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Resilience in the Import and Export Rulebook: How Customs Procedures Evolved Under COVID-19 Pressure – Evidence from Algeria

Belaaze Khayreddine – Bouneb Lotfi¹

Abstract

This study aimed to examine the adaptation of Algerian Customs' operational and regulatory framework during the COVID-19 pandemic. The research employed a qualitative case study approach, combining the analysis of official policy documents, customs administrative circulars, and operational data released by the Algerian Directorate General of Customs. The findings demonstrate that Algerian Customs successfully adopted a dual-strategy approach, effectively reconciling accelerated trade facilitation with robust enforcement. This adaptive response was crucial for sustaining the flow of critical supplies while safeguarding public health and economic security. The study concludes that the crisis served as a catalyst for procedural innovation, highlighting the importance of flexible, risk-based customs frameworks in building resilient supply chains during global disruptions.

Key words

Customs Administration, COVID-19 Pandemic, Supply Chain Resilience.

JEL Classification: F13; H12; L38

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Introduction

Customs procedures constitute the core of the customs process. They serve a dual purpose, facilitating the smooth flow of exports and imports on one hand, and ensuring compliance with the laws and regulations governing foreign trade on the other.

While national laws and business practices diverge, customs procedures are notably aligned and consistent. This harmonization is chiefly driven by the framework established by regional trade agreements; despite the variety of regional trade agreements, a customs union offers greater transparency and simplicity. This inherently reduces hidden administrative barriers, which are often manifested as customs complexities (Krueger, 1997). Chiumya (2009) argues that regional trade agreements underscore the renewed strategic importance of customs procedures, elevating them beyond mere administrative hurdles to foundational pillars for achieving economic integration. By managing rules of origin, facilitating trade flows, and ensuring regulatory compliance, these procedures play a decisive role in an agreement's success. Efficiently designed and implemented customs processes enhance economic gains by lowering transaction costs, streamlining operations,

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and converting preferential terms into real-world benefits. As a result, customs procedures are transforming from routine administrative functions into proactive instruments of trade policy and vital drivers of regional competitiveness in the global trading system (Chiumya, 2009).

The World Customs Organization (WCO) is the sole international body specializing in customs matters. It seeks to improve the effectiveness and efficiency of customs administrations worldwide by harmonizing and facilitating international procedures and standards—such as the Harmonized System and customs valuation.

The WCO develops key instruments and agreements, including the Revised Kyoto Convention and the SAFE Framework of Standards, to strike a balance between trade facilitation and security and compliance. Furthermore, it delivers technical support and capacity-building programs, particularly for developing member countries, assisting them in modernizing their customs systems, promoting integrity, and combating corruption. The organization also fosters cooperation among customs administrations, the private sector, and other international bodies, such as the World Trade Organization, to enhance coordination and security across global supply chains (Juárez Allende, 2022).

Following the declaration of the COVID-19 pandemic, profound repercussions began to manifest within the realm of international trade, with global supply chains experiencing acute disruption. Government-imposed lockdowns and mobility restrictions severely impeded the accessibility and movement of goods. Concurrently, a surge in demand for specific commodities, most notably essential medical and sanitary supplies, compounded these challenges and intensified the ensuing global economic crisis.

This resulted in reduced vessel and container throughput, prolonged waiting and turnaround times stemming from health protocols, workforce shortages, and supply chain disruptions. Additionally, warehousing, distribution, and hinterland connectivity operations were hampered by factory shutdowns and transport constraints (Mannan, Shaheen, & Saha, 2021).

Kerr (2020) analysed the impact of the COVID-19 pandemic on international agricultural trade relations. He argued that the crisis exposed the fragility of complex global supply chains and the high degree of dependence on foreign sources, particularly in essential sectors such as food and medical supplies. A surge of unilateral export controls emerged, notably targeting medical supplies and agricultural goods, while several nations concurrently enacted temporary tariff cuts on critical imports. In the long run, the crisis is likely to instigate a structural transformation in economic globalization by prompting states and corporations to re-evaluate, streamline, and diversify their supply chains (Gruszczynski, 2020).

Kazunobu Hayakawa and Hiroshi Mukunoki (2021) observed that the COVID-19 pandemic had a significantly negative impact on international trade overall, particularly during the first wave (March to May 2020). They noted that these adverse effects diminished over time and that the effects on both exporting and importing countries often became statistically insignificant from July 2020 onward, attributing this trend to economic adaptation and increased reliance on online shopping and remote work. The authors also highlighted sectoral heterogeneity, with negative effects persisting longer in labor-intensive industries and non-essential durable goods, while positive effects emerged for imports of medical products in some affected countries.

Liudmyla's study (2021) focused on the urgent need to introduce changes to the work of customs administrations as a result of the pandemic that damaged global supply chains.

It also highlighted the challenges faced by customs administrations during the COVID-19 crisis and their responses provide an opportunity to review both operational resilience to possible future crises and to improve the day-to-day operation of the customs administration, including reduction of the administrative burden.

The study by Derindag, Reha Yasar, Aslan, and Parmaksiz (2024) analysed the differential effects of the COVID-19 pandemic on export flows, with a specific focus on comparing conventional and simplified customs procedures. The authors confirmed that the Simplified Customs Procedure Declaration (SCPD), commonly used for cross-border e-commerce and micro-exports, demonstrated greater resilience to the negative shocks of the pandemic compared to the Conventional Customs Clearance Declaration.

During this critical period, the World Customs Organization underscored the imperative for customs administrations to maintain the facilitation of cross-border trade for all goods, extending beyond relief supplies. Key operational measures included (WCO, 2024):

- Enhancing Inter-Agency Coordination: Collaborating with other government bodies to streamline and accelerate the clearance process for humanitarian aid shipments.
- Establishing Clearance Priorities: Expediting the release of relief shipments by prioritizing consignments containing pre-identified essential items.
- Implementing Expedited Processing Protocols: Treating the clearance of relief goods as a top-priority matter within standard operating procedures.
- Simplifying Documentation Requirements: Allowing for the submission of simplified, provisional, or incomplete goods declarations to reduce administrative delays.
- Enabling Advanced Processing: Providing for the pre-arrival processing of declarations and the immediate release of goods upon arrival, minimizing dwell times.
- Applying Smart Risk Management: Conducting physical inspections of relief goods only when a comprehensive risk assessment indicates a high level of risk.
- Advocating for Fiscal Relief: Supporting or initiating measures to waive or suspend import duties and taxes on qualifying relief items.

As a result of this health crisis, countries worldwide began implementing and adapting customs procedures to facilitate the flow of essential goods while managing public health risks. In China, the General Administration of Customs rolled out policies on faster clearance, minimum-interference customs control, and acceleration of market access processes for imported agricultural products (WCO, 2024). In France, importers of sanitary and medical equipment were given exemptions from customs duty. The UK implemented temporary waivers of customs duties and import VAT for qualifying medical equipment (WCO, 2024).

The purpose of this publication is to analyse the measures implemented by Algerian customs authorities to bolster economic resilience and ensure the uninterrupted flow of goods through supply chains during challenging periods.

1 Methodology

This study employs a qualitative case study approach to examine the operational measures implemented by the customs administration in response to the COVID-19 pandemic. This section aims to systematically identify and analyse the initiatives designed to facilitate trade and individual access while maintaining critical health security protocols.

This section examines a range of exceptional measures implemented by customs authorities for economic operators, including exceptional provisions instituted specifically for

temporary customs clearance procedure for imports under the streamlined regime for COVID-19-related goods, including pharmaceuticals, medical devices, detection equipment, and associated spare parts. A comprehensive analysis was conducted on all customs procedures instituted during the period spanning from July 2020 to 2023.

2 Results and Discussion

2.1 The Simplified Customs Clearance Procedure

Eligibility for the simplified customs procedure was limited to specific goods essential to the pandemic response. These include pharmaceutical products, medical devices, detection equipment, and their associated accessories and spare parts. The official list of these items was determined by the Ministry of Health and subject to validation by the relevant scientific pandemic monitoring committee.

Tab. 1 Eligible goods for simplified customs clearance procedure

Products	PHARMACEUTICAL PRODUCTS	Medical Devices and Instruments
Harmonized System (HS) codes	Chapter 30	Chapter 90

Source: Algerian customs, 2020

This measure was intended to streamline the import of medical and pharmaceutical supplies to satisfy domestic needs. Despite Algeria's efforts before the COVID-19 pandemic to boost its production capacity, the table below details the trends in pharmaceutical imports and exports.

Tab. 2 Trends in Pharmaceutical Trade for Algeria in US billion dollars

Year	2020	2021	2022	2023	2024
Imports	1,785	1,904	1,584	1,846	1,894
Exports	0,002	0,003	0,002	0.006	0,024

Source: WTO, 2025

The table illustrates Algeria's marginal participation in the global pharmaceutical export market, attributable to a long-standing reliance on imports to compensate for domestic production shortfalls.

The authorized simplified declaration procedures take the following forms: Simplified declarations, Provisional declarations, and Anticipated declarations. Simplified, provisional, and anticipated declarations are initial declarations that must be regularized by supplementary (final) declarations.

2.2 Exemption from VAT and Customs Duties

The list of products used in the response to the Coronavirus (COVID-19) pandemic is established by the authorized services responsible for Health and those responsible for the Pharmaceutical Industry, and is validated by the Scientific Committee for Monitoring the Evolution of the Coronavirus Pandemic.

The products included on this list benefit from a temporary exemption from Value-Added Tax and Customs Duties, in accordance with Article 36 of the Supplementary Finance

Law for 2020, as amended and supplemented by Article 22 of the Supplementary Finance Law for 2021. This list includes: Pharmaceutical products, Medical devices, Detection equipment, Accessories and spare parts for this equipment, and Raw materials.

Tab. 3 COVID-19 related pharmaceutical products before Exemption from VAT and customs duties

Products		Diagnostic/laboratory reagents	Filtering facepieces (FFP) EN149	Disinfectants (retail)
Customs Number	Tariff	3822900000	6307909100	3808941910
Customs duties before Exemption		15 %	30 %	30 %
VAT Exemption	before	19 %	19 %	19 %

Source: Algerian customs, 2019

For example, in the case of protective face masks, exempting the product from customs duties and value-added tax reduced the cost to the consumer by 24.7 percent.

2.3 Exceptional Customs Clearance Procedure

With the onset of the pandemic, an urgent need emerged to import supplies that were crucial tools in combating the crisis. A key measure was implemented: exceptional customs clearance procedure for oxygen concentrators imported by private individuals. Upon entry into Algeria, a traveller may import one oxygen concentrator for personal or family use, provided it is devoid of any commercial character. Customs clearance is processed at the port of entry with exemption from all applicable duties and taxes.

2.4 Measures to Ensure Supply Chain Continuity

A revised list of products suspended from export was adopted as part of the measures aimed at ensuring the availability of necessary products in the domestic market during the COVID-19 pandemic crisis. The scope of the list covered items essential for the COVID-19 response, including protective face masks and disinfectants.

Conclusion

In response to the COVID-19 pandemic, Algerian Customs implemented a comprehensive and agile set of measures designed to expedite the importation of essential goods while maintaining regulatory integrity. These measures struck a compromise between trade liberalization and efficient risk management.

Within the Customs Information System, dedicated "green" circuits were specifically allocated for the import of medical supplies and relief items related to the fight against COVID-19. A streamlined and expedited customs clearance procedure was established for essential goods and medicines, minimizing administrative delays at the border for these time-sensitive commodities.

Customs maintained and strengthened its risk management and anti-fraud system to protect the supply chain. These coordinated measures demonstrate Algerian Customs' proactive and adaptive approach during the crisis. By creating fast-track logistical channels,

providing fiscal relief for humanitarian aid, and implementing a flexible compliance mechanism, Customs successfully facilitated the urgent flow of essential supplies while maintaining robust risk controls to safeguard national security and public health.

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The Role of Health Awareness in Mediating the Relationship between the Digital Presentation of Essential Oils and Consumers' Purchase Decision

Imane Ben Mohamed¹ – Randa Saadi² – Amira Abdelbaki³ – Ikram Boudebza⁴

Abstract

This study aims to examine the role of health awareness in mediating the relationship between digital presentation and consumers' purchase decision. To achieve this objective, an electronic questionnaire was developed and administered to all participants in the study sample. The descriptive analytical approach was adopted to clarify the impact and relationships among the study variables. SPSS was used to analyze the questionnaire data. The findings revealed that digital presentation, with all its combined dimensions, as well as the mediating variable of health awareness, has a positive and statistically significant effect on the purchase decision. Based on these results, several recommendations were proposed, the most important of which is the necessity to enhance the digital presentation strategy of essential oils by focusing on all its dimensions and integrating reliable health-related information into digital content, in order to strengthen its positive influence on consumers' purchase decisions of health-related products.

Key words

Digital Product Presentation; Essential Oils; Health Awareness; Consumer Purchase Decision.

JEL Classification: M31, D12, I12

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Introduction

In recent years, the world has witnessed rapid advancements in information and communication technologies, which have had a profound impact on various economic activities, particularly marketing activities. Digital presentation has become one of the fundamental pillars upon which organizations rely to promote their products and services.

This transformation has contributed to reshaping the relationship between organizations and consumers, as product presentation is no longer limited to mere product display, but now encompasses digital information, images, and content that reflect product characteristics and consumer value.

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Certain products, such as essential oils, require special consideration in their digital presentation and marketing due to their nature, multiple uses, and strong association with health-related aspects and lifestyle choices. Moreover, health awareness has emerged as a key concept in contemporary consumer behavior.

Based on the foregoing, the following research problem can be formulated: What is the role of health awareness in the relationship between the digital presentation of essential oils and consumers' purchase decisions?

Research Hypotheses

Main Hypothesis: Health awareness plays a mediating role in the relationship between the digital presentation of essential oils and consumers' purchase decisions.

H1: There is a statistically significant relationship at the significance level ($\alpha \leq 0.05$) between the dimensions of digital product presentation and the purchase decision of the Algerian consumer.

H2: There is a statistically significant effect at the significance level ($\alpha \leq 0.05$) of the dimensions of digital presentation on the purchase decision of the Algerian consumer.

H3: Health awareness makes a statistically significant contribution at the significance level ($\alpha \leq 0.05$) to mediating the relationship between the digital presentation of essential oils and consumers' purchase decisions.

I Theoretical Framework

1 Digital Presentation

With the rapid development of interactive technologies such as virtual reality (VR), augmented reality (AR), and real-time live streaming, multiple forms of product presentation have emerged within the online shopping environment (Zhang, 2023). Previous studies have demonstrated that providing accurate and detailed visual information about products reduces perceived risk in online shopping and assists consumers in making more informed decisions (Boardman & McCormick, 2019).

The main forms of digital product presentation include: Online Product Presentation Videos — audiovisual resources that help online consumers become familiar with products (Zhendong, Bingjia, & Zhang, 2022). Mental Imagery — a type of cognitive activity based on imagining a concept or relationship, receiving considerable attention as an important theory in consumer psychology. Storytelling — the narrative approach adopted by brands to enhance interaction and foster acceptance among their audiences. Colors and Design — color conveys meanings and can influence consumers' thoughts, emotions, and behaviors (Singh; Labrecque, Patrick, & Milne, 2013).

2 Purchase Decision

The purchase decision-making process is defined as the behavior or process through which a consumer acquires a specific product or service directly by paying its price to the seller in order to satisfy a current or future need or desire. This process goes through several stages, beginning with the emergence of a need and ending with its fulfillment (Karam, 2018).

Stages of the purchase decision-making process: (1) Problem Recognition — the consumer purchase process begins with recognizing a need. (2) Information Search — consumers rely on both internal and external information sources. (3) Evaluation of Alternatives — using information collected from various sources. (4) Purchase Decision — the consumer selects one product among available alternatives. (5) Post-Purchase Evaluation — consumers experience the product and assess whether it meets their expectations (Doubal & Ben Nafla).

3 Health Awareness

Health awareness refers to individuals’ ability to translate health-related knowledge, information, and practices acquired from various sources into behavioral patterns that form a healthy lifestyle framework (El Ghadim & Cheradi, 2021). It enables individuals to adopt a sound scientific perspective that helps them interpret health phenomena, identify the causes of diseases, and take preventive measures to avoid them (Al-Turjumi, Al-Harbi, & Al-Saadi, 2022).

II Empirical Framework

1 Research Methodology

Based on the nature of the study and the objectives it seeks to achieve, the descriptive–analytical approach was adopted. This approach relies on examining the phenomenon through a review of previous studies and published literature, followed by data collection using an electronic questionnaire specifically designed for this study.

2 Population and Sample of the Study

The study population consists of all individuals who are connected to the Internet and active users of social networking sites. An electronic questionnaire was designed and distributed across the most commonly used online platforms. A total of 351 valid questionnaires were collected and deemed suitable for statistical analysis.

Tab. 1 Sample Characteristics

Variable	Category	Frequency	Percentage (%)
Gender	Male	29	8.26
	Female	322	91.74
Age	20 years or less	9	2.56
	21–30 years	38	10.83
	31–40 years	275	78.34
	More than 41 years	29	8.27
Educational Level	Secondary	18	5.13
	University level	333	94.87
Digital Platforms Used	Facebook	160	45.58
	Instagram	153	43.58

	TikTok	38	10.82
Total		351	100

Source: Prepared by the researchers based on SPSS v.26 outputs

3 Research Instrument and Measurement Methods

The study relied on an electronic questionnaire consisting of two main sections. Section One covered personal information of respondents. Section Two comprised 29 closed-ended statements distributed across three dimensions: digital presentation (15 items), purchase decision (8 items), and health awareness (6 items). A five-point Likert scale was employed.

4 Reliability of the Research Instrument

To ensure the reliability of the research instrument, Cronbach's Alpha coefficient was calculated. The overall reliability coefficient reached 0.862, indicating a high level of internal consistency and reliability.

5 Descriptive Statistics of the Study Variables

Tab. 2 Means and Standard Deviations of Digital Presentation Dimensions, Purchase Decision, and Health Awareness

Dimensions	Mean	Standard Deviation	Response Level	Rank
Images	3.6496	0.97673	High	3
Videos	3.5318	0.85311	High	4
Colors and Design	3.5385	0.85877	High	4
Storytelling	4.0579	0.58943	High	1
Price Presentation	3.8110	0.97463	High	2
Overall Mean of Digital Product Presentation	3.7178	0.58581	High	1
Purchase Decision	3.3156	0.97463	Moderate	—
Health Awareness	3.5385	0.85877	High	—

Source: Prepared by the researchers based on SPSS v.26 outputs

III Discussion of Results

1 Testing the First Sub-Hypothesis

H1: There is a statistically significant relationship at the significance level ($\alpha \leq 0.05$) between the dimensions of digital product presentation and the purchase decision of the Algerian consumer.

Tab. 3 Correlation Matrix between the Dimensions of Digital Product Presentation and the Purchase Decision

Variables	Images	Videos	Colors & Design	Storytelling	Price Presentation	Purchase Decision
Images	1					
Videos	0.440**	1				
Colors & Design	0.516**	0.473**	1			
Storytelling	0.364**	0.160**	0.488**	1		
Price Presentation	0.415**	0.335**	0.060	0.041	1	
Purchase Decision	0.319**	0.162**	0.198**	0.122**	0.574**	1

Source: Prepared by the researchers based on SPSS v.26 outputs

Table 3 shows that all dimensions of digital product presentation exhibit positive and statistically significant correlations with the purchase decision. Price presentation recorded the strongest correlation ($r = 0.574$), followed by images ($r = 0.319$) and colors and design ($r = 0.198$). Videos ($r = 0.162$) and storytelling ($r = 0.122$) showed weak yet statistically significant correlations. The first sub-hypothesis is confirmed.

2 Testing the Second Sub-Hypothesis

H2: There is a statistically significant effect at the significance level ($\alpha \leq 0.05$) of the dimensions of digital product presentation on the purchase decision.

Tab. 4 Results of Multiple Regression Analysis

Independent Variables	Standardized β
Images	0.063
Videos	-0.172*
Colors & Design	0.201*
Storytelling	0.006
Price Presentation	0.582*

Source: Prepared by the researchers based on SPSS v.26 outputs

The regression model is statistically significant ($F = 40.898$, $\text{Sig} = 0.000$). The coefficient of determination ($R^2 = 0.371$) shows that 37.1% of the variance in purchase decision is explained by the independent variables. Price presentation emerged as the strongest predictor ($\beta = 0.497^*$), followed by colors and design ($\beta = 0.206^*$). The second sub-hypothesis is confirmed.

3 Testing the Third Sub-Hypothesis

H3: Health awareness has a statistically significant mediating effect ($\alpha \leq 0.05$) on the relationship between digital presentation and purchase decision.

Tab. 5 Health Awareness as a Mediator between Digital Product Presentation and Purchase Decision

Independent Variables	Model 1 β	Model 2 β	Model 3 β	Mediation Result
Images	0.063	–	0.081	No Mediation
Videos	-0.172*	–	-0.139	Partial Mediation
Colors & Design	0.201*	–	0.184*	Partial Mediation
Storytelling	0.006	–	-0.017	No Mediation
Price Presentation	0.582*	–	0.478*	Strong Partial Mediation
Health Awareness	–	–	0.137*	–

Source: Prepared by the researchers based on SPSS v.26 outputs

Health awareness partially mediates the relationship between the videos, colors & design, and price presentation dimensions and the purchase decision. It does not mediate the relationship involving images or storytelling. The third sub-hypothesis is confirmed.

Conclusion

This study examined the role of health awareness in mediating the relationship between digital presentation of essential oils and consumers' purchase decisions. The findings revealed that digital presentation has a positive and statistically significant effect on purchase decision, with price presentation being the strongest predictor. Storytelling ranked highest in consumer evaluation among the digital presentation dimensions. Health awareness was found to partially mediate the relationship between certain digital presentation dimensions and the purchase decision, enhancing the overall influence of digital presentation on Algerian consumers' purchasing behavior.

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Language as a Sales Tool: Trust and Customer Experience in AI Communication¹

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Abstract

This paper examines the role of language as a factor influencing trust, customer experience, and the marketing effectiveness of communication in an artificial intelligence environment. Chatbots are increasingly serving as the first point of contact between customers and brands, and the way they communicate influences both brand perception and conversion behaviour. The theoretical section draws on the intersection of linguistics and marketing and highlights the importance of linguistic quality in digital communication. The empirical section is based on a questionnaire survey (n = 411) and analyses selected linguistic dimensions of chatbots. The findings suggest a significant influence of language on trust and interaction evaluation, as well as differences among respondent groups. The results represent a partial output of long-term research supplemented by a graphical model of relationships within a broader research framework.

Key words

Chatbot, Trust, Digital Marketing

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Introduction

The rapid development of artificial intelligence is fundamentally transforming the way communication between customers and brands takes place. As Huang and Rust (2021) note, artificial intelligence is becoming an integral part of services and is changing the nature of customer interactions. Building on this, Lemon and Verhoef (2016) emphasize that every touchpoint along the customer journey shapes the overall customer experience. Chatbots and AI tools are thus increasingly becoming the first point of contact between the customer and the brand, thereby gaining strategic importance from the perspective of marketing, trust, and purchasing behaviour.

In the digital environment, trust plays a key role in customer decision-making. Gefen, Karahanna, and Straub (2003) highlight the importance of trust in the online environment, while McKnight, Choudhury, and Kacmar (2002) identify it as a fundamental prerequisite for successful electronic interaction. In this context, the language of communication is a

¹ The research has been elaborated within the project I-26-101-00 "Language as a Sales Tool: Modelling Trust and Effectiveness in AI-Driven Brand Communication" and A-25-106/3020-18 "Artificial intelligence: challenges for linguistics and marketing".

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significant determinant of trust, as it influences the perceived reliability and competence of the communicating entity.

The importance of language is also evident in the areas of customer experience and information processing. Bao and Chang (2014) point out that the form of communication influences initial perceptions even before the content itself is evaluated. In the case of chatbots, this effect is even more pronounced, as language serves as the primary channel of interaction.

As AI-based communication develops, so do the demands on the quality of interaction. Følstad and Brandtzaeg (2017) point out that users expect not only functional accuracy but also naturalness and fluency in communication. Language thus becomes one of the key elements in building trust in AI systems.

Another important aspect of AI communication is the use of anthropomorphic elements. Araujo (2018) demonstrates that elements of "humanity" in communication can influence perceptions of both the technological solution and the brand. Feine et al. (2019) systematize the social elements of chatbot communication and their impact on interaction.

From a marketing perspective, language is a significant tool that influences customer decision-making. Zhu et al. (2022) demonstrate that the nature of communication influences the acceptance of AI solutions and consumer behaviour. Language can thus act as a factor that promotes conversion, but also as a risk that leads to a loss of trust.

Despite the growing importance of this issue, the linguistic dimension of chatbot communication remains relatively under-researched, particularly in the context of Central Europe. The aim of this paper is therefore to analyse selected linguistic dimensions of chatbot communication and identify their impact on trust and the customer experience.

1 Methodology

This paper is designed as a combination of theoretical and empirical approaches, drawing on the interdisciplinary connection between linguistics and marketing. To conceptualize the issue under investigation, a model was developed (Fig. 1) that captures the complex relationships between language, marketing elements, and customer behaviour in an artificial intelligence environment. This model integrates multiple dimensions of digital communication, such as emotional elements, call-to-action mechanisms, multilingualism, product perception, and the use of linguistic strategies based on the concepts of logos, ethos, and pathos.

Data collection was conducted using a structured questionnaire designed to assess respondents' experiences with communicating via chatbots. The research sample consisted of 411 respondents, with 126 men and 285 women. Respondents were divided into four categories based on their level of education. Individual variables were rated on a Likert scale from 1 to 7.

The questionnaire captured eight linguistic dimensions: grammatical correctness, lexical richness, syntactic complexity, communicative coherence, pragmatic appropriateness, stylistic consistency, semantic accuracy, and the use of discourse markers.

H₁: We expect differences between men and women in their evaluation of the overall experience with chatbots and in their evaluation of the linguistic dimensions of chatbots.

H₂: We expect differences between groups based on educational attainment in their assessment of overall experiences with chatbots and in their assessment of the linguistic dimensions of chatbots.

Multivariate analysis of variance (MANOVA) was used as the primary analytical tool. Subsequently, univariate tests (ANOVA) were applied to identify specific differences in individual language dimensions. MANOVA was chosen because it allows for the simultaneous examination of multiple language dimensions, which together form a comprehensive picture of chatbot communication evaluation.

2 Results and Discussion

The results of the MANOVA analysis confirmed a statistically significant effect of gender on the combined profile of the assessed variables (Pillai's Trace = 0.057; $F(9, 401) = 2.713$; $p = 0.004$), indicating that men and women differ in their overall perception of chatbot communication.

At the univariate level, gender differences were evident primarily in four variables. Men rated their overall experience with chatbots higher ($M = 5.22$; $SD = 1.49$) than women ($M = 4.77$; $SD = 1.35$), and this difference was statistically significant ($F(1, 409) = 9.149$; $p = 0.003$; $\eta p^2 = 0.022$). Similarly, higher ratings by men were also observed for lexical richness ($M = 5.41$ vs. 5.13 ; $p = 0.047$), syntactic complexity ($M = 5.07$ vs. 4.52 ; $p < 0.001$), and the use of discourse markers ($M = 4.10$ vs. 3.70 ; $p = 0.020$).

The most pronounced difference between men and women is evident in syntactic complexity, where the gap between the groups is the widest. These results suggest that gender differences do not manifest themselves in basic linguistic dimensions, such as grammatical correctness or semantic precision, but rather in more complex and less explicit aspects of communication. Based on the results of the multivariate analysis, it can be concluded that Hypothesis H₁ was confirmed.

The analysis by education level did not reveal a statistically significant effect ($p = 0.700$), suggesting that the linguistic quality of chatbot communication is perceived relatively consistently across educational groups. Hypothesis H₂ was therefore not confirmed. This result is particularly interesting from the perspective of marketing segmentation, as it suggests that language, as a factor of trust, may have a more universal character than traditional sociodemographic variables.

From a broader interpretive perspective, these findings support the assumption that language is a key element of digital communication that influences not only the cognitive but also the emotional aspects of the customer experience. From a practical standpoint, these findings imply the need for systematic management of the linguistic quality of chatbot communication. Organizations should pay attention not only to the accuracy of responses but also to their stylistic and pragmatic quality.

Conclusion

This paper focused on analysing the linguistic dimension of chatbot communication as one of the key components of the broader concept of "Language as a Sales Tool." The goal was to identify the extent to which language influences customer perception and experience in an artificial intelligence environment.

The results of the empirical analysis confirmed that the linguistic quality of chatbot communication is not a neutral element of digital interaction, but an active factor that differentially influences customer perception. The demonstrated differences between men and women suggest that linguistic dimensions, particularly the more complex and stylistic ones, play a significant role in shaping the overall experience. Conversely, the absence of differences based on education points to the relatively universal nature of basic linguistic perception.

The contribution of this paper lies not only in identifying the relationships between linguistic dimensions and customer perception, but also in highlighting the need to integrate linguistic aspects into marketing decision-making. The language of chatbots should not be viewed as a secondary element of a technological solution, but as a strategic tool that can significantly influence the effectiveness of communication and, ultimately, the performance of the organization.

In terms of future research, it is necessary to expand the analysis to include additional dimensions of the conceptual model and to verify their interactions. Future research should focus primarily on experimentally verifying the impact of specific language strategies on customer behaviour, as well as on their implementation in real-world marketing conditions.

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Mapping the Research Landscape on Artificial Intelligence, Sustainability, and Business Productivity: A Structured Literature Review¹

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Abstract

Artificial intelligence, sustainability, and business productivity form an emerging and internally fragmented research intersection. This paper presents a structured literature review of 29 peer-reviewed publications indexed in Web of Science and Scopus, covering the period 2022–2025. Applying the first two stages of a four-stage content-analysis protocol, material collection and descriptive analysis, the review maps the formal characteristics of the identified literature: publication trends, document types, geographic distribution of affiliations, disciplinary categories, citation impact, and publication outlet quality. Results confirm that this is a recent research stream, with no publications predating 2022 and a sharp surge in 2025, that is multidisciplinary in character but anchored primarily in management and economics. A key structural finding is that developing countries remain systematically underrepresented in the evidence base despite distinct AI adoption conditions, establishing a clear and precisely documented gap in the available knowledge base that this mapping makes visible for future research.

Key words

artificial intelligence, sustainability, business productivity, structured literature review, bibliometric analysis

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Introduction

Artificial intelligence (AI) has become a prominent topic in business and policy debates, as organizations face simultaneous pressures to improve productivity and demonstrate sustainability performance through frameworks such as ESG and the SDGs. Research that simultaneously addresses AI, sustainability, and business productivity has grown rapidly since 2022, yet remains geographically concentrated, methodologically diverse, and insufficiently documented in terms of its formal structure (Bracarense et al., 2022). Consolidating this stream requires a structured and transparent approach to collecting, filtering, and characterizing the available literature before any substantive synthesis can be attempted.

¹ This paper is a part of research projects: VEGA No. 1/0689/23 Sustainable growth and the geopolitics of resilience in the context of crisis prevalence; Young teachers, researchers and doctoral students project No. I-26-111-00 "AICARE Index"- AI-Health Competitiveness and Readiness in Central Europe.

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This paper responds to that need by conducting a structured literature review of peer-reviewed papers indexed in Web of Science (WoS) and Scopus. The review follows Barbieri et al. (2017), building on the process model for content analysis described by Seuring and Gold (2012). No comparable bibliometric mapping of this precise intersection — AI, sustainability, and business productivity together — has been identified in the literature. The specific objective of this paper is to document the formal bibliographic characteristics of the identified literature through a descriptive analysis of publication trends, document types, geographic distribution of author affiliations, disciplinary category distributions, citation indicators, and journal-level quality metrics.

The central research question guiding this paper is: What are the formal bibliographic characteristics of peer-reviewed research at the intersection of artificial intelligence, sustainability, and business productivity, and what structural features — including temporal trends, geographic distribution, disciplinary coverage, and citation patterns — define this research stream?

The paper is structured as follows. Section 1 describes the methodology. Section 2 presents the descriptive results and discussion. The Conclusion summarizes the key findings and the contribution of this mapping exercise.

1 Methodology

The aim of this paper is to conduct a structured literature review focusing on the intersection of artificial intelligence, sustainability, and business productivity in the Web of Science and Scopus databases. WoS is one of the most reputable academic databases, maintained by Clarivate and known for its rigorous indexing standards and broad coverage of internationally recognized publishers (Toha, 2025). Scopus, maintained by Elsevier, complements WoS by offering strong coverage of business, management, and social science literature (Bracarense et al., 2022).

The article employs a structured literature review following Barbieri et al. (2017), who build on the process model for content analysis described by Seuring and Gold (2012). The review is structured into four stages: (1) material collection, (2) descriptive analysis, (3) category selection, and (4) material evaluation. This paper reports the first two stages in full. In addition, the bibliometrix® package for R (Aria and Cuccurullo, 2017) was used to process bibliographic data and produce quantitative indicators.

The terms "Artificial Intelligence", "Sustainability", and "Productivity" were chosen as keywords, combined using the Boolean operator AND. Searches were conducted on 3 December 2025. Because the combined query still returned a broad set of results in Scopus (1,185 records), the term "Productivity" was replaced with "Business Productivity", reducing results to 157 documents. After the initial retrieval, records were screened through a three-step process: database-level filters, abstract screening for topic relevance, and deduplication. The final sample comprised 29 unique peer-reviewed documents.

2 Results and Discussion

2.1 Study Selection and Screening

Table 1 presents the initial results when keywords were searched individually, illustrating the scale of the literature for each term and the rationale for combining them.

The individual keyword counts range from 282,101 to 752,674 per database, underscoring that none of the three terms is sufficiently specific on its own.

Tab. 1 Initial search results by individual keywords (WoS and Scopus)

	Keyword	WoS	Scopus
Topic	"Artificial Intelligence"	282 101	752 674
Topic	"Sustainability"	426 343	573 600
Topic	"Productivity"	486 192	629 334

Source: Own processing based on Web of Science and Scopus results.

Table 2 summarizes the full study selection process. In WoS, a research-areas filter removed 451 records from the initial 525. A WoS category filter then removed a further 18 records. A document-type filter removed 7 additional records. This produced 49 documents for abstract screening, of which 23 were retained. In Scopus, a subject-area filter removed 94 records from the 157-result refined query. A document-type filter removed a further 21 records, producing 42 documents for abstract screening, of which 11 were retained. After combining both sets and removing 5 cross-database duplicates, the final sample comprised 29 unique documents.

2.2 Publication Trends and Document Types

No publications in the final sample predate 2022, confirming that this research stream is relatively recent. The annual distribution shows a non-linear but overall upward pattern: one publication in 2022, five in 2023, four in 2024, and eighteen in 2025. The sharp surge in 2025 ($n = 18$) indicates rapidly intensifying scholarly attention. Regarding document types, the sample includes 23 articles, 2 review articles, and 4 book chapters.

2.3 Geographic Distribution of Author Affiliations

China accounts for the highest number of affiliated authors (5), followed by the United States, Spain, India, and England (4 each). A second cluster includes Russia, Jordan, Hungary, Germany, and Canada (2 each). The concentration of research activity in China and advanced Western economies — with virtually no representation from low-income developing countries — points to a structural asymmetry in who produces knowledge about AI and its effects.

2.4 WoS Category and Scopus Subject Area Distributions

The dominant WoS categories are Management (9) and Economics (9), followed by Business (6) and Regional and Urban Planning (5). The distribution points to a multidisciplinary character. The most represented Scopus subject area is Business, Management and Accounting (6), followed by Computer Science (3) and Economics, Econometrics and Finance (3). Both classification systems reflect a business- and economics-anchored multidisciplinary profile.

2.5 Citation Indicators

The citation distribution is highly concentrated: a small number of articles account for a disproportionate share of total citations. The most cited publication is Budhwar et al. (2023) with 349 total citations and 87.25 citations per year. Dauvergne (2022) ranks second

with 132 total citations and 26.40 per year. Normalized citation metrics highlight that some newer publications achieve strong annual visibility despite lower total citation counts.

2.6 Publication Outlets and Journal Quality Indicators

The sample is dispersed across outlets; most journals appear only once, indicating that no single venue has yet emerged as the canonical home for this research intersection. Only Sustainable Development (3 articles) and Technological Forecasting and Social Change (2 articles) contain multiple studies from the sample. A substantial proportion of publications appear in high-ranked journals, with particularly strong representation in journals such as Technological Forecasting and Social Change (JIF 13.3) and Technology in Society (JIF 12.5).

Conclusion

This study presents the results of a structured literature review of 29 peer-reviewed publications at the intersection of AI, sustainability, and business productivity, applying a transparent four-stage content-analysis protocol to map the formal bibliographic characteristics of this emerging research stream.

The descriptive findings establish three structural features of the field. First, the literature is strictly recent: no included publications predate 2022, and the annual volume shows a non-linear but overall upward pattern peaking sharply in 2025 ($n = 18$). Second, the field is multidisciplinary but gravitates towards management and economics, with output concentrated in high-quality journals. Third, the geographic distribution of author affiliations is heavily skewed towards China and advanced Western economies; developing-country perspectives are systematically absent despite the fact that AI adoption conditions in lower-income contexts differ substantially from those documented in the existing literature.

The primary contribution of this paper is to provide a transparent, replicable characterization of the evidence base on which subsequent synthesis must build. The most significant structural asymmetry — the near-complete absence of developing-country evidence — constitutes a research gap that requires new primary data collection.

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Algerian Consumers Behavior Towards Eco-Friendly Products

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Abstract

This study explores Algerian consumer behavior regarding environmentally friendly products. The research adopts a quantitative methodology, utilizing a questionnaire administered to a sample of 246 customers of the Bebem Natural brand, which specializes in eco-friendly diapers. The findings confirm that environmental labels play a significant role in influencing consumer behavior. Additionally, the results reveal a positive correlation between consumer attitudes toward environmentally friendly products and their trust in brands as well as their perception of brand image. The study further underscores the critical role of environmental label certification in shaping consumer preferences and purchase decisions. Moreover, it highlights that Algerian consumers are willing to pay a premium for environmentally friendly diapers, particularly those made from natural materials.

Key words

Consumer Behavior, Eco-friendly, Eco-Labels.

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Introduction

Today, changes towards environmental improvements are becoming more politically acceptable globally, especially in developed countries (Jin Zhao, 2021). Consumers' increasing concern about the negative environmental impacts of purchasing goods has become a precedent affecting their purchasing behavior (Taufique, 2014). For example, recently the young generation, as the potential largest consumption group, has increasingly gained attention in order to promote an environmentally friendly purchase (Song, 2019).

In this context, the production of environmentally friendly products has become more important and the demand for environmentally friendly products has increased rapidly (Smelcerovic, 2021). That's why companies need to start paying attention to eco-labels, green products, prices, places, promotions, and other variables, generally known as the green marketing mix (Nabilla Shafira, 2021). Lantos (2001) argues that if a company implements strategic environmental responsibility, it gains positive publicity and improves its corporate image, and receives other benefits like increased competitiveness and increased benefit to consumers including bolstering local economies (Carrión-Bósquez, 2024).

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Meanwhile, the worldwide environmental awareness has prompted the Algerian authorities to shift their activities into more eco-friendly ways (Jan, 2023). The "Eco-Jem" public system for the return and recovery of packaging waste was created by Executive Decree No. 04-199 of July 19, 2004. Despite the fact that eco-label initiatives in Algeria lag behind the situation in other countries (Djemai Sabrina, 2020), the choice of Algeria is an appropriate one for studying the integration of eco-labels for companies in a difficult economic situation.

In this context, Algerian companies have begun integrating eco-labels; however, they remain uncertain about Algerian consumers' behavior toward these eco-friendly products. So, it is important to ask: How does the attitude towards eco-friendly products impact Algerian consumer behaviour purchases?

Development of Study Hypotheses

Ecolabels on product packaging signify that it has environmentally friendly properties (Hartono, 2022), which allows companies to give trustworthy signals about their production processes (Cinelli, 2023). It is a way of granting consumers with trustworthy and readily available information about a product's environmental attributes (Sønderskov, 2011). However, information asymmetry exists between sellers and buyers, as consumers are unable to determine whether a manufacturing method is environmentally friendly solely based on the product's appearance, taste, and smell (Mariëtte van Amstel, 2008).

H1: Algerian consumers' attitude towards eco-friendly products has an impact on Credibility of product.

Since consumers regard eco-labels as an essential element of green brands, it can help boost the relevance of associations and further affect brand image (Huang, 2022). Schmidt et al. (2017) confirm that when eco-labeling is utilized correctly, it can expand brand knowledge and help shape brand image.

H2: Algerian consumers' attitude towards eco-friendly products has an impact on Brand Image.

Increased awareness enhances the purchase intention for eco-labeled products (Paul, 2023). According to Baumeister (2017), ecolabels can influence consumer behavior by promoting sustainable purchasing choices and motivating producers and service providers to raise environmental standards.

H3: Algerian consumers' attitude towards eco-friendly products has an impact on Intention to Purchase.

In recent years, consumers have placed great importance on environmental protection and sustainability (Ziyeh & Cinelli, 2023). Evidence of this value creation is the increasing number of consumers that are willing to pay more for eco-labeled products (Prieto-Sandoval, 2016).

H4: Algerian consumers' attitude towards eco-friendly products has an impact on willingness to pay a higher price.

1 Methodology

This study aims to explore the relationship between consumer attitudes towards eco-friendly products and their subsequent behavioral responses, including product credibility, brand image, purchase intention, and willingness to pay a premium. A survey questionnaire was distributed to Algerian consumers who purchase Bebem Natural baby diapers.

In this research, we opted for the quantitative method through the questionnaire survey to collect the necessary data for our study. The questionnaire consisted of three parts: Part 1 (Admissibility) explored the Algerian consumer's familiarity with eco-friendly products through three introductory questions. Part 2 (Consumer Behavior) is divided into five sub-sections using a Likert scale to gauge respondents' attitudes and perceptions. Part 3 (Respondent profiles) contained questions related to respondent information: gender, age, and education level.

To calculate the sample size, we used the surveymonkey.com website with an error margin of 6.8% and a confidence interval of 95%, resulting in a sample size estimation of 246. The results of the Cronbach's alpha test, with values between 0.8 and 0.9, confirm the reliability of the measurement scales used in this study.

2 Results and Discussion

2.1 Respondent Profiles

In terms of gender, the majority of respondents were women (61.0%), while men accounted for 39.0%. This may indicate that women, who are often the main purchasers of baby products, are more involved in this area. In terms of age, the majority of respondents are in the 25–34 age bracket (51.2%), followed by the 18–24 age group (22.8%). In terms of education, the majority of respondents have a high level of education, with 48.8% having higher education (Master, Doctorate) and 38.6% having post-secondary education.

2.2 Familiarity with "Eco-friendly", "Organic" and "Natural" Products

Tab. 1 Familiarity with "Eco-friendly product", "Organic" and "Natural" products

Question	Response mode	Frequency	Percentage
Are you familiar with "Eco-friendly product"	Yes	204	82.9%
	No	42	17.1%
Is it important to you that a product be?	Organic	47	19.1%
	Natural	139	56.5%
	Environmental	60	24.4%

Source: Output of the SPSS program.

The results show that the vast majority of respondents are familiar with "Eco-friendly", "Organic" and "Natural" products. Only a small fraction of respondents are unfamiliar with these types of products, indicating a strong general awareness. The results also show that 56.5% of respondents consider it important for a product to be natural, indicating a clear

preference for this characteristic. Some 24.4% attach importance to a product being environmentally friendly, while 19.1% value organic products.

2.3 The Importance of the Ecolabel on Products

Tab. 2 The importance of the Ecolabel on products for the Algerian consumer

	Frequency	Percentage
Yes	224	91.1%
No	22	8.9%
Total	246	100.0%

Source: Output of the SPSS program.

The results show a clear preference among respondents for eco-friendly products certified by an eco-label, with 91.1% of respondents indicating that it is important to them that an environmentally friendly product be certified in this way. This strong preference for eco-labels suggests that consumers attach great importance to official validation of the sustainability and environmental impact of products.

2.4 Hypothesis Testing

To test the hypotheses, multivariate regression analysis (MANOVA) was used. Wilks' Lambda analysis reveals significant results with a Wilks' Lambda value of 0.320 (Sig < 0.001), indicating statistically significant differences between the groups in terms of their attitudes.

Tab. 3 Tests of Between-Subjects Effects

Dependent Variables	R	R ²	R ² Adjusted	F	Sig
Credibility	0.633	0.401	0.353	8.375	<0.001
Brand Image	0.610	0.373	0.323	7.456	<0.001
Purchase Intention	0.692	0.480	0.439	11.588	<0.001
WTPM	0.581	0.338	0.285	6.387	<0.001

Source: Output of the SPSS program.

The results confirm all four hypotheses. The correlation index (R) of 0.633 and R² of 0.401 indicate that 40.1% of the variance in credibility can be explained by consumer attitude (H1 accepted). For brand image, R = 0.610 and R² = 0.373, indicating 37.3% of the variance explained (H2 accepted). Purchase intention shows the strongest relationship with R = 0.692 and R² = 0.480 (H3 accepted). Willingness to pay more shows R = 0.581 and R² = 0.338 (H4 accepted).

Conclusion

In today's consumer landscape, environmental concerns have become increasingly prominent, influencing purchasing decisions worldwide. Eco-labels serve as indicators of a product's environmental impact, providing consumers with valuable information to make

more sustainable choices. In Algeria, where environmental consciousness is rising, understanding the impact of eco-labels on consumer behavior is crucial for businesses operating in eco-friendly markets.

The findings of our study strongly support the significant impact of Algerian consumers' attitude towards eco-friendly products on the credibility, brand image, intention to purchase and the willingness to pay a premium for environmentally friendly products. These findings underscore the importance of eco-labels in influencing purchasing decisions and the willingness to pay more for eco-friendly products in Algeria, highlighting the need for businesses to prioritize eco-certification to meet the growing demand for sustainable products in the market.

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