploring the impact of specific government subsidies on the perceived “Relative Advantage” could provide vital data for refining national energy policies.

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Nour ElHouda SETIFI¹
Sarrah LAMAMRA²
Ghada KHADICH³

THE IMPACT OF COMPETITIVE INTELLIGENCE ON THE ALGERIAN CONSUMER EXPERIENCE: A CASE STUDY OF L'OREAL

In today's environment, competitive intelligence is a vital strategic tool that enables organizations to make proactive and effective decisions, ensuring superiority over competitors. It equips firms with comprehensive knowledge of their competitive environment, thereby enhancing the consumer experience. This study investigates the impact of competitive intelligence on improving consumer experience across six dimensions – cognitive, emotional, physical, sensorial, relational, and functional – among Algerian consumers of L'Oréal products. Structural equation modeling was employed, using data from an online questionnaire distributed via social media and email, with a sample of 313 respondents. Analysis through Smart PLS V4 revealed that competitive intelligence significantly influences consumer experience, with the physical and functional dimensions most affected. This study fills a scientific gap in the Arab and African contexts by adopting a consumer-focused perspective and recommends emphasizing modern analytical tools to reinforce competitive intelligence and foster stronger consumer relationships.

Keywords: competitive intelligence, cognitive dimension, emotional dimension, physical dimension, sensorial dimension.

1. INTRODUCTION

Today, the consumer, especially in the era of the knowledge and information society, represents a turning point for organizations and large companies. The consumer has shifted from being a passive consumer to a well-informed one, and thus is capable of sharing his

¹ Nour ElHouda Setifi, University of Oum El Bouaghi, Algeria; e-mail: setifi.nourelhouda.univ.oeb@gmail.com (corresponding author). ORCID: 0000-0001-6742-2396.

² Sarrah Lamamra, University of Mila, Algeria; e-mail: s.lamamra@centre-univ-mila.dz. ORCID: 0009-0001-1687-666X.

³ Ghada Khadich, University of Oum El Bouaghi, Algeria; e-mail: khadich.ghada@gmail.com. ORCID: 0009-0001-0849-2797.

experiences related to a particular service or product with many consumers around the world. Accordingly, organizations today realize the importance of consumer opinions and work to meet their desires and requirements within the organizational process they implement in order to provide them with an exceptional experience (Patil, Rane, 2023). The success of organizations depends on their ability to generate purchasing decisions from consumers, which lies in their ability to accurately and fully meet the needs of their consumers (Dąbrowska, Janoś-Kresło, 2019).

It is well known in today's environment that different types of intelligence, including artificial intelligence, business intelligence, and competitive intelligence, all contribute to achieving agility for organizations (Rozman, Oreski, Crnogaj, Tominc, 2023), through their ability to collect and analyze information of various kinds, and then provide predictive insights and visions that are useful in making effective decisions that benefit both the organization and the consumer alike. The consumer benefits here from a distinctive experience with the organization's products or services. Competitive intelligence emerges as an important mechanism in meeting consumer needs and providing the best possible experience through the information and data it provides and the knowledge it builds about them, which enables improving the decision-making process to the greatest extent possible. Wright & Calof pointed out that the primary intention of competitive intelligence is the organization's sound understanding of itself, its customers, the laws, and its competitors (Fattouche, Hedjazi, 2019). In doing so, they explicitly emphasized the importance of competitive intelligence in understanding competitors, their desires, and their preferences, which allows the organization to provide products and services based on the knowledge it forms from the competitive context, and then offer the best customer experience. Holmlund et al. confirmed that the organization's formation of knowledge about its customers and environmental changes comes from monitoring, tracking, and evaluating consumer behavior, intentions, and visible trends across social media, through predictive big data analytics, including competitive intelligence (Holmlund et al., 2020).

Alshawawreh also pointed out the importance of competitive intelligence in its various dimensions in influencing the consumer experience, especially customer intelligence, as it helps in personalizing services according to consumer behavior in order to increase his loyalty and satisfaction (Alshawawreh, 2024). This means that competitive intelligence, through the information and data it collects and analyzes about consumer behaviors and preferences, enables the organization to make decisions and formulate effective strategies aimed at serving these preferences and needs, thus providing a unique experience for the consumer and influencing various sensory, cognitive, physical, and other aspects. Likewise, Fadlurrahman et al. emphasized the importance of competitive intelligence in improving the customer or consumer experience through possessing strong competitive attributes provided by competitive intelligence, which focuses on collecting information from various internal and external sources, expert evaluations, surveys, and social network analysis (Fadlurrahman, Riyanta, Ras, 2024). Roumani also studied the importance of competitive intelligence through social media in uncovering brand topics and predicting the level of consumer interaction, indicating that competitive intelligence helps through its algorithms to predict consumer interactions by analyzing their engagements on social media (Roumani, 2024).

From the previous studies, it can be observed that this literature clearly emphasizes the importance of competitive intelligence and its impact on the consumer experience, particularly from the perspective of predicting his interaction toward the organization's products or services. Some of these studies examined competitive intelligence and its

relationship with the consumer experience in general, attempting to study it as a tool for understanding competitors, customers, and the market. Other studies directed attention to it through social media, considering the latter a primary source for obtaining competitive intelligence information. Accordingly, it can be said that despite the efforts aimed at studying the relationship, previous literature overlooked the importance of other sources of competitive intelligence, in addition to not focusing on the consumer's perspective itself and the impact of competitive intelligence on his experience with the organization's products. This is what adds value to our current study, as it sheds light on the impact of competitive intelligence from the consumer's perspective on improving the consumer experience in its various cognitive, emotional, physical, sensorial, relational, and functional dimensions, not only in terms of understanding consumer behavior and interaction, but also in terms of how this tool, "competitive intelligence", affects the improvement of these aspects to provide a distinguished experience. On the other hand, it can be noted that there is little application of this type of study in Arab and African environments, which makes a case study of L'Oréal in a setting such as Algeria important for exploring the impact of L'Oréal's competitive intelligence on its consumers and the nature of their response, especially since the consumer experience has become one of the most important strategic dimensions that influence the success and superiority of organizations.

Based on what has been presented above, the central question of the study crystallizes as follows:

- Is there a statistically significant effect of competitive intelligence in improving the Algerian consumer experience from the perspective of L'Oréal's customers?

Since the ultimate goal of any organization is to achieve a distinctive consumer experience, organizations have focused on systematically applying the tools and principles of competitive intelligence, including "customer experience management," with the aim of enhancing consumer loyalty, which supports their competitive position and makes it difficult for competitors to imitate them. However, they must take into account several aspects that enable them to establish an appropriate framework for customer intelligence, the most important of which are the following (Dumitrscu et al.):

- Emphasizing consumer desires and needs: through making various improvements to the products and services offered. Consumer needs include everything from product development to strategies and social media;
- Emphasizing every unforgettable interaction: the organization is in continuous awareness of its consumers, and therefore it pays attention to any opinion or comment, and accordingly interacts and responds proactively;
- Integrating the consumer experience within the organization's culture: here, the organization's focus is on commitment and investment in providing an engaging consumer experience, involving everyone including employees, managers, and other stakeholders.

Accordingly, the organization's ability to capture knowledge about its consumers and build a database around them is important to adapt to the dynamics of the environment on the one hand, and also to improve the consumer experience. This enables it, on the other hand, to turn the threats it faces into opportunities that enhance its position (Chigozie, Amaogananya, Nnabugwu, 2024). It also helps in influencing the various aspects and dimensions of the consumer experience: cognitive, emotional, sensorial, physical, relational, as well as functional.

Based on the above, the main question of the study was divided into a set of sub-questions consistent with what was discussed above as follows:

- Is there a statistically significant effect of competitive intelligence on improving the cognitive dimension of the Algerian consumer experience from the perspective of L'Oréal's customers?
- Is there a statistically significant effect of competitive intelligence on improving the emotional dimension of the Algerian consumer experience from the perspective of L'Oréal's customers?
- Is there a statistically significant effect of competitive intelligence on improving the physical dimension of the Algerian consumer experience from the perspective of L'Oréal's customers?
- Is there a statistically significant effect of competitive intelligence on improving the sensorial dimension of the Algerian consumer experience from the perspective of L'Oréal's customers?
- Is there a statistically significant effect of competitive intelligence on improving the relational dimension of the Algerian consumer experience from the perspective of L'Oréal's customers?
- Is there a statistically significant effect of competitive intelligence on improving the functional dimension of the Algerian consumer experience from the perspective of L'Oréal's customers?

In light of the previous questions, we can build the study model which combines the independent variable "competitive intelligence" and the dependent variable "consumer experience" with its six dimensions. Figure 01 illustrates the conceptual model of the study:

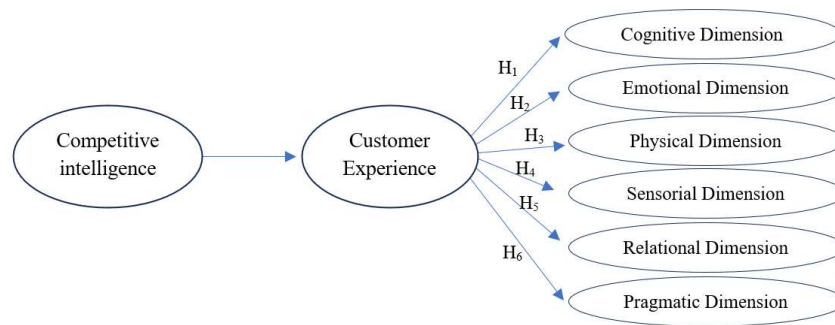


Figure 1. Conceptual Model

Source: Prepared by the researchers based on previous studies.

Figure 1 illustrates the study of the impact of competitive intelligence as an independent variable on the dependent variable "consumer experience" with its six dimensions, as shown in the figure, starting from the cognitive dimension and reaching the functional dimension. To test the effect, the study hypotheses were formulated as follows:

- H1: There is a statistically significant effect of competitive intelligence on improving the cognitive dimension of the Algerian consumer experience from the perspective of L'Oréal's customers;

- H2: There is a statistically significant effect of competitive intelligence on improving the emotional dimension of the Algerian consumer experience from the perspective of L'Oréal's customers;
- H3: There is a statistically significant effect of competitive intelligence on improving the physical dimension of the Algerian consumer experience from the perspective of L'Oréal's customers;
- H4: There is a statistically significant effect of competitive intelligence on improving the sensorial dimension of the Algerian consumer experience from the perspective of L'Oréal's customers;
- H5: There is a statistically significant effect of competitive intelligence on improving the relational dimension of the Algerian consumer experience from the perspective of L'Oréal's customers;
- H6: There is a statistically significant effect of competitive intelligence on improving the functional dimension of the Algerian consumer experience from the perspective of L'Oréal's customers.

1.1. Study Importance

In light of the increasing intensity of competition that we have witnessed recently among organizations, especially large ones, it has become more difficult to predict the movements and directions of competitors. This has made it harder to ensure customer loyalty to a particular brand, which requires these organizations to work on achieving alignment between their efforts and their innovative capacity. Our current study thus comes to highlight the importance of the topic of competitive intelligence by focusing on customer intelligence in studying the Algerian consumer experience of the L'Oréal brand within the framework of its competitive strategy.

1.2. Study Objectives

Through this study on the impact of competitive intelligence on the Algerian consumer experience, applied to the L'Oréal brand, we seek to provide a research contribution in the field of competitive intelligence on the one hand, and to present a vision to the managers of L'Oréal that the company has a wide segment of consumers who purchase its various products. This implies that the company can invest more in the Algerian market, work on expanding its marketing research further to achieve significant returns on the one hand, and to expand its market share on the other hand.

2. THE THEORETICAL FRAMEWORK

2.1. The Concept of Competitive Intelligence and Its Levels

Competitive intelligence dates back more than 5000 years, with the military strategist Sun Tzu considered one of the pioneers of this concept through his book *The Art of War*. Competitive intelligence refers to knowledge and anticipatory knowledge about the organization's environment as a whole, which entails a set of subsequent actions (Amiri, Shirkavand, Chalak, Rezaeei, 2017). Researchers such as Calof & Skinner (1999) and Lubicia & Masarova (2014) view competitive intelligence as the knowledge strategy adopted by the organization, revolving around the systematic process of planning, collecting, analyzing, and disseminating information about the organization's environment that may affect its competitive position, where analyzing and interpreting this information helps improve decision-making. Competitive Intelligence, through the analysis of

consumer data and behavior, helps organizations gain a deeper understanding of customer needs. Furthermore, it enhances marketing decision-making and strengthens organizations' competitive capabilities (Bartus, 2023; Qian, Chen, Shang, 2026). Roumani defines it as the continuous process of planning, collecting, analyzing, and disseminating information, which relates to competitors, customers, the market, and various factors of the competitive environment (Roumani, 2024).

Based on the definitions provided by researchers, it is clear that competitive intelligence revolves around the ongoing process of creatively gathering information about the organization's competitive environment, markets, customers, and competitors, and then analyzing and interpreting it, which allows the organization to make proactive competitive decisions, formulate effective competitive strategies, and strengthen its competitive capabilities.

Pirtimaki (2007) considers competitive intelligence as consisting of three levels that integrate and interact with each other to achieve an effective competitive intelligence system as follows:

- **Customer Intelligence:** Customer information, the nature of their behavior, and the factors that influence them constitute an important source for the organization to adopt and develop effective strategies directed toward consumer needs and desires, which enhances their satisfaction and loyalty toward the brand. Here, customer intelligence is considered an important tool in obtaining, analyzing, and interpreting this information to provide ready-made insights and visions on the basis of which effective decisions can be made. Customer intelligence refers to that type of intelligence that relies on collecting, analyzing, and interpreting customer information, their preferences and desires, behaviors, and the factors influencing them. Al-Hashem sees this intelligence as an innovative approach that enables the organization to achieve high profitability, gain more customers, and sustain relationships with its current customers, as it allows customers to become partners in the production process by taking into account all aspects that concern them and reflect their preferences (Al-Hashem, 2022);
- **Market Intelligence:** This type of intelligence focuses specifically on markets, concerned with collecting, analyzing, processing, and interpreting information about the organization's current, potential, and future markets, and working on identifying ways to succeed in them. Market intelligence also helps in understanding the current and future needs of these markets, along with identifying new segmentation opportunities (João, 2017).
- **Competitor Intelligence:** Competitor intelligence refers to the analytical process that transforms classified competitor information into accurate and usable strategic knowledge. It concerns the collection of information about competitors' current position, their performance across different times, their capabilities and intentions, information about their products and the technologies used, in addition to their economic, political, regulatory, and demographic impacts (Xu, Kaye, 2009). This means that competitor intelligence revolves around gathering information about competitors, especially their strategies, strengths, and weaknesses, which allows the organization to analyze their intentions and capabilities and exploit this in making effective decisions to outperform them.

2.2. The Consumer Experience and Its Dimensions

The consumer experience is of great importance, in addition to being a strategic approach to building competitive advantages for organizations, given the disruption in consumption patterns and environmental and social changes, etc. It represents an integrated series of events that provide a comfortable, enjoyable, and useful experience throughout the entire purchase life cycle; this experience may occur before purchase, during, or after purchase (Phamthi, Ho, 2024). Initially, interest in the consumer experience appeared in the entertainment sectors, later expanding to various fields such as health, inter-organizational markets, and even public services. Previous literature confirms that any point of interaction between the consumer and the service provider represents an opportunity to create an experience, whether positive or negative, influenced by several factors (Jaakola, Becker, Panina, 2022). This comes as a result of consumers' increasing interest in seeking brands that provide them with unique and thus unforgettable experiences, whether in terms of the value the brand delivers or the comfort and happiness they feel (Zarantonello, Schmitt, 2010). In this regard, Klaus & Maklan provide the most comprehensive definition, stating that consumer experience is "the consumer's cognitive and emotional assessment of his various direct and indirect encounters with the organization related to his purchasing behavior" (Scibor-Rylski, Reducha, Ochremiak, 2019).

The consumer experience is also defined as "the internal and subjective response that consumers feel as a result of indirect communication, through unplanned encounters with representations of the organization's services, products, or brand. Or direct communication, which occurs during the purchasing or usage process, or when receiving services, which is often initiated by the consumer" (Meyer, Schwager, 2007). Christian et al. explain that consumer experience is a fundamental axis in gaining and building consumer loyalty in addition to enhancing business performance, especially in increasingly competitive environments (Ultama et al., 2025). Thus, consumer experience is an administrative process of the strategy designed by the organization to continuously improve products, services, and methods of dealing with consumers, whether through intermediaries or directly through points of sale (Schmitt, 2003).

In most research and studies that examined the consumer experience, focus has been placed on five or six main dimensions. Measuring consumer experiences is very difficult in light of changes related to consumer desires and requirements; accordingly, interaction between the organization and the consumer opens communication channels between them. In this context, De Keyser et al. (2015), identified six dimensions for measuring consumer experience, namely: the cognitive dimension, the emotional dimension, the physical (material) dimension, the relational dimension, the sensorial dimension, and the functional dimension. These dimensions are used to measure consumer experience (Prakash, Padmakar, 2024).

The cognitive dimension refers to intellectual stimulation in addition to learning during the interaction process. The emotional dimension refers to the feelings, emotions, and moods experienced by the consumer during interaction with other consumers or with the brand. The physical dimension refers to the extent of the consumer's awareness of body movement and posture during the interaction process. The relational dimension refers to perceptions of relationships with someone else, whether other consumers, employees, or something like the brand, for example. The sensorial dimension refers to the sensory qualities of consumer interaction, which reflect the use of the five senses (Gahler, Klein,

Paul, 2023). Finally, the functional dimension is the desired dimension for consumers who value benefit and monetary value; they are not concerned with aesthetics, design, or even the social context in which the purchase takes place. Thus, sellers can encourage this experience by offering a different range of brands and products distinguished by quality and attractive prices, in addition to promotional offers (Cachero-Martínez, Vázquez-Casielles, 2017). The practical experience can also be affected by consumer feelings and emotions.

The consumer experience can be illustrated in the following figure through activities, value sources, and outcomes.

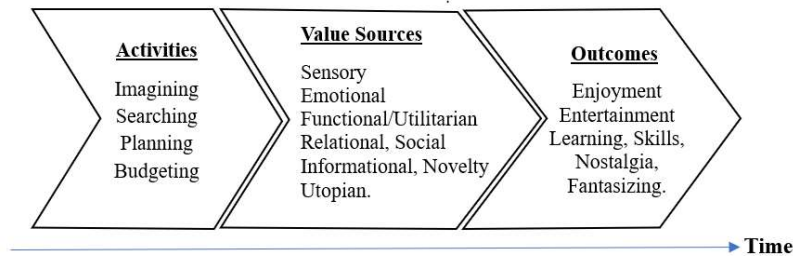


Figure 2. Customer Experience: Activities, Value Sources, Outcomes

Source: (Tynan, McKechnie, 2009).

Figure 2 illustrates the consumer experience with its three foundations: activities, value sources, and outcomes. It can be observed that the organization undertakes a set of activities that provide value to the consumer and his experience, where the most important of these activities are perception, research, planning, and budgeting in order to form a comprehensive picture of consumer preferences and inclinations, and to plan to deliver a clear value to the consumer. This value is manifested through several aspects, the most important of which are the emotional, sensorial, cognitive, physical, relational, and functional dimensions. As a result of these aspects, there are outcomes and results reflected in the achievement of consumer well-being and enjoyment, learning, skills, and other aspects.

3. METHODOLOGY

The study was prepared for the purpose of examining the impact of L'oreal's competitive intelligence on the consumer experience. To clarify the extent of Algerian consumers' interest in the company's product, which are distinguished by high quality and a variety of items serving different segments. To achieve this, structural equation modeling was applied using the partial least squares method (Smart-PLS) in its fourth version, which provide a comprehensive set of tools and metrics that allow exploring the relationship between competitive intelligence and the dimensions of consumer experience. The primary motivation for conducting this study stems from the clear lack of research addressing this topic within the Algerian research context, particularly in relation to the L'oreal brand. A review of the previous studies used as references for this research revealed no study investigating the same issue or even addressing a similar research perspective. This gap motivated the researchers to examine the impact of competitive intelligence on the behavior of Algerian consumers in the cosmetics industry.

Furthermore, this study seeks to enrich the existing body of knowledge by providing a scientific reference on this topic. It also offers empirical findings and practical recommendations that may benefit researchers, marketing professionals, and, in particular, L'oreal managers in supporting the expansion of the company's marketing activities, given its position as a global brand with a strong presence in numerous international markets.

To achieve the aforementioned objectives, a questionnaire was employed as the primary data collection instrument. Data were collected from a sample of 313 Algerian consumers and analyzed using Partial Least squares Structural Equation Modeling (PLS-SEM) with SmarPLS 4.

3.1. Questionnaire Design

The questionnaire tool was based on a three-point Likert scale (Agree = 3, Moderately Agree = 2, Disagree = 1), and it included a set of axes. The first axis was allocated to demographic data related to gender, age, educational level, personal income, and province of residence in Algeria. By defining these data, we aim to demonstrate the existence of a diverse market segment for L'Oréal that varies according to gender, educational level, income, and regions. The second axis was allocated to competitive intelligence, using the scale of (Al-Hashem, 2022), while for consumer experience, the scales of (Cachero-Martínez, Vázquez-Casielles, 2017; Gahler, Klein, Paul, 2023) were adopted.

As for the distribution of statements, six statements were allocated to competitive intelligence, and 22 statements to consumer experience distributed across its six dimensions as follows: Cognitive Dimension: 3 statements, Emotional Dimension: 4 statements, Sensorial Dimension: 4 statements, Physical (Bodily) Dimension: 4 statements, Pragmatic (Functional) Dimension: 4 statements, and Relational Dimension: 3 statements.

3.2. Study Population and Sample

The study population consisted of all Algerian consumers of the products of the French company L'Oréal. An electronic questionnaire was widely distributed through various social media platforms as well as via email to reach the largest possible sample, with the recommendation to share it with family, friends, and acquaintances to ensure its widespread circulation across various Algerian provinces. This enabled reaching a reasonable sample represented by 313 Algerian consumers.

3.3. Validity and Reliability of the Study Tool

The following table shows the validity and reliability of the study questionnaire based on Cronbach's Alpha coefficient:

Table 1. Validity and Reliability of the Study Tool

	Cronbach's Alpha	N of Items
Competitive Intelligence	0.815	6
Customer Experience (Six Dimensions)	0.931	22
Total	0.936	27

Source: Prepared by the researchers based on the outputs of SPSS V23.

From Table 1, it appears that the Cronbach's Alpha value for the variable "competitive intelligence" as well as for the variable "consumer experience" exceeds 0.7, which

indicates the validity and reliability of the statements used to measure them. Its value for the entire questionnaire reached 0.936, reflecting the validity and reliability of the study tool, which indicates its ability to examine the impact of competitive intelligence on the Algerian consumer experience.

3.4. Presentation and Analysis of Descriptive Statistics Results

This section concerns the presentation and analysis of the results of the study sample characteristics and the responses of the sample members to the study variables and their dimensions, based on frequencies, percentages, means, and standard deviations.

3.4.1. Presentation and Analysis of the Study Sample Characteristics

The most important characteristics of the study sample can be presented and explained through Table 2.

Table 2. Characteristics of the Study Sample

Variables	Frequencies	Percentages
Sex		
Female	253	80.80%
Male	60	19.20%
Age		
Less than 30 years	147	47%
From 30 to 40 years	111	35.50%
From 41 to 50 years	45	14.40%
51 years and above	10	3.20%
Type of products purchased by the consumer		
Skin care products	134	42.80%
Hair care products	129	41.20%
Beauty and makeup products	124	39.60%
Personal care products and perfumes	188	60.10%
Personal salary		
Less than 15,000	132	42.20%
Between 15,000 and 30,000	39	12.50%
Between 31,000 and 60,000	96	30.70%
More than 60,000	46	14.70%
Educational Level		
Secondary	23	7.30%
University	194	62%
Postgraduate	89	30.70%
Other	0	0%

Table 2 (cont.). Characteristics of the Study Sample

Variables	Frequencies	Percentages
Place of Residence (Wilaya)		
Adrar	1	0.30%
Chlef	1	0.30%
Lghouat	9	2.90%
Oum El Bouaghi	72	23%
Batna	7	2.20%
Biskra	3	1%
Béchar	3	1%
Bouira	2	0.60%
Tamanrasset	1	0.30%
Tebessa	11	3.50%
Tlemcen	4	1.30%
Tiaret	3	1%
Algiers	6	1.90%
Djelfa	2	0.60%
Jijel	4	1.30%
Sétif	9	2.90%
Skikda	89	28.40%
Annaba	5	1.60%
Guelma	4	1.30%
Constantine	22	7%
Médéa	1	0.30%
Mostaganem	1	0.30%
M'ssila	2	0.60%
Maskara	1	0.30%
Oran	9	2.90%
Bordj Bou Arreridj	1	0.30%
Boumerdés	3	1%
Taref	1	0.30%
Tissemsilt	3	1%
El Oued	1	0.30%
Khenchela	7	2.20%
Tipaza	2	0.60%
Mila	19	6.10%
Ain Defla	1	0.30%
Ain Témouchent	2	0.60%
Relizane	1	0.30%

Source: Prepared by the researchers based on the outputs of SPSS V23.

Table 2 shows the characteristics of the study sample, where we notice that the majority of respondents were female, representing 80.8%, while the rest were male. Most respondents had a university level of education, at 62%, followed by postgraduates at 30.7%. This is due to several reasons, the most important being that women are more

interested in cosmetic products and more concerned with the quality of hair and skin care products they use, unlike men who often do not pay much attention to the brand of the product used. Most of them were under 30 years of age, representing 47%, followed by the older age groups respectively. This can be explained by the fact that respondents under 30 are young men and women concerned with appearance and seeking branded products that achieve the desired goal. It is also observed that they mostly purchase personal care products and perfumes, representing 60.1%, followed by other types of products with close percentages.

Regarding personal income, the majority of respondents belonged to the category of less than 15,000 DZD, representing 42.2%, followed by the category of 31,000-60,000 DZD at 30.7%, then the categories above 60,000 DZD at 14.7%, and finally the category between 15,000-30,000 DZD at 12.5%. This can be explained by the fact that most respondents receive a monthly unemployment allowance which enables them to purchase these products, while the rest are employees in various sectors. As for the provinces of residence, the largest share of respondents came from Skikda Province, representing 28.4%, followed by Oum El Bouaghi Province at 23%. This is due to the strong response we received from sample members in these two provinces regarding the study topic, unlike other provinces from which we did not receive enough responses.

3.4.2. Analysis of the Sample Members' Responses on Study Variables

The table below illustrates the trends of the study sample's responses regarding the questionnaire's questions and dimensions.

Table 3. Trends of the Study Sample's Responses Regarding the Questionnaire's Questions and Dimensions

Code	Statement	N	Mean	Std. Deviation
CI1	You see that L'Oréal is concerned with collecting information about consumers to determine appropriate strategies.	313	2.46	0.624
CI2	You see that L'Oréal continuously collects information about consumer preferences.	313	2.41	0.66
CI3	You believe that L'Oréal develops new products based on consumer needs.	313	2.61	0.562
CI4	L'Oréal allows its consumers to participate in the production process.	313	1.94	0.74
CI5	You see that L'Oréal quickly responds to competitor activities and movements.	313	2.45	0.629
CI6	You see that L'Oréal applies many marketing strategies to outperform its competitors.	313	2.58	0.583
Competitive Intelligence		313	2.41	0.633
CE1	I realize that L'Oréal products deliver the result I want.	313	2.45	0.587
CE2	I understand the instructions for using L'Oréal products easily.	313	2.72	0.535
CE3	I realize that the materials used in L'Oréal products are safe.	313	2.43	0.611

Table 3 (cont.). Trends of the Study Sample's Responses Regarding the Questionnaire's Questions and Dimensions

Code	Statement	N	Mean	Std. Deviation
Cognitive Dimension		313	2.53	0.578
CE4	I repurchase L'Oréal products because of my positive experience with them.	313	2.64	0.554
CE5	I have positive attitudes toward L'Oréal products.	313	2.64	0.544
CE6	I see that the features of L'Oréal products create the motivation to purchase them.	313	2.54	0.598
CE7	I can rely on L'Oréal products because they are distinctive.	313	2.51	0.621
Emotional Dimension		313	2.58	0.58
CE8	I find that L'Oréal products have designs and colors that suit my taste.	313	2.53	0.555
CE9	I see that the packaging of L'Oréal suits the targeted groups.	313	2.6	0.547
CE10	The external appearance of L'Oréal products stimulates my purchase decision.	313	2.37	0.667
CE11	The way L'Oréal products are displayed encourages me to purchase them.	313	2.37	0.658
Sensorial Dimension		313	2.46	0.607
CE12	Using L'Oréal products makes me feel comfortable and confident.	313	2.47	0.604
CE13	My experience with L'Oréal products makes me distinguish them from other companies' products.	313	2.57	0.557
CE14	The design of L'Oréal products is distinctive in terms of shape and size.	313	2.51	0.567
CE15	I see that L'Oréal products do not cause any side effects during use.	313	2.38	0.66
Physical Dimension		313	2.48	0.597
CE16	I realize that the composition of L'Oréal delivers the result I want.	313	2.52	0.549
CE17	I realize that L'Oréal products are effective.	313	2.53	0.555
CE18	I find that L'Oréal products meet my new needs.	313	2.44	0.581
CE19	I find it easy to use L'Oréal products.	313	2.68	0.532
Pragmatic Dimension		313	2.54	0.554
CE20	I find that the positive experiences of my family and friends with L'Oréal products motivated me to purchase them.	313	2.48	0.665
CE21	I advise my close ones to buy L'Oréal products.	313	2.51	0.605
CE22	L'Oréal products provide effective results compared to their price.	313	2.41	0.644
Relational Dimension		313	2.47	0.638
N valid (list)		313	2.51	0.592

Source: Prepared by Researchers based on the outputs of SPSS V23.

Based on the table above, the following observations can be recorded: Firstly, respondents' answers regarding the "competitive intelligence" variable tended toward the "Agree" option, mostly exceeding 2.41, except for the statement CI4, which had a mean of 1.94 and thus belonged to the "Moderately Agree" option. As for the statements of the consumer experience variable dimensions (Cognitive Dimension; Emotional Dimension; Sensorial Dimension; Physical Dimension; Pragmatic Dimension; Relational Dimension), they tended toward the "Agree" option, with means exceeding 2.37.

This can be explained by the fact that the statement "L'Oréal allows its consumers to participate in the production process" was not sufficiently understood by respondents, so they leaned toward the "Moderately Agree" option. As for the other statements, they were unanimously agreed upon by respondents, considering that L'Oréal pays attention to developing its products to suit its customers' needs. Secondly, it is noted that the respondents' answers were not scattered but directed toward one option, as reflected by the small standard deviation values. This is due to the fact that most respondents were university students and postgraduates, making them well aware of the efforts made by the company to satisfy them.

4. STRUCTURAL EQUATION MODELING (SEM)

4.1. Convergent Validity

The table below shows the convergent validity of the study variables through Cronbach's Alpha, Composite Reliability, and Average Variance Extracted.

Table 4. Convergent Validity

	Cronbach's Alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)	VIF
CI	0.732	0.741	0.833	0.556	1.0000
Cogn.D	0.66	0.672	0.854	0.745	1.0000
Emot.D	0.874	0.874	0.913	0.725	1.0000
Sens.D	0.753	0.758	0.842	0.571	1.0000
Phys.D	0.742	0.743	0.838	0.564	1.0000
Prag.D	0.825	0.842	0.884	0.658	1.0000
Relat.D	0.677	0.705	0.859	0.754	1.0000

Source: SmartPLS Outputs.

The results in the table show that all the measures of convergent validity are achieved. The lowest Cronbach's Alpha value was estimated at 0.660, which corresponds to the *Cognitive Dimension*, while the highest value was estimated at 0.825, which corresponds to the *Pragmatic Dimension*. As for the Composite Reliability (rho_a) and Composite Reliability (rho_c) indicators, their values are also acceptable, as they exceed the required minimum threshold in all the dimensions of the study, indicating the reliability and validity of the questionnaire items and the dimensions representing each latent variable. This demonstrates the existence of good internal consistency.

Regarding the values of the Average Variance Extracted (AVE) indicator, they exceed 0.5, which indicates the convergent validity of the dimensions, and that more than 50% of the variance of the indicators is explained by the latent dimension. This is strong evidence of convergent validity.

As for the VIF value, it is observed that all equal 1.000, which indicates the absence of a multicollinearity problem, and that the study dimensions explain the phenomenon independently and without linear overlap with the other dimensions. This is an additional indicator of the strength of the study model.

4.2. Discriminant Validity

This section presents the discriminant validity of the study dimensions, where discriminant validity expresses the extent to which each dimension or latent variable is able to measure what it is supposed to measure and thus distinguish itself from the other dimensions in the model. Here, indicators such as cross loadings, the Fornell-Larcker criterion, and the HTMT test are relied upon.

4.2.1. Cross Loadings

Table 5. Cross Loading

	Cogn.D	CI	Emot.D	Phys.D	Prag.D	Relat.D	Sens.D
CE1	0.887	0.476	0.636	0.511	0.616	0.45	0.407
CE10	0.258	0.255	0.308	0.482	0.304	0.315	0.745
CE11	0.349	0.32	0.322	0.47	0.308	0.312	0.745
CE12	0.487	0.444	0.616	0.791	0.587	0.534	0.539
CE13	0.386	0.433	0.481	0.759	0.591	0.508	0.448
CE14	0.357	0.433	0.412	0.726	0.47	0.387	0.593
CE15	0.535	0.396	0.527	0.725	0.571	0.444	0.371
CE16	0.61	0.502	0.59	0.632	0.846	0.56	0.396
CE17	0.562	0.495	0.586	0.629	0.892	0.558	0.411
CE18	0.451	0.417	0.564	0.591	0.781	0.508	0.357
CE19	0.43	0.37	0.522	0.542	0.713	0.39	0.478
CE20	0.346	0.321	0.455	0.525	0.483	0.833	0.436
CE21	0.502	0.412	0.566	0.56	0.597	0.902	0.363
CE3	0.839	0.404	0.551	0.5	0.48	0.406	0.361
CE4	0.534	0.465	0.829	0.542	0.578	0.511	0.382
CE5	0.577	0.459	0.86	0.565	0.583	0.521	0.444
CE6	0.599	0.472	0.877	0.609	0.612	0.487	0.488
CE7	0.643	0.438	0.84	0.594	0.6	0.504	0.483
CE8	0.43	0.39	0.52	0.534	0.468	0.416	0.745
CE9	0.285	0.363	0.4	0.48	0.396	0.309	0.786
CI1	0.337	0.65	0.358	0.355	0.296	0.258	0.322
CI3	0.406	0.766	0.429	0.391	0.415	0.328	0.28
CI4	0.394	0.757	0.382	0.47	0.453	0.341	0.393
CI6	0.388	0.801	0.437	0.47	0.47	0.338	0.343

Source: SmartPLS Outputs.

The table shows the cross loadings of the study variables and their dimensions. According to Hair et al. (2019), the loading of an indicator on its own dimension must be higher and greater than its loading on other dimensions in order to indicate discriminant validity. As can be observed from the table, all indicator loadings on their own dimensions are higher than their loadings on the other dimensions, which confirms their discriminant validity. For example, we find that the loading of the indicator CE1 reached 0.887 on the cognitive dimension, which is higher than all its loadings on the other dimensions, and the same applies to the rest of the indicators, confirming that each indicator measures the targeted dimension in a distinctive way.

4.2.2. HTMT Test

The HTMT test compares the ratio of correlations between different constructs with the correlations within the same constructs, and it is also calculated to measure discriminant validity. The following table shows the results of the HTMT test.

Table 6. HTMT Test Results

	Cogn. D	CI	Emot. D	Phys. D	Prag. D	Relat.D	Sens. D
Cogn. D							
CI	0.692						
Emot.D	0.906	0.645					
Phys.D	0.841	0.715	0.843				
Prag.D	0.851	0.66	0.823	0.946			
Relat.D	0.727	0.566	0.764	0.879	0.825		
Sens.D	0.616	0.541	0.631	0.864	0.627	0.634	

Source: SmartPLS Outputs.

The value of this indicator must be less than 1, preferably less than 0.85, while it is still somewhat acceptable if it approaches 0.9. Looking at the values above, we find that most values were less than 0.85, which indicates discriminant validity of the dimensions, with some values exceeding 0.85, which indicates some convergence between the items of the cognitive and emotional dimensions together, as well as between the physical and functional dimensions. This is normal given the overlap of some aspects relating to products, as the physical aspect of the product may, in turn, be reflected in its functional aspect, making the similarity between these dimensions justified in this case, especially since the values do not exceed 1.

4.3. The Relationship Between the Study Variables

This section will clarify the relationship between the study variables based on the Fornell-Larcker criterion as well as the correlation matrix to demonstrate the strength and direction of the relationships.

4.3.1. Fornell-Larcker Standard

Table 7. Fornell-Larcker Standard

	Cogn.D	CI	Emot.D	Phys.D	Prag.D	Relat.D	Sens.D
Cogn.D	0.863						
CI	0.512	0.746					
Emot.D	0.69	0.539	0.852				
Phys.D	0.585	0.569	0.678	0.751			
Prag.D	0.64	0.554	0.697	0.739	0.811		
Relat.D	0.497	0.427	0.594	0.625	0.627	0.868	
Sens.D	0.446	0.449	0.527	0.653	0.5	0.453	0.756

Source: SmartPLS4.

The table above shows the relationship between the variables based on the Fornell-Larcker criterion to verify the discriminant validity of these variables, as indicated by the values highlighted in gray. All of them showed that the diagonal correlation values were higher than their correlations with other variables, which confirms their discriminant validity. For example, the diagonal value of competitive intelligence reached 0.746, which is greater than its highest correlation (0.569 with the physical dimension).

4.3.2. Correlation Matrix

Table 8 presents the correlation matrix of the study variables: the independent variable “competitive intelligence” and the dependent variables “cognitive dimension, emotional dimension, physical dimension, sensorial dimension, relational dimension, and pragmatic dimension.”

Table 8. Correlation Matrix

	Cogn.D	CI	Emot.D	Phys.D	Prag.D	Relat.D	Sens.D
Cogn.D	1.000	0.512	0.69	0.585	0.64	0.497	0.446
CI	0.512	1.000	0.539	0.569	0.554	0.427	0.449
Emot.D	0.69	0.539	1.000	0.678	0.697	0.594	0.527
Phys.D	0.585	0.569	0.678	1.000	0.739	0.625	0.653
Prag.D	0.64	0.554	0.697	0.739	1.000	0.627	0.5
Relat.D	0.497	0.427	0.594	0.625	0.627	1.000	0.453
Sens.D	0.446	0.449	0.527	0.653	0.5	0.453	1.000

Source : SmartPLS4 Outputs.

The correlation matrix shows the strength and direction of the relationships between the variables, which usually range between +1 and -1. From the table, a detailed reading of the relationships can be presented as follows:

- **Existence of relatively strong correlations:** These correlations are represented in the relationship between the emotional and pragmatic dimensions, which reached 0.697, as well as between the latter and the physical dimension, which reached 0.739.

In addition, the correlation between the physical and emotional dimensions reached 0.678. This indicates the interconnection of the dimensions and the influence of each dimension on the other, as the consumer's emotional aspect, in turn, affects the physical and pragmatic aspects of his experience with the company's products;

- **Existence of medium correlations:** These correlations relate to the relationship between competitive intelligence and the cognitive and physical dimensions, which reached 0.512 and 0.569 respectively. This means that L'Oréal's competitive intelligence affects these two dimensions more than the others. This is because this type of intelligence relies on the collection, analysis, and interpretation of knowledge, forming comprehensive knowledge for the organization about its environment and consumers, which in turn is reflected in the decisions taken that affect the cognitive and physical aspects of the consumer's experience with the company's products;
- **Existence of relatively weak correlations:** These relationships appeared especially between the cognitive and sensorial dimensions, where the correlation reached 0.446, as well as between competitive intelligence and the relational dimension, with a correlation of 0.427. This represents a point for investigation and inquiry, as competitive intelligence includes in its concerns the relationship between the organization and its consumers. This indicates a need to strengthen this aspect and use effective tools that serve competitive intelligence and enhance the organization's relationship with consumers, foremost among them the Customer Relationship Management (CRM) system, which constitutes one of the most important knowledge management systems. It interacts and collaborates effectively with competitive intelligence and provides it with sufficient consumer knowledge, which enhances the relationship between the two parties and directs it toward positive directions.

In general, the matrix showed the existence of positive relationships between the study variables, ranging from relatively weak to medium and strong, which supports the possibility of testing the study hypotheses due to the existence of significant relationships between the dimensions.

4.4. Results (SEM-PLS)

Figure 3 illustrates the results of structural equation modeling using SmartPLS in its fourth version, where in this section the most important results obtained will be analyzed and interpreted.

From the figure above, it is clear that the model is valid for estimating the relationship between competitive intelligence and the six dimensions of customer experience, based on what was proposed by Fornell and Larcker. This appears through the loading values, all of which were higher than 0.7 with only one value close to 0.7, after removing the items that affected the loadings and the quality of the results (Fornell, Larcker, 1981), which are CI2, CI5, CE2, and CE22. This indicates convergent validity and good representation of these items. The same applies to the structural model, where it is observed that the R^2 values are acceptable, indicating the validity of the model for the study. This can be further explained through the path coefficient values shown in the table below:

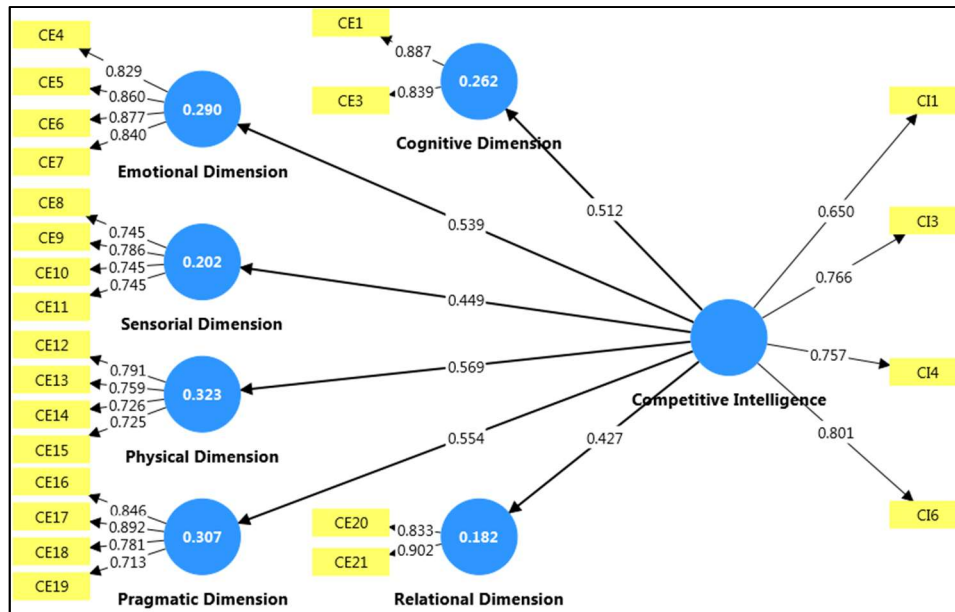


Figure 3. SEM-PLS

Source: SmartPLS4 Outputs.

Table 9. Path Coefficients

Latent Variables	Path Coefficients
Competitive Intelligence → Cognitive Dimension	0.512
Competitive Intelligence → Emotional Dimension	0.539
Competitive Intelligence → Sensorial Dimension	0.449
Competitive Intelligence → Physical Dimension	0.569
Competitive Intelligence → Pragmatic Dimension	0.554
Competitive Intelligence → Relational Dimension	0.427

Source: SmartPLS4 Outputs.

The results of the table above reflect the strength and direction of the relationship between competitive intelligence and each dimension of customer experience, as all of them were positive, which indicates a direct relationship between competitive intelligence and these dimensions. This means that the higher the level of competitive intelligence of L'Oréal, the more it contributes to enhancing customer experience in its various dimensions. It is also noted that the most affected dimension by competitive intelligence was the physical dimension (0.569), followed by the pragmatic dimension (0.554), then the emotional dimension (0.539). This means that enhancing competitive intelligence is clearly reflected in these dimensions, especially at L'Oréal, which offers tangible products whose effectiveness appears through their shape, design, and performance, and then the feelings generated in the consumer as a result of using these products, which, according to the company's consumers, constitute the most important aspects in the products they purchase.

Meanwhile, the other dimensions, namely the cognitive, sensorial, and relational dimensions, were the least affected by competitive intelligence, with path coefficients of 0.512, 0.449, and 0.427 respectively. This means that it contributes to a lesser extent in improving consumers' perception and understanding of the organization's products, which indicates the need for other strategies or factors to enhance this effect.

4.4.1. Coefficient of Determination (R^2)

The coefficient of determination reflects the percentage of variance in the dependent variable that can be explained by the independent variable. The higher its value, the more it indicates that the independent variable explains a large portion of the variance in the dependent variable. The following table shows the R^2 values of the study variables.

Table 10. Coefficient of Determination (R^2)

Latent Dependent Variables	R-square	R-square adjusted
Cognitive Dimension	0.262	0.26
Emotional Dimension	0.29	0.288
Physical Dimension	0.323	0.321
Pragmatic Dimension	0.307	0.305
Relational Dimension	0.182	0.18
Sensorial Dimension	0.202	0.199

Source: SmartPLS4 Outputs.

From the table above, we notice that most of the R^2 values are significant and statistically acceptable, ranging from weak to medium. The adjusted R^2 values are close to the R^2 values, indicating the quality and significance of the model.

4.4.2. Effect Size (F^2)

This section will clarify the effect size of the independent variable (competitive intelligence) on the six dimensions of customer experience.

Table 11. Effect Size (F^2)

	Cogn.D	CI	Emot.D	Phys.D	Prag.D	Relat.D	Sens.D
CI	0.355		0.409	0.478	0.444	0.223	0.253

Source: SmartPLS4 Outputs.

From the table above, it is clear that all effect size values were medium to strong. It is noted that the relational dimension was the least affected by competitive intelligence, with an effect size of 0.223, as well as the sensorial dimension, with an effect size of 0.253. It is also noted that the cognitive dimension was at the lower limit of strong effect size (0.35). As for the other dimensions, the effect size was strong (between 0.409 and 0.478), which indicates that competitive intelligence is a strong driver of these dimensions and therefore explains a very significant proportion of the changes in these dependent variables.

4.4.3. Predictive Relevance (Q^2)

The Q^2 predictive relevance indicator measures the quality of predicting the residual values, where the value of this indicator must be greater than zero to be suitable. The following table shows the Q^2 values of the study variables and dimensions.

Table 12. Q^2 Predictive Relevance Results

	Q^2 Predict	RMSE	MAE
Cognitive Dimension	0.246	0.874	0.709
Emotional Dimension	0.278	0.857	0.671
Physical Dimension	0.297	0.843	0.694
Pragmatic Dimension	0.287	0.85	0.706
Relational Dimension	0.17	0.918	0.761
Sensorial Dimension	0.177	0.914	0.757

Source: SmartPLS4 Outputs.

The table above presents the Q^2 predictive values along with RMSE and MAE error measures for each dimension of the model. It is noted that all Q^2 values of the model dimensions are positive, which indicates that the model enjoys good predictive power, where the physical and pragmatic dimensions had the highest accuracy with values exceeding 0.297, followed by the emotional and cognitive dimensions with medium predictive accuracy, while the predictive power of the relational and sensorial dimensions was less than the others. Nevertheless, they remain positive and within the statistically acceptable range.

As for the RMSE and MAE error measures, it is clear that they came within close ranges (0.67 and 0.91), where the lower the values, the higher the accuracy of the model. The physical and emotional dimensions recorded the lowest levels of error, which reinforces the accuracy of their prediction.

5. TESTING THE STUDY HYPOTHESES

In this section, the study hypotheses will be tested based on the indicators provided by the program, where Table 13 shows the results of testing the study hypotheses.

What can be observed from Table 13 is the following:

- Regarding the first sub-hypothesis: *There is a statistically significant effect at the significance level $\alpha \leq 0.05$ of competitive intelligence on improving the cognitive dimension of the Algerian consumer experience from the perspective of L'Oréal's customers* – there is an effect of competitive intelligence on improving the cognitive dimension estimated at (0.506), which is a positive effect. In addition, the p-value is equal to (0.000), which is less than 0.05, and the T-value estimated at (10.606) is greater than the minimum threshold of 1.96. Therefore, the first sub-hypothesis is supported.

Table 13. Direct Related Hypotheses Test

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Competitive Intelligence -> Cognitive Dimension	0.506	0.51	0.048	10.606	0.0000
Competitive Intelligence -> Emotional Dimension	0.538	0.54	0.05	10.717	0.0000
Competitive Intelligence -> Physical Dimension	0.556	0.56	0.042	13.11	0.0000
Competitive Intelligence -> Sensorial Dimension	0.434	0.44	0.048	8.962	0.0000
Competitive Intelligence -> Relational Dimension	0.424	0.429	0.049	8.708	0.0000
Competitive Intelligence -> Pragmatic Dimension	0.545	0.548	0.043	12.618	0.0000

Source: SmartPLS4 Outputs.

- Regarding the second sub-hypothesis: *There is a statistically significant effect at the significance level $\alpha \leq 0.05$ of competitive intelligence on improving the emotional dimension of the Algerian consumer experience from the perspective of L'Oréal's customers* – there is a positive effect of competitive intelligence on improving the emotional dimension estimated at (0.538). In addition, the p-value is equal to (0.000), i.e., it exceeded the statistical significance value of 0.05, and the T-value was estimated at (10.717), which is greater than the minimum threshold of 1.96. Therefore, the second sub-hypothesis is supported.
- Regarding the third sub-hypothesis: *There is a statistically significant effect at the significance level $\alpha \leq 0.05$ of competitive intelligence on improving the physical dimension of the Algerian consumer experience from the perspective of L'Oréal's customers* – there is a positive effect of competitive intelligence on improving the physical dimension estimated at (0.556). In addition, the p-value is equal to (0.000), which is less than 0.05, and the T-value estimated at (13.110) is greater than the minimum threshold of 1.96. Therefore, the third sub-hypothesis is supported.
- Regarding the fourth sub-hypothesis: *There is a statistically significant effect at the significance level $\alpha \leq 0.05$ of competitive intelligence on improving the sensorial dimension of the Algerian consumer experience from the perspective of L'Oréal's customers* – there is a positive effect of competitive intelligence on improving the sensorial dimension estimated at (0.434), which is weak but positive. In addition, the p-value is equal to (0.000), which is less than 0.05, and the T-value estimated at (8.962) is greater than the minimum threshold of 1.96. Therefore, the fourth sub-hypothesis is supported.
- Regarding the fifth sub-hypothesis: *There is a statistically significant effect at the significance level $\alpha \leq 0.05$ of competitive intelligence on improving the relational dimension of the Algerian consumer experience from the perspective of L'Oréal's customers* – there is an effect of competitive intelligence on improving the relational dimension estimated at (0.424), which is below average but positive. In addition, the p-value is equal to (0.000), which is less than 0.05, and the T-value estimated at

(8.708) is greater than the minimum threshold of 1.96. Therefore, the fifth sub-hypothesis is supported.

- Regarding the sixth sub-hypothesis: *There is a statistically significant effect at the significance level $\alpha \leq 0.05$ of competitive intelligence on improving the pragmatic dimension of the Algerian consumer experience from the perspective of L'Oréal's customers* – there is an effect of competitive intelligence on improving the pragmatic dimension estimated at (0.545), which is positive. In addition, the p-value is equal to (0.000), which is less than 0.05, and the T-value estimated at (12.618) is greater than the minimum threshold of 1.96. Therefore, the sixth sub-hypothesis is supported.

5.1. Results

Based on the analysis of the statistical results of both SmartPLS and SPSS, many important results have been achieved through this study. The most important of these results are summarized in the following points:

- The level of consumption of L'Oréal's products is high among both genders, male and female, with the majority being from the youth category and a bias in numbers toward females. This indicates that the company under study has a wide segment of consumers in the Algerian market, especially women, as they are the most concerned with appearance and caring for their elegance. In addition, they keep up with the company's new products through advertisements launched on social media. Moreover, the company's products are consumed in different regions, north and south, which explains that the company has an expansionary strategy.
- The majority of the study sample has a university-level education, which confirms that they have prior knowledge of the products produced by L'Oréal and therefore awareness of the extent of these products' impact on their health. They also have a monthly salary of more than thirty thousand Algerian dinars, which enables them to purchase and afford the company's products.
- The level of adoption of competitive intelligence at L'oreal, from the perspective of the Algerian consumer, was average. This confirms that L'oreal collects information about its customers in order to improve its products in line with their desires and level of aspirations on the one hand, and to work on expanding activity based on the information it collects on the other hand. The findings also indicate that L'oreal still has significant opportunities to expand its reach among Algerian consumers. Achieving this objective requires a deeper understanding and continuous analysis of the Algerian market. As a French multinational company, L'oreal has successfully penetrated international markets by leveraging intelligent technologies in its marketing activities, as highlighted by Roumani (2024). Furthermore, the company's extensive use of technology-particularly social media platforms and digital marketing-played a crucial role in increasing brand awareness and fostering a positive brand image among Algerian consumers. This reflects the importance of market intelligence, as emphasized by João (2017) and Qian et al (2026). The findings of the present study further underscore the importance of competitive intelligence, encompassing its three dimensions, in enhancing an organization's competitive advantage. In today's highly competitive business environment, where organizations strive to attract and retain customers, understanding markets, customers, and competitors has become a strategic necessity. The long-term success

and sustainability of consumer needs and deliver products and services that meet their expectations.

- It is also shown that the level of availability of the six dimensions of customer experience (cognitive, sensorial, relational, physical, pragmatic, emotional) is high from the perspective of the Algerian consumer. This indicates that the latter has knowledge and awareness about L'Oréal's products, which requires the company to take this information obtained seriously for the purpose of improving the products it offers.
- It was also found through the analysis that competitive intelligence has a clear impact on all dimensions of the Algerian consumer experience, with varying degrees reflecting the extent to which L'Oréal's Algerian consumers are influenced by its competitive intelligence. This, in turn, contributes to giving the company a comprehensive and integrated view of consumer requirements and orientations, which allows it to make effective proactive decisions that achieve customer satisfaction on the one hand and superiority over competitors on the other hand.

6. DISCUSSION

After conducting the analysis and clarifying the most important results reached by the study, it is clear that the current study is in agreement with most of the previous studies that addressed the relationship between the study variables. This study agrees with the studies of Wright & Calof, Alshawawreh, and Fadlurrahman, all of whom emphasized the importance of competitive intelligence in improving customer experience in its various aspects. This study came as a confirmation of that, showing that the most affected dimensions of customer experience by competitive intelligence are the physical dimension followed by the pragmatic dimension. The knowledge and information provided by competitive intelligence enable the organization to identify the aspects expected by the consumer from the organization's products, whether in their form, composition, effect, or function. Given that L'Oréal's products are tangible products expected by consumers to improve their care of their skin, hair, or body as a whole, the organization's focus here will be on the physical aspects that provide the consumer with comfort when using or purchasing the organization's products, in addition to paying attention to the product's functions and effectiveness in solving the problems that the consumer suffers from.

Studies such as Holmlund et al. (2020) and Roumani (2024) support the current study's results by confirming the importance of competitive intelligence in building comprehensive knowledge of the competitive environment and consumer orientations, which allows predicting their interactions and true opinions about the organization's products, and thus working on improving aspects that positively reflect on the consumer and their perception of the product. Accordingly, the current study confirms competitive intelligence as a strategic and essential tool in today's environment for organizations to achieve competitive superiority and distinction over their competitors through its facilitation of the processes of collecting, interpreting, and analyzing information, and developing new solutions and products based on the insights and visions provided by competitive intelligence tools. These tools are characterized as effective and advanced analytical tools through which the organization can understand the reality of its products and the behavior of its customers, enabling it to make effective proactive decisions and formulate competitive strategies capable of meeting consumer expectations and achieving them before competitors.

7. CONCLUSIONS

Targeting markets is considered among the most important expansion strategies that most companies or institutions seek to adopt, and L'Oréal is one of them, as we find its products in many countries around the world, and Algeria is among these countries. Accordingly, competitive intelligence is considered the most important strategic tool for penetrating markets, as it enables companies that adopt it to understand the desires and requirements of consumers through studying their constantly changing behaviors. This, in turn, improves their experience in consuming the products of those companies. Companies that rely on competitive intelligence through its three dimensions, represented in competitor intelligence by collecting information about them, consumer intelligence by sensing their tastes and desires, and market intelligence through analyzing the market and its trends, have the ability to enhance customer satisfaction and increase their loyalty, in addition to generating a distinctive and positive consumer experience.

8. STUDY LIMITATIONS

Based on the aforementioned results, we can propose some studies as future prospects, which can be a starting point for researchers interested in the same field, consisting of:

- Focusing more on conducting marketing research in order to analyze consumer behavior and understand their orientations and desires in addition to predicting them, which contributes to providing opportunities for companies to exploit in improving the consumer experience and thus enhancing their loyalty to its products.
- Focusing on developing products in line with the most sensitive and influential dimensions for the Algerian consumer, namely the physical and functional dimensions.
- The importance of focusing on the specialization of data science with the aim of improving the quality of service or product and thereby achieving consumer satisfaction. Here, we suggest that the company focus more on modern and advanced concepts in this field, such as business intelligence and data lakes, due to their effective analytical capabilities that can support L'Oréal's competitive intelligence and help in understanding and better meeting the requirements of its customers. This would enable it not only to build an effective competitive intelligence system but also to achieve strategic intelligence that addresses higher and more important strategic areas.
- Focusing on websites of various types through which companies can collect the largest amount of information from consumers' interactions with advertisements, promotional videos, and others.
- Focusing on the most prominent concepts that fall under competitive intelligence such as market intelligence, business intelligence, or consumer experience such as brand, customer relationship management, perceived justice, etc., given the importance of the consumer in the success of the company and their contribution to its continuity.
- Attempting to study the relationship in light of modern trends such as digital transformation, focusing on the importance of competitive intelligence in startups, and testing the relationship in the context of comparative studies between developing and developed markets.

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