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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, and converting preferential terms into real-world benefits. As a result, customs procedures

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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)

While 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 (Kerr, 2020), 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. This trend may amplify protectionist sentiments and diminish dependence on centralized production, potentially reconfiguring the international trade order toward increased regionalism or bilateralism, undermining the multilateral framework (Gruszczynski, 2020).

While Kazunobu Hayakawa and Hiroshi Mukunoki, 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. They explained 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 (Kazunobu & Hiroshi, 2021)

The Liudmyla's study 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 (including possible further waves of COVID-19) and to improve the day-to-day operation of the customs administration, including reduction of the administrative burden (Liudmyla, 2021).

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 (Derindag, Yasar, Aslan, & Parmaksiz, 2024).

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. It further advocated for the adoption of a harmonized and forward-looking strategy in collaboration with pertinent agencies to safeguard the uninterrupted and secure progression of international commerce. 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. Furthermore, coordinating inspections with other government agencies to perform simultaneous checks where feasible, thereby avoiding duplication and delays.
- Advocating for Fiscal Relief: Supporting or initiating measures to waive or suspend import duties and taxes on qualifying relief items to facilitate their swift and cost-effective delivery.

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 following the outbreak, the General Administration of Customs of China has rolled out policies and measures on faster clearance, minimum-interference Customs control, certification services, and

acceleration of market access process for imported agricultural products, among other, to help businesses resume operations and boost foreign trade growth, and all local Customs offices are mandated to set up exclusive counters and maintain 24/7 green lanes for

expedited processing. This ensures that critical imported items—including pharmaceuticals, disinfectants, protective suits, and treatment equipment—are cleared and released without delay (WCO, 2024).

in France, Importers of sanitary and medical equipment and supplies have been given exemptions from Customs duty, other countries such UK implemented two key facilitative measures: first, the temporary waiver of customs duties and import value-added tax (VAT) for qualifying medical equipment to reduce financial and logistical barriers; and second, the activation of a dedicated disaster relief clearance route at ports to prioritize and expedite the processing and release of pandemic-related goods, ensuring their rapid deployment where needed (WCO, 2024).

The purpose of the 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 authority for economic operators, these 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. Implementation of these measures was contingent upon the official pandemic status and operates within the existing regulatory framework for risk management and ex-post control.

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 and apparatus for physical or chemical analysis
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. It was noteworthy that 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; this is attributable to historical factors primarily a long-standing reliance on imports to compensate for domestic production shortfalls.

In order to avail of this measure, any operator approved or authorized by the competent services of the Ministry of Health—and engaged in foreign trade on a permanent or occasional basis—may benefit from simplified customs clearance procedures. This applies to entities legally empowered to submit customs declarations, either on their own behalf or on behalf of others, provided they have not been prohibited from accessing the customs information system.

In this instance, Algeria has implemented an additional measure to streamline the declaration process via the Authorized Economic Operator (AEO) program and the granting of a customs license.

Simplified customs clearance procedures are granted for all authorized customs regimes, without prejudice to the exclusions stipulated in specific provisions, for the importation of goods covered by the aforementioned executive decree.

The authorized simplified declaration procedures take the following forms:

- Simplified declarations
- Provisional declarations
- Anticipated declarations

Simplified, provisional, and anticipated declarations are initial declarations that must be regularized by supplementary (final) declarations, the supplementary declaration is considered to form, together with the initial declaration, a single and inseparable legal act, taking effect on the date of registration of the initial declaration.

Duties and taxes are regularized based on the taxable elements accepted or acknowledged in the final detailed declaration, in accordance with the provisions of the Customs Code.

First, for the simplified declaration is a submitted declaration accompanied by a commitment to regularize it through a supplementary (final) declaration. It facilitates the urgent or expedited customs clearance and release of imported goods, requiring only a subset of the statements normally exigible in a detailed declaration or of the requisite documents. This is permissible provided that these statements and documents are sufficient to identify the goods in question and to implement the requested customs procedure.

Then again, it permits the release of goods upon presentation of a commercial document or any other document accepted by the customs administration. Its regularization through the submission of a regulatory detailed declaration must be completed by the customs office handling the case within a one-month period.

Also, A provisional declaration, also termed an "incomplete declaration," is a detailed declaration submitted with the purpose of subsequently completing this declaration or producing the missing documents within a one-month period. Consequently, the quantitative elements of the provisional declaration are deemed to have been declared on an approximate or forecast basis.

Finally, an anticipated declaration is a detailed declaration filed prior to the arrival of the goods, enabling their immediate release upon arrival. The declaration must be regularized before the goods are released, a maximum period of one month prior to the arrival of the goods may be granted for the filing of an anticipated declaration. If the goods are not presented within this 30-day period, the anticipated declaration is automatically annulled and deemed as not having been submitted.

The anticipated declaration allows the operator, among other things, to obtain the documents essential for the customs clearance file and to secure the rapid release of its goods. For the customs services, the anticipated declaration provides the necessary information in advance of the goods' arrival, facilitating control, determination of the tax base, and risk management.

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 (COVID-19) Pandemic.

Indeed, 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, which benefits from this exemption, included:

- Pharmaceutical products,
- Medical devices,
- Detection equipment,
- Accessories and spare parts for this equipment,
- Raw materials.

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

Products	Diagnostic or laboratory reagents on a backing, prepared diagnostic or laboratory reagents	Filtering facepieces (FFP) according to EN149	Disinfectants, put up in forms or packings for retail sale
Customs Tariff Number	3822900000	6307909100	3808941910
customs duties before Exemption	15 %	30 %	30 %
VAT before Exemption	19 %	19 %	19 %

Source: Algerian customs, 2019

From table 3 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. To facilitate this process, a key measure was implemented, namely exceptional customs clearance procedure for oxygen concentrators imported by private individuals

For an oxygen concentrator imported by a traveller: 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 based on the aforementioned exceptional customs declaration procedure for oxygen concentrators imported by private individuals. This clearance is granted in lieu of the authorization typically issued by the Ministry of Pharmaceutical Industry and with exemption from all applicable duties and taxes.

For an oxygen concentrator shipped via ordinary freight, express courier, or postal parcel: An oxygen concentrator imported by a private individual is classified as personal effects intended for personal or family use and devoid of any commercial character.

2.4 Measures to ensure supply chain continuity

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 coronavirus (COVID-19) pandemic crisis and ensure supply chain continuity, The scope of the list covered items essential for the COVID-19 response, including: Protective face masks, 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; in order to help the national public health response, 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. This prioritization ensured the rapid processing of critical shipments.

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. To further accelerate the physical release of goods, Customs allowed declarants access to a simplified clearance process.

Customs maintained and strengthened its risk management and anti-fraud system to protect the supply chain. This included targeted controls and seizures of illicit goods such as counterfeit medical devices, narcotics, psychotropic substances, and smuggled kerosene, ensuring the safety and authenticity of imported supplies.

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. Simultaneously, the maintenance of robust risk controls safeguarded national security and public health from related illicit trade, striking a crucial balance between facilitation and enforcement.

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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, benefiting from the capabilities offered by digital media in terms of content diversity, ease of access, and expanded interaction with consumers.

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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Within this context, the study of consumer behavior in the digital environment has gained increasing importance, particularly with regard to purchase decision-making, which represents one of the most sensitive stages in the marketing process.

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, reflecting individuals' level of awareness regarding the importance of making healthy consumption choices in their daily lives.

The growing attention to digital presentation, purchase decision, and health awareness is closely linked to the ongoing transformations in digital marketing and the need to understand the broader context in which consumer decisions are formed within electronic markets.

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?

To support this research problem, a set of sub-questions is proposed:
-Is there a statistically significant effect of the digital presentation of essential oils on consumers' purchase decisions?
-Is there a statistically significant relationship between the digital presentation of essential oils and consumers' purchase decisions?
-How does health awareness contribute to 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.

Sub-Hypotheses:

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.*

Significance of the Study

The significance of this study stems from its focus on contemporary and interrelated variables, namely digital presentation as one of the most important modern marketing tools, purchase decision as the final outcome of consumer behavior, and health awareness, which has become increasingly influential in shaping consumer choices particularly with regard to natural products such as essential oils.

Integrating these variables contributes to a deeper understanding of how purchase decisions are formed within the digital environment and highlights the explanatory role of health awareness in enhancing or directing the impact of digital presentation on consumer behavior.

Objectives of the Study

The objectives of this study are as follows:

- To identify the concept of digital presentation and its various dimensions.
- To examine the nature of the relationship between digital presentation and consumers' purchase decisions.
- To test the extent to which digital presentation influences consumers' purchase decisions.
- To determine the contribution of health awareness in 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, p. 2)

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. Other research has shown that different visual presentation formats influence distinct areas of the brain during the decision-making process. (Boardman & McCormich, 2019, p. 5)

The main forms of digital product presentation can be identified as follows:

-Online Product Presentation Videos

Online product presentation videos are audiovisual resources that help online consumers become familiar with products. (Zhendog , Bingjia , & Zhang, 2022, p. 3)They are defined as audiovisual content designed to showcase product features and present them to consumers in a clear and engaging manner.

Product presentation videos can be categorized into: (Zhendog , Bingjia , & Zhang, 2022, p. 3)

Product Appearance Video: This type primarily focuses on visual attributes such as color, shape, size, and style.

Product Usage Video: This type mainly presents usage experience information, including demonstrations of product functions and the outcomes of its use.

-Mental Imagery

Mental imagery is a type of cognitive activity based on imagining a concept or relationship.

It reflects the process through which individuals mentally represent sensory or perceptual experiences such as thoughts, emotions, and memories during memory processing.

Mental imagery has received considerable attention as an important theory in consumer psychology. (Zhendog , Bingjia , & Zhang, 2022, p. 4)

Visual images are considered one of the most effective forms of visual content in enhancing consumer engagement with products and services. (Maude Poirier & all, 2024, p. 2)

-Storytelling

Storytelling refers to the narrative approach adopted by brands to enhance interaction and foster acceptance among their audiences.

This is achieved through the use of various types of stories, such as founder stories, brand origin stories, product stories, and customer stories. (Ali Mohamed Nada, 2023, p. 185)

- Colors and Design

Color is light carried on wavelengths that are absorbed by the eye and interpreted by the brain as colors. (Singh, p. 783) Colors convey meanings and can influence consumers' thoughts, emotions, and behaviors.

Numerous disciplines including neuroscience, psychophysics, visual perception, and biology have employed advanced techniques to gain deeper insights into the complexities of color perception. Nevertheless, research on color usage within the marketing field remains relatively limited. (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 or desire and ending with its fulfillment. (Karam, 2018, p. 225)

-Stages of the Purchase Decision-Making Process

Problem Recognition: The consumer purchase process begins with recognizing a need.

Success in attracting consumers depends on the marketer's ability to identify consumer needs and determine how to satisfy them effectively. (Khentar & Guelche, 2020, pp. 412-413)

Information Search: After identifying a need, the consumer begins searching for solutions to satisfy that need or solve the problem by seeking information. At this stage, consumers rely on both internal and external information sources.

The primary internal source is previous experience, if prior experience is insufficient or if changes occur in how the need can be satisfied, consumers turn to external sources of information.

The extent of information search depends on the value and importance of the product; for low-value or low-importance products, consumers tend to limit their search to past experience. (Khentar & Guelche, 2020, pp. 412-413)

Evaluation of Alternatives: This stage involves using information collected from various sources to evaluate available alternatives.

Several criteria are used in this evaluation, including product quality, price, brand reputation, and the influence of family, friends, and colleagues. As a result, consumers narrow down the set of alternatives.

After gathering information, alternatives are compared, evaluated, and ranked, leading consumers to assess their advantages and disadvantages. (Khentar & Guelche, 2020, pp. 412-413)

Purchase Decision: At this stage, the consumer selects one product among the available alternatives.

This decision is not always easy, as companies offer numerous incentives such as enhanced product features, coupons, gifts, and discounts.

Additionally, firms often assist consumers by explaining how to use the product, particularly in the case of technological products. (Doubal & Ben Nafla, p. 155)

Post-Purchase Evaluation: The true test of the decision-making process lies in whether consumers are satisfied with the chosen product after passing through all previous stages.

Post-purchase evaluation closes the decision-making loop and occurs when consumers experience the product or service and assess whether it meets or exceeds their expectations. (Doubal & Ben Nafla, p. 155)

3. Health Awareness

Health-related products are characterized by their positive impact on consumer health and their lack of contribution to disease development. (Muller-Perez & all, 2025, p. 2)

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, p. 278)

It represents an individual's awareness of oneself and surrounding health conditions, as well as the formation of a cognitive orientation toward public health. (Salman, 2010, p. 4)

Health awareness 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-Saa, 2022, p. 13)

-Importance of Health Awareness

-Health awareness is considered one of the key indicators used to measure the progress of nations and societies, as higher levels of health awareness reflect societal advancement.

-It is a major criterion employed by researchers to classify societies as developed or underdeveloped.

-This is because spreading health awareness increases individuals' utilization of health services, supports environmental cleanliness, and enhances knowledge of healthy habits and behaviors related to nutrition, personal hygiene, and overall health improvement. (Abdel Rahman, 2021, p. 283)

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.

The collected data were then analyzed in order to test the research hypotheses and to formulate the most important recommendations for the relevant stakeholders.

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 by the target population. A total of **351 valid questionnaires** were collected and deemed suitable for statistical analysis.

Table 1 Presents the main characteristics of the studied sample.

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	Less than secondary	0	0.00
	Secondary	18	5.13
	University level	333	94.87
Monthly Income (DZD)	Less than 10,000	38	10.83
	10,001–40,000	55	15.67
	40,001–70,000	56	15.95
	More than 70,000	202	57.55
Relationship with Essential Oil Products	No prior exposure or purchase	72	20.51
	Viewed or purchased once or twice	93	26.49
	Occasionally follows offers or purchases	161	45.86
	Regularly follows / highly interested or purchases	25	7.12
Digital Platforms Used	Facebook	160	45.58
	Instagram	153	43.58
	TikTok	38	10.82
	Others	0	0.00
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 to measure the study variables, drawing on the theoretical literature related to digital presentation and purchase decision, as well as reviewing measurement instruments used in previous studies.

The research instrument consisted of two main sections:

Section One: Personal Information of Respondents, which included the following variables: gender, age, educational level, monthly income, nature of the relationship with essential oil products, and the digital platforms used.

Section Two: This section comprised **29 closed-ended statements**, distributed across the following dimensions:

-Dimension One: Includes **15 items** focusing on the digital presentation of the product.

-Dimension Two: Includes **8 items** focusing on the purchase decision.

-Dimension Three: Includes **6 items** focusing on health awareness.

The researchers employed a **five-point Likert scale (5-point Likert Scale)** ranging from **1 to 5**, where **1** indicates *strongly disagree* and **5** indicates *strongly agree*.

The cell length of the scale was calculated by determining the range of the scale scores and the upper and lower limits of the categories ($5 - 1 = 4$), then dividing the result by the number of scale levels (5), yielding a correct cell length of **0.80**.

This value was subsequently added to the minimum value of the Likert scale (1), allowing for the classification of response levels.

Table 2 Presents the scale used in this study

Score	Mean Range	Percentage Range	Level
1	1.00 – 1.80	20% – 36%	Very Low
2	1.81 – < 2.60	37% – 52%	Low
3	2.61 – < 3.40	53% – 68%	Moderate
4	3.41 – < 4.20	69% – 84%	High
5	4.21 – 5.00	85% – 100%	Very High

Source: Prepared by the researchers

3. Reliability of the Research Instrument

To ensure the reliability of the research instrument (the questionnaire), **Cronbach's Alpha** coefficient was calculated.

According to the criterion proposed by Hair et al. (2010), the reliability coefficient is considered acceptable if its value is equal to or greater than **0.70**.

The results of the statistical analysis revealed that the overall reliability coefficient of the questionnaire was high, reaching **0.862**, which indicates that the research instrument possesses a high level of internal consistency and reliability.

4. Statistical Analysis Methods

The following statistical techniques were employed for data analysis:

-Cronbach’s Alpha: to assess the reliability and internal consistency of the research instrument.

-Multiple Regression Analysis: to examine the effect of each independent variable individually on the dependent variable.

-Independent Samples T-Test: to determine whether there are statistically significant differences between two independent groups.

-One-Way Analysis of Variance (One-Way ANOVA): to identify statistically significant differences among more than two independent groups.

-Hierarchical Regression Analysis: to test the causal relationships and mediating effects between the dimensions of the independent variable and the dependent variable.

5. Descriptive Statistics of the Study Variables

Table 3 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

The table indicates that the overall mean of digital product presentation was high (**3.7178**), reflecting a positive consumer evaluation of the added value provided by digital elements in the promotional process.

-Storytelling ranked first with a mean of **4.0579**, highlighting the strength of this dimension in creating an emotional connection with consumers and conveying a marketing message that extends beyond the mere physical presentation of the product.

-Price presentation came second with a mean of **3.8110**, indicating that Algerian consumers are highly sensitive to financial aspects, which serve as a key determinant in their purchase decisions.

-The other visual dimensions showed relatively close rankings.

-Images occupied the third rank followed by *colors* and design and *videos*, all rated at a high level. This underscores the role of aesthetic and creative elements in enhancing product attractiveness and capturing consumer interest, as these features help draw attention and simplify the perception of product characteristics.

-Regarding *health awareness* the mean score was **3.5385**, falling within the high range. This indicates that the sample members demonstrate a good understanding of healthy practices and show a strong concern for health-related factors in their daily lives.

III. Discussion of Results in Light of the Research Hypotheses

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.*

Before proceeding with testing this hypothesis, it is important to note that the table presented below examines the statistical significance of the correlation coefficients by comparing the calculated *t-value* with the tabulated *t-value*, without explicitly reporting these values.

The presence of the symbol (**) next to the correlation coefficient indicates that the calculated *t-value* exceeds the tabulated value, confirming the statistical significance of the correlation.

The strength of the correlation coefficient is interpreted according to the following criteria:

-Weak correlation: if the correlation coefficient ranges between **0.10 and 0.30**.

-Moderate correlation: if the correlation coefficient ranges between **0.31 and 0.50**.

-Strong correlation: if the correlation coefficient ranges between **0.51 and 1.00**.

Table 4 Correlation Matrix between the Dimensions of Digital Product Presentation and the Purchase Decision of the Algerian Consumer

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 (04) shows that all dimensions of digital product presentation exhibit **positive and statistically significant correlations** with the purchase decision, although the strength of these relationships varies across dimensions.

-Price presentation recorded the strongest correlation with the purchase decision ($r = 0.574$), indicating that price transparency and clear price display within the digital presentation play a major role in enhancing the Algerian consumer's purchase decision.

-This is followed by **images** ($r = 0.319$) and **colors and design** ($r = 0.198$), which demonstrated positive correlations ranging from moderate to weak. This suggests that visual elements contribute meaningfully to shaping consumers' perceptions and attracting their attention, albeit to a lesser extent than price-related factors.

-Videos ($r = 0.162$) and **storytelling** ($r = 0.122$) showed weak yet statistically significant correlations with the purchase decision. This reflects that, within the studied sample, these interactive and narrative tools still have a limited influence on consumers' purchasing behavior.

Based on these findings, the **first sub-hypothesis is confirmed**, as there exists 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.

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 of the Algerian consumer.*

To test this hypothesis, **multiple regression analysis** was employed to examine the effect of each dimension of digital product presentation on the purchase decision. The results are presented in the table below.

Table 5 Results of Multiple Regression Analysis Testing the Effect of Digital Product Presentation Dimensions on the Purchase Decision of the Algerian Consumer

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 results indicate that the **regression model as a whole is statistically significant** at the significance level (**Sig = 0.000**), with an F-value of 40.898. This confirms the model's ability to explain the purchase decision.

The **coefficient of determination ($R^2 = 0.371$)** shows that 37.1% of the variance in the purchase decision can be explained by the independent variables, while the remaining percentage is attributed to factors not addressed in this study.

The **multiple correlation coefficient ($R = 0.610$)** indicates a relatively strong relationship between the dimensions of digital product presentation and the purchase decision.

At the level of individual independent variables:

-Price presentation emerged as the strongest predictor ($\beta = 0.497^*$) reflecting the central role of price transparency in shaping the purchase decisions of Algerian consumers. **-Colors and design** ($\beta = 0.206^*$) and **images** ($\beta = 0.170$) also showed positive effects confirming the importance of visual and aesthetic aspects in supporting purchase intentions. **-Videos** had a weak but statistically significant positive effect ($\beta = 0.145^*$) indicating a secondary role compared to the previous dimensions. **-Storytelling** ($\beta = 0.010$) did not have a significant effect suggesting that Algerian consumers still exhibit lower engagement with this marketing technique.

Overall, there is a **statistically significant effect at $\alpha \leq 0.05$** of the dimensions of digital product presentation on the purchase decision of Algerian consumers.

These results **support the second sub-hypothesis**, confirming that digital product presentation dimensions significantly influence consumer purchase behavior.

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 of essential oils and the purchase decision of consumers.*

To address this question, **Hierarchical Regression Analysis** was employed to examine the influence of the independent variable (digital product presentation) on the dependent variable (purchase decision) by introducing variables stepwise, while testing the mediating role of the health awareness variable in this relationship.

Table (06): Health Awareness as a Mediator between the Dimensions of Digital Product Presentation and the 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

Based on the data presented in **Table (06)**, the following observations can be made regarding the mediating role of **health awareness** in the relationship between digital product presentation and the purchase decision:

Model 1:

The results of the regression analysis indicate that the model is statistically significant ($F = 40.898$, $\alpha \leq 0.05$), demonstrating that the individual dimensions of digital product presentation (images, videos, colors & design, storytelling, and price presentation) have a statistically significant effect on the purchase decision of Algerian consumers.

Model 2:

This model examines the effect of the combined dimensions of digital product presentation on the mediating variable, **health awareness**.

The regression analysis shows that the model as a whole is statistically significant ($F = 54.633$, $Sig = 0.000 < 0.05$), indicating a meaningful effect of the digital presentation dimensions on consumers' health awareness.

Model 3:

After including all study variables, the regression results reveal that the overall model is statistically significant ($F = 35.531$, $Sig = 0.000 < 0.05$).

This confirms that the combined dimensions of digital product presentation, along with the mediating variable **health awareness**, have a positive and statistically significant effect on the purchase decision.

*These results indicate that **health awareness partially mediates the relationship** between certain dimensions of digital product presentation (videos, colors & design, and price presentation) and the purchase decision, enhancing the overall influence of the digital presentation on Algerian consumers' purchasing behavior*

The analysis further reveals that:

-*Health awareness partially mediates* the relationship between *the videos* dimension and the dependent variable *purchase decision* as the direct effect of videos decreased from (-0.145*) to (-0.108*) while the relationship remained statistically significant at $\alpha < 0.05$.

-*Health awareness partially mediates* the relationship between the *colors & design* dimension and *the purchase decision* as the direct effect decreased from 0.206* to 0.195* and the relationship remained statistically significant at $\alpha < 0.05$.

-*Health awareness partially mediates* the relationship between *the price presentation* dimension and *the purchase decision* as the direct effect decreased from 0.497* to 0.416* while the relationship remained statistically significant at $\alpha < 0.05$.

-*Health awareness does not mediate* the relationship between *the images* dimension and *the purchase decision* because the direct effect was not statistically significant ($\alpha \geq 0.05$) and remained non-significant after including the mediator.

-*Health awareness does not mediate* the relationship between *the storytelling* dimension and *the purchase decision* as the direct effect was not statistically significant ($\alpha \geq 0.05$) and remained non-significant after including the mediator.

Results

-The overall mean of digital product presentation was 3.7178, falling within the high range, which reflects a positive consumer evaluation of the added value provided by digital elements in the promotional process.

-Storytelling ranked first among the digital presentation dimensions with a mean of 4.0579, followed by price presentation with a mean of 3.8110. The other visual dimensions showed relatively close rankings: images ranked third, followed by colors and design and videos, all rated as high.

-Correlation analysis revealed that price presentation had the strongest positive relationship with purchase decision ($r = 0.574$), followed by colors and design ($r = 0.319$) and images ($r = 0.198$), indicating moderate to weak positive correlations. Videos ($r = 0.162$) and storytelling ($r = 0.122$) exhibited weak yet significant correlations.

-The results indicated a statistically significant relationship between the dimensions of digital product presentation and purchase decision at the $\alpha \leq 0.05$ significance level.

-Regression analysis showed that price presentation was the strongest predictor ($\beta = 0.497$), followed by colors and design ($\beta = 0.206$) and images ($\beta = 0.170$). Videos had a positive but weak effect ($\beta = 0.145$), indicating a secondary role, while storytelling ($\beta = 0.010$) had no significant effect.

-The results from the second model indicated that digital product presentation as a whole significantly affected the mediating variable, health awareness, with the regression model being statistically significant ($F = 54.633$, $Sig = 0.000 < 0.05$).

-Digital product presentation combined with health awareness had a positive and statistically significant effect on purchase decision ($Sig = 0.000 < 0.05$).

-Health awareness partially mediates the relationship between the dimensions of videos, colors and design, and price presentation and purchase decision.

-Health awareness does not mediate the relationship between images and storytelling and purchase decision.

Recommendations

-Emphasize clear pricing and highlight the value-for-money aspect to encourage consumer purchase decisions.

-Use visually appealing digital designs with harmonious, comfortable colors that reflect the product identity and its health-related nature.

-Employ high-quality, accurate images that clearly display product features and uses, highlighting all product angles.

-Utilize short, engaging videos that explain product features while enhancing visual content to emphasize the health benefits of the product.

-Incorporate storytelling to focus on the health aspects of the product, its main components, sources, and consumer experiences.

-Integrate reliable and simplified health information within digital content to enhance the effect of digital presentation on purchase decision.

-Price natural products appropriately for the target audience, or offer different sizes to diversify pricing and encourage the consumption of health-oriented products.

-Strengthen the digital presentation strategy for essential oils by focusing on all dimensions and integrating reliable health information into digital content, aiming to maximize its positive influence on consumers' purchase decisions for health-related products.

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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 significant determinant of trust, as it influences the perceived reliability and competence of the communicating entity. Davis (1989) also emphasizes that the perception of a

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technology's usefulness and ease of use is key to its acceptance, and that the mode of communication can significantly shape these perceptions.

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. Building on this aspect, Tam and Ho (2006) emphasize that the way information is presented and the personalization of communication influence customers' decision-making processes. 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. Glickson and Woolley (2020) also emphasize that trust in artificial intelligence is a complex construct influenced by multiple factors, including the manner of 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. Belanche et al. (2020) emphasize the importance of interaction quality in the context of services, while Vlačić et al. (2021) highlight the growing role of artificial intelligence in marketing and its impact on customer behaviour.

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.

Kalaš (2025) also highlights the importance of linguistic aspects in the context of artificial intelligence, emphasizing that the quality of language processing directly influences the interpretation of meaning and the effectiveness of communication in an economic environment.

Despite the growing importance of this issue, the linguistic dimension of chatbot communication remains relatively under-researched compared to technological and behavioural aspects, particularly in the context of Central Europe. A systematic examination of linguistic dimensions and their impact on trust and customer experience therefore represents a relevant contribution to the advancement of knowledge in the fields of marketing and digital communication.

While existing research focuses on trust in AI and the customer experience, a systematic analysis of the linguistic dimensions of chatbot communication as a distinct factor influencing customer perception and behaviour remains underdeveloped in the literature. This gap is particularly problematic in the context of marketing practice, where language is one of the main tools for influencing customer decision-making. The absence of a systematic understanding of linguistic dimensions thus limits the potential for optimizing AI communication in terms of effectiveness and conversion.

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. The paper

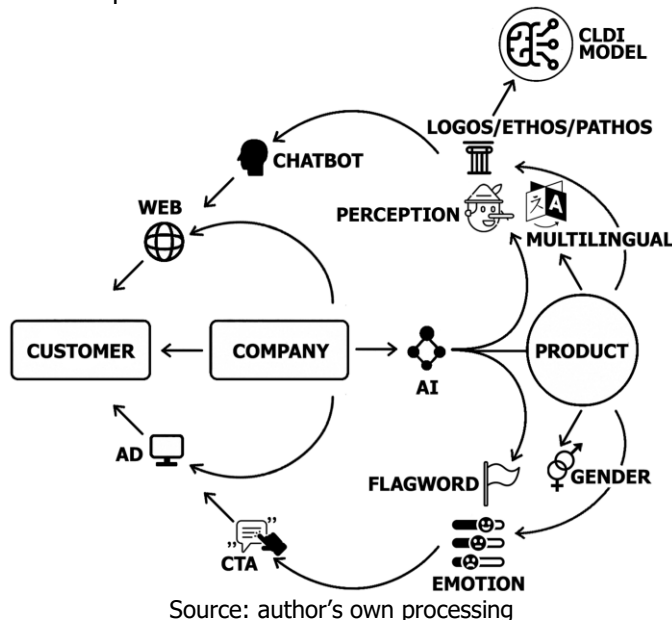
also presents a partial outcome of long-term research focused on language as a sales tool in the field of artificial intelligence.

1 Methodology

This paper is designed as a combination of theoretical and empirical approaches, drawing on the interdisciplinary connection between linguistics and marketing. The theoretical section focuses on identifying key linguistic and communicative factors influencing customer experience, trust, and behaviour in an artificial intelligence environment. The empirical section then verifies selected relationships based on quantitative research conducted via a questionnaire survey.

To conceptualize the issue under investigation, a model was developed as part of a broader research effort (Fig. 1) that captures the complex relationships between language, marketing elements, and customer behaviour in an artificial intelligence environment. This model represents the broader research framework of a project focused on language as a sales tool and 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. The model also reflects the role of artificial intelligence as a mediator of communication between the company and the customer, emphasizing the importance of perception as a central mediator influencing customer behaviour.

Fig. 1 Conceptual model of AI communication with the customer



Within this model, this paper focuses on one specific dimension: chatbot communication as a key point of interaction between the customer and the company. The chatbot represents the first point of contact where language is directly reflected in the

customer experience, and the quality of linguistic means influences perceptions of trustworthiness, competence, and the overall quality of communication. The empirical part of the research therefore operationalizes language as a set of specific dimensions that can be quantitatively measured and analysed.

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 also divided into four categories based on their level of education, which allowed for the analysis of potential differences between individual groups. Individual variables were rated on a Likert scale from 1 to 7, which captures the intensity of respondents' attitudes and is suitable for subsequent statistical analysis.

The questionnaire was designed to capture the multidimensional nature of language quality. Respondents evaluated their overall experience with chatbots as well as eight linguistic dimensions: grammatical correctness, lexical richness, syntactic complexity, communicative coherence, pragmatic appropriateness, stylistic consistency, semantic accuracy, and the use of discourse markers. The selection of these dimensions assumes that language quality is not one-dimensional but consists of several interconnected aspects that collectively influence the perception of communication and subsequent customer behaviour.

Based on the theoretical foundations outlined above, it can be assumed that the perception of language quality may be influenced by the individual characteristics of users. Consequently, hypotheses were formulated with the aim of identifying differences among individual groups of respondents.

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 (grammatical correctness, lexical richness, syntactic complexity, coherence, pragmatic appropriateness, stylistic consistency, semantic accuracy, and the use of discourse markers).*

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.*

Several statistical methods were used to analyse the data, enabling a comprehensive assessment of the relationships between variables. Multivariate analysis of variance (MANOVA) was used to test for differences between groups of respondents while simultaneously accounting for multiple dependent variables, which corresponds to the multidimensional nature of language quality. Subsequently, univariate tests (ANOVA) were applied to identify specific differences in individual language dimensions. Nominal regression was also used as part of the exploratory analysis, which allowed us to examine the relationships between behavioural variables and the education category. MANOVA was chosen because it allows for the simultaneous examination of multiple language dimensions, which together form a comprehensive picture of chatbot communication evaluation and enable their joint assessment.

When interpreting the results, it is important to consider the limitations of the study. The sample of respondents was not strictly representative, and some groups were underrepresented, which may affect the generalizability of the results. At the same time, these are subjective assessments by respondents, which may be influenced by individual experiences, expectations, or the extent of their interaction with chatbots. Another limitation is the study's focus on only one dimension of a broader model, meaning that other factors

(e.g., emotions, CTAs, or multilingualism) were not empirically tested at this stage. Despite these limitations, the research provides relevant insights into the role of language in chatbot communication and its impact on customer experience and trust.

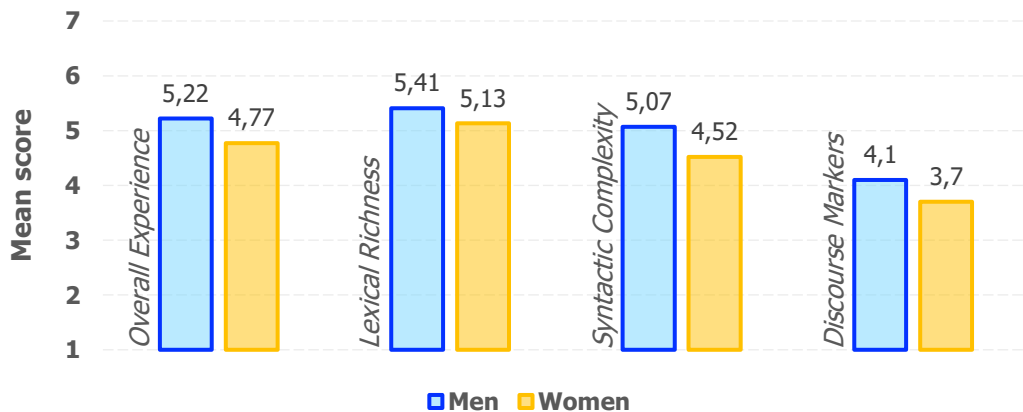
2 Results and Discussion

The data analysis was based on a sample of 411 respondents and focused on identifying relationships between the linguistic quality of chatbot communication and users' perceptions of it, as well as on uncovering differences among individual groups of respondents. Given the multidimensional nature of the variables under study, multivariate analysis of variance (MANOVA) was used as the primary analytical tool, as it allows for the simultaneous assessment of the influence of independent variables on a set of dependent variables.

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. Although the effect size can be considered relatively small, its statistical significance suggests that gender is a relevant factor influencing the perception of language quality.

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 ; $p = 0.020$).

Fig. 2 Comparison of chatbot language dimension evaluation by gender



Source: author's own processing

As can be seen in Figure 2, the most pronounced difference between men and women is evident in syntactic complexity, where the gap between the groups is the widest. In

contrast, the differences are more moderate in lexical richness, suggesting that not all linguistic dimensions are perceived with the same sensitivity.

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. It is precisely these dimensions that are related to the naturalness of language, its variability, and its ability to adapt to context. From this perspective, the results can be interpreted to mean that women approach the evaluation of communication more critically, particularly in areas that go beyond basic functionality and concern the quality of interaction as such. This finding is consistent with the findings of Araujo (2018), who highlights the importance of the form of communication in shaping perceptions of technological solutions and customer interaction.

From a marketing perspective, this result is significant, as it indicates that the language used by chatbots does not affect all customers in the same way. If language shapes the perception of interaction quality, then differences in how it is perceived can lead to varying assessments of the brand and its credibility. In the context of the model presented in the methodological section, these results can be interpreted to mean that language enters into the process of shaping perception, which subsequently influences customer behaviour. The findings also support the conclusions of Glikson and Woolley (2020), according to whom trust in AI systems also depends on the manner of communication and presentation of information.

The most significant differences were identified in syntactic complexity ($p < 0.001$), suggesting that this linguistic dimension is the most sensitive factor in the perception of chatbot communication quality. Based on the results of the multivariate analysis of variance, it can be concluded that Hypothesis H1 was confirmed, as statistically significant differences were found between men and women in the evaluation of chatbot communication. Although the effect size was relatively small, the results suggest that gender is a relevant factor influencing the perception of linguistic dimensions.

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. The language of chatbots cannot therefore be viewed merely as a technical tool for conveying information, but as a strategic marketing tool with the potential to influence customer trust, satisfaction, and subsequent behaviour. These findings also confirm the relevance of the conceptual model, as they empirically support the role of linguistic dimensions as an input factor influencing perception within AI communication.

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. It is particularly important to consider the diversity of customers and adapt the language of communication to reflect the expectations of different target groups.

Based on the results, several specific recommendations for marketing practice can be formulated. First, chatbot language should be designed with an emphasis on naturalness and variability; the use of synonyms, flexible phrasing, and contextual adaptation can enhance the positive perception of communication. Second, it is important to pay attention to pragmatic aspects of communication, such as the appropriate level of formality or personalization, which influence perceptions of empathy and trust. Third, organizations should test different linguistic variations of communication and evaluate their impact on customer behaviour, thereby optimizing the effectiveness of digital communication. Organizations should pay particular attention to the syntactic complexity of communication, which has proven to be the most sensitive linguistic dimension influencing the perception of interaction quality.

The results also highlight the need for further research focusing on other dimensions of the conceptual model, such as emotional elements, call-to-action mechanisms, or multilingualism. These factors, when combined with language quality, can form a comprehensive framework that influences customer behaviour in the digital environment.

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, with particular attention paid to differences among individual user groups.

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, which has important implications for the standardization of digital communication.

In the context of the conceptual model presented, these findings can be interpreted as empirical confirmation of the central role of perception as a mediator between linguistic elements and customer behaviour. In this model, language functions not merely as a carrier of information, but as a tool that activates cognitive and emotional processes leading to the evaluation of the interaction and subsequent decisions. The results thus support the assumption that language represents one of the main mechanisms through which artificial intelligence influences customer behaviour.

From the perspective of a broader research framework, these findings represent an important partial outcome that helps operationalize our research concept at a concrete, empirically measurable level. The analysis of chatbot communication as one of the model's dimensions confirms its applicability and simultaneously opens the door to systematic exploration of other factors, such as emotional elements of communication, call-to-action strategies, and multilingualism.

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. In this way, it is possible to shift research from the descriptive level to the applied level, which has a direct impact on practice.

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

Lucia Šátková²

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

JEL Classification: O33, O47, Q01

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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.

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

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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; prior reviews have examined AI and sustainability (Bracarense et al., 2022) or AI and productivity separately, but not their joint treatment. The specific objective of this paper is therefore 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. This mapping provides a transparent and replicable evidence base that identifies key structural features of the research stream and makes visible the gaps that guide subsequent analytical work.

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, including database selection, search strategy, and the two-stage content-analysis protocol applied in this paper. 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, with an emphasis on identifying publication trends and document types, geographic concentrations disciplinary patterns that characterize this emerging research field and key journals. 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), and the combination of both databases reduces the risk of systematic gaps in the retrieved sample.

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; stages three and four are addressed in a companion paper. In addition, the bibliometrix® package for R (Aria and Cuccurullo, 2017) was used to process bibliographic data and produce quantitative indicators of citation impact and publication patterns. This tool has been applied in a number of recent structured reviews on AI-related topics (Bracarense et al., 2022).

The terms “Artificial Intelligence”, “Sustainability”, and “Productivity” were chosen as keywords to cover the thematic focus of the review. The search was conducted using the Boolean operator AND, which ensured that retrieved publications addressed all three concepts simultaneously. In Web of Science, the search was applied across title, abstract, author keywords, and KeyWords Plus fields. In Scopus, it was applied across title, abstract, and keywords. To illustrate the scale of the literature for each individual concept and to

justify the need for combining terms, the keywords were also tested separately — producing results in the hundreds of thousands for each term (see Table 1 in Section 2). Searches were conducted on 3 December 2025; no language filter was applied, as all retrieved records were available in English.

Because the combined query still returned a broad set of results in Scopus (1.185 records), the term "Productivity" was replaced with "Business Productivity" to better reflect the paper’s focus on firm-level performance. This adjustment reduced the Scopus results to 157 documents. The same refinement was tested in WoS but returned only 65 results, which was considered too narrow; accordingly, the original WoS query was retained (525 results).

After the initial retrieval, records were screened through a three-step process: database-level filters (research areas, subject areas, WoS categories, and document types), abstract screening for topic relevance, and deduplication across databases. The full screening procedure and its outcomes are reported in Section 2 (Table 2). The final sample comprised 29 unique peer-reviewed documents — journal articles, review articles, and book chapters — which form the basis of the descriptive analysis presented in this paper.

The descriptive analysis examined the following formal characteristics of the selected documents: (1) annual distribution of publications, documenting trends in scholarly output over the study period; (2) document type structure; (3) geographic distribution of author affiliations, providing an indicative view of where research activity is concentrated; (4) disciplinary classification using WoS category and Scopus subject-area distributions; (5) citation impact indicators, including total citations, citations per year, and normalized citations per year, computed using bibliometrix; and (6) publication outlet quality, assessed through Journal Impact Factor (JIF), CiteScore, and WoS/Scopus quartile rankings.

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 to delimit a manageable and focused sample.

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 from initial retrieval to the final sample. In WoS, a research-areas filter removed 451 records from the initial 525, retaining areas such as Business Economics, Operations Research/Management Science, Public

Administration, Development Studies, and International Relations. A WoS category filter then removed a further 18 records, retaining categories including Management, Economics, Business, and Environmental Studies. A document-type filter removed 7 additional records, restricting the sample to articles, review articles, and book chapters. This produced 49 documents for abstract screening, of which 23 were retained after reading for topic relevance. In Scopus, a subject-area filter removed 94 records from the 157-result refined query, retaining areas such as Business, Management and Accounting; Economics, Econometrics and Finance; and Multidisciplinary. 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.

Tab. 2 Process of study selection (WoS and Scopus)

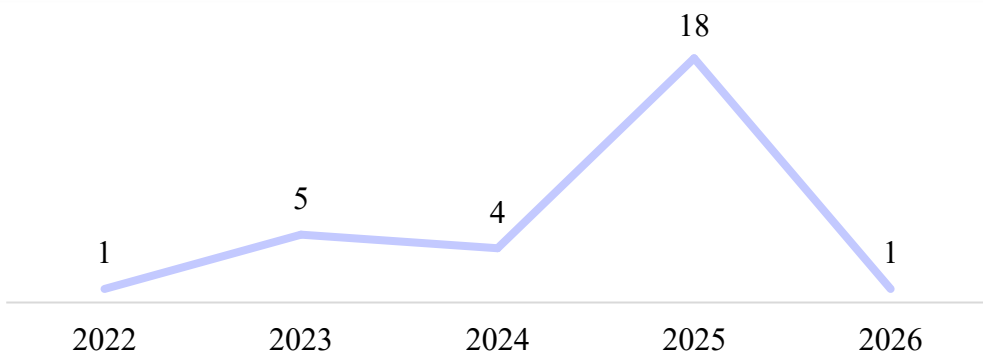
Stage	WoS	Scopus	Total	Notes
Identification (initial search results)	525	157	682	Scopus count reflects the refined query using "Business Productivity" (instead of "Productivity")
Filtering (database-level restrictions applied)				
Excluded by research areas / subject areas	451	94	545	WoS: selected business/econ/OR-MS/public admin/development/education/IR; Scopus: business & management, economics/finance, multidisciplinary
Remaining after research/subject filters	74	63	137	
Excluded by WoS categories	18	—	18	WoS only (e.g., management, economics, business, development studies, IR, environmental studies/sciences)
Remaining after WoS category filter	56	63	119	
Excluded by document type	7	21	28	Kept: articles, review articles, book chapters
Records screened (abstract screening)	49	42	91	Abstracts read for topic relevance
Excluded after abstract screening	26	31	57	Not sufficiently aligned with AI-sustainability-(business) productivity focus
Records included after abstract screening	23	11	34	Eligible set before deduplication
Deduplication (across WoS + Scopus)				
Duplicates removed			5	Overlaps between databases
Final sample included in review			29	Final dataset used for descriptive analysis + synthesis

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

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 (Figure 1). The drop from 2023 to 2024 is likely a reflection of the publication cycle — research prompted by the 2022 emergence of large language models (Durach and Gutierrez, 2024) would typically have appeared in journals with a one-to-two-year lag — whereas the sharp surge in 2025 ($n = 18$) indicates rapidly intensifying scholarly attention. Because searches were conducted on 3 December 2025, only one publication dated 2026 was captured, meaning the 2025 count is not yet complete at the time of data collection.

Fig. 1 Publications per year in Web of Science and Scopus



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

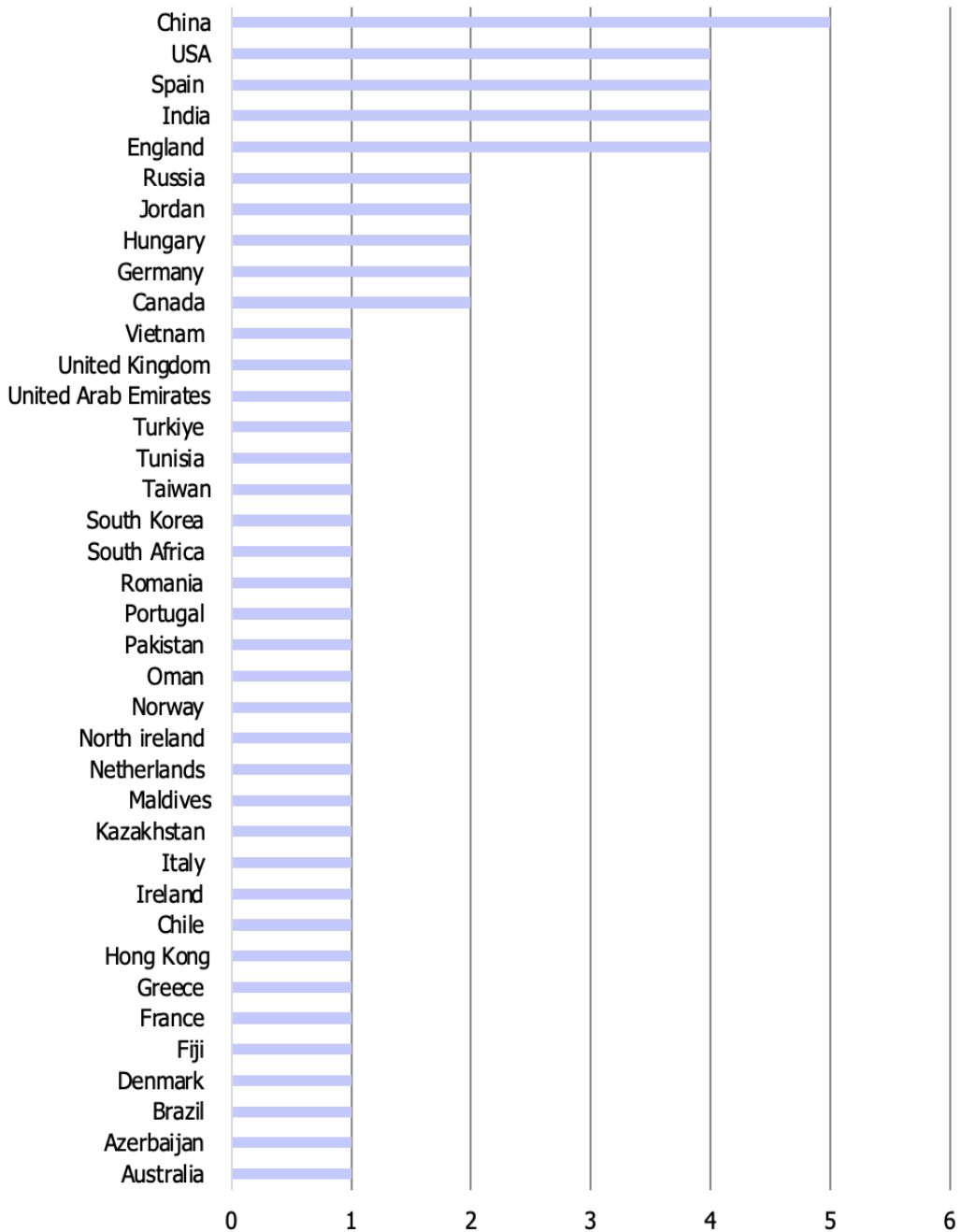
Regarding document types, the sample includes 23 articles, 2 review articles, and 4 book chapters. The predominance of journal articles indicates that the field is developing primarily through peer-reviewed empirical and theoretical contributions, while the inclusion of book chapters reflects multidisciplinary engagement with edited volumes on AI, sustainability, and digital transformation (see e.g. Jenefa et al., 2025; Lok et al., 2025; Thota et al., 2025).

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), while all remaining countries are represented by a single affiliated author (see Figure 2). Several publications involve co-authors from multiple countries, meaning a single study may contribute to counts in more than one national affiliation category. The concentration of research activity in China and advanced Western economies — with virtually no representation from low-income developing countries — is noteworthy and points to a structural asymmetry in who produces knowledge about AI and its effects. This mirrors the broader geography of AI research (Dauvergne, 2022), in which data infrastructure, institutional capacity, and funding tend to favour already-advanced

economies, leaving the experiences of lower-income contexts empirically invisible in the literature.

Fig. 2 Publications by Country/Region in Web of Science and Scopus



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

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). Further categories include Green and Sustainable Science and Technology (3) and Development Studies (3), while Political Science (2), International Relations (2), and Industrial Engineering (2) appear less frequently. The remaining categories — Industrial Relations and Labor, Environmental Studies, Environmental Sciences, Energy and Fuels, and Business Finance — are each represented by a single record. The distribution points to a multidisciplinary character, though it also reflects the predefined research-area restrictions applied during screening. Table 3 reports the WoS categories assigned to each individual publication; the multi-category assignments (e.g. Melguizo et al., 2026; Tiwari et al., 2025; Zhang et al., 2025; Wang et al., 2025) illustrate that many contributions span more than one discipline.

Tab. 3 Web of Science categories by individual publication

Authors	WoS Categories
Melguizo et al., 2026	Economics; Energy and Fuels; Environmental Sciences; Environmental Studies
Tiwari et al., 2025	Development Studies; Green and Sustainable Science and Technology; Regional and Urban Planning
Zhang et al., 2025	Development Studies; Green and Sustainable Science and Technology; Regional and Urban Planning
Zhou et al., 2025	Business
Wang et al., 2025	Development Studies; Green and Sustainable Science and Technology; Regional and Urban Planning
Chen et al., 2025	Business, Finance; Economics
Raman et al., 2025	Economics
Jaboob et al., 2025	Business
Thota et al., 2025	Management
Sehnem et al., 2025	Management
Huo et al., 2025	Economics
Iskakova et al., 2025	Economics
Gandía et al., 2025	Business; Regional and Urban Planning
Badea et al., 2024	Business; Economics; Management
Nzama et al., 2024	Economics; Management
Durach and Gutierrez, 2024	Management
Sharma, 2023	Industrial Engineering; Management
Budhwar et al., 2023	Industrial Relations and Labor; Management

Torrent-Sellens, 2024	Economics; International Relations; Political Science
Singh et al., 2023	Management
Calabrese et al., 2023	Business; Regional and Urban Planning
Sharma et al., 2024	Business; Industrial Engineering; Management
Dauvergne, 2022	Economics; International Relations; Political Science

Source: Own processing based on Web of Science results.

The most represented Scopus subject area is Business, Management and Accounting (6), followed by Computer Science (3) and Economics, Econometrics and Finance (3). Engineering (2) follows, while Mathematics, Environmental Science, Decision Sciences, and Social Sciences are each represented by a single publication. As with WoS categories, Scopus subject areas are not mutually exclusive; Table 4 shows that several publications — such as Thota et al. (2025) and Jeneffa et al. (2025) — span three or four areas simultaneously. Taken together, both classification systems reflect a business- and economics-anchored multidisciplinary profile consistent with a field that sits at the junction of management science, digital technology, and sustainability policy.

Tab. 4 Scopus subject area by individual publication

Authors	Scopus Subject Area
Chang et al., 2025	Business, Management and Accounting; Social Sciences
Jeneffa et al., 2025	Business, Management and Accounting; Computer Science; Economics, Econometrics and Finance
Pandey and Joseph, 2025	Business, Management and Accounting; Computer Science; Economics, Econometrics and Finance
Thota et al., 2025	Business, Management and Accounting; Economics, Econometrics and Finance; Engineering; Environmental Science
Lok et al., 2025	Business, Management and Accounting; Computer Science; Decision Sciences; Mathematics
Arora et al., 2025	Business, Management and Accounting; Engineering

Source: Own processing based on Scopus results.

2.5 Citation Indicators

Table 5 presents the citation impact of the selected publications. The three metrics reported are: total citations (TC), citations per year (TC/year), and normalized citations per year. Normalized citations per year are calculated by bibliometrix as a publication's annual citation rate divided by the average annual citation rate of all publications in the sample for the same year, so that a value above 1.0 indicates above-average visibility relative to peers published in the same year (Aria and Cuccurullo, 2017). The citation distribution is highly

concentrated: a small number of articles account for a disproportionate share of total citations, a pattern typical of emerging research streams.

The most cited publication is Budhwar et al. (2023) with 349 total citations and 87.25 citations per year, reflecting its status as a high-profile invited review in a leading HRM journal. Dauvergne (2022) ranks second with 132 total citations and 26.40 per year — the only publication from the earliest year in the sample, giving it more time to accumulate citations. Sharma et al. (2024) records 63 citations and 21.00 per year, while Calabrese et al. (2023) reaches 43 citations and 10.75 per year. The normalized citations per year metric highlights that some newer publications achieve strong annual visibility despite lower total citation counts. Arora et al. (2025) records a normalized score of 5.04, while Gandía et al. (2025) and Dhayal et al. (2025) show values of 2.84 and 2.68, respectively. Multiple 2025 publications show zero citations at the time of data collection, which is expected given their limited time to accumulate citations.

Tab. 5 Citation indicators for included publications (total citations, citations per year, and normalized citations)

Authors	TC	TC per Year	Normalized TC
Budhwar et al., 2023	349	87.25	3.25
Dauvergne, 2022	132	26.40	1.00
Sharma et al., 2024	63	21.00	3.39
Calabrese et al., 2023	43	10.75	0.40
Singh et al., 2023	29	7.25	0.27
Arora et al., 2025	21	10.50	5.04
Durach and Gutierrez, 2024	18	6.00	0.97
Gandía et al., 2025	18	9.00	2.84
Dhayal et al., 2025	17	8.50	2.68
Wang et al., 2025	12	6.00	1.89
Sharma, 2023	9	2.25	0.08
Sehnem et al., 2025	7	3.50	1.11
Raman et al., 2025	6	3.00	0.95
Torrent-Sellens, 2024	6	2.00	0.32
Zhang et al., 2025	6	3.00	0.95
Badea et al., 2024	4	1.33	0.22
Chen et al., 2025	4	2.00	0.63
Iskakova et al., 2025	4	2.00	0.63
Chang et al., 2025	2	1.00	0.48
Jaboob et al., 2025	2	1.00	0.32
Melguizo et al., 2026	2	2.00	1.00
Nzama et al., 2024	2	0.67	0.11
Pandey and Joseph, 2025	2	1.00	0.48

Huo et al., 2025	0	0.00	0.00
Jenefa et al., 2025	0	0.00	0.00
Lok et al., 2025	0	0.00	0.00
Thota et al., 2025	0	0.00	0.00
Tiwari et al., 2025	0	0.00	0.00
Zhou et al., 2025	0	0.00	0.00

Note: Database exports updated on 4 January 2026; citation counts reflect values available in WoS and Scopus up to that date. Source: Own processing; citation indicators computed in R using bibliometrix (Aria and Cuccurullo, 2017).

2.6 Publication Outlets and Journal Quality Indicators

Table 6 reports the journals in which the selected publications appeared, together with the Journal Impact Factor (JIF), CiteScore, and WoS/Scopus quartile rankings for 2024. 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. This dispersion is consistent with the field’s nascent and multidisciplinary character, as authors are situating their contributions within different disciplinary communities rather than converging on a shared outlet.

A substantial proportion of publications appear in high-ranked journals. Most outlets hold Q1 classification in WoS and/or Scopus, with particularly strong representation in journals such as Technological Forecasting and Social Change (JIF 13.3), Technology in Society (JIF 12.5), Journal of Business Research (JIF 9.8), and Energy Policy (JIF 9.2). The sample also includes Q2 and Q3 journals, as no quartile restriction was applied during screening. Excluding lower-ranked outlets would have removed only two articles from the sample — the Romanian Journal of Economic Forecasting and the Montenegrin Journal of Economics (both Q3) — and the decision not to impose such a ceiling reflects the nascent nature of the field, where a quality threshold designed for mature literatures could systematically exclude novel or regionally specific contributions.

Tab. 6 Publication outlets and journal visibility indicators (JIF, CiteScore, WoS and Scopus quartiles)

Journal Name	Number of Articles	JIF	CiteS core	Quartile WoS	Quartile Scopus
Sustainable Development	3	8.2	14.5	Q1	Q1
Technological Forecasting and Social Change	2	13.3	26.3	Q1	Q1
Energy Policy	1	9.2	19.1	Q1	Q1
Amfiteatru Economic	1	2	4	Q2	Q2
Asia-Pacific Journal of Business Administration	1	4.6	9.6	Q2	Q1
Benchmarking: An International Journal	1	4.4	11.5	Q2	Q1

Equilibrium. Quarterly Journal of Economics and Economic Policy	1	6.2	9.8	Q1	Q1
Human Resource Management Journal	1	6.2	13.7	Q1	Q1
IEEE Engineering Management Review	1	-	4.9	-	Q2
IEEE Transactions on Engineering Management	1	5.2	9.7	Q1	Q1
International Journal of Physical Distribution & Logistics Management	1	7.3	14.1	Q1	Q1
International Review of Economics & Finance	1	5.6	7.3	Q1	Q1
Journal of Business Research	1	9.8	25.3	Q1	Q1
Montenegrin Journal of Economics	1	-	3.8	Q3	Q3
New Political Economy	1	4.6	9.4	Q1	Q1
Operations Management Research	1	5.3	-	Q1	-
Review of International Political Economy	1	3.5	9.2	Q1	Q1
South African Journal of Economic and Management Sciences	1	1.4	2.3	Q2	Q2
Social Responsibility Journal	1	4.1	7.4	Q2	Q1
Romanian Journal of Economic Forecasting	1	1.0	-	Q3	-
Technology in Society	1	12.5	21.9	Q1	Q1
Engineering Management Journal	1	2.6	4.5	-	Q2

Note: All journal metrics refer to 2024, except the JIF of the Romanian Journal of Economic Forecasting (2023, due to data availability). Source: Own processing.

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 ($n = 18$), suggesting that the topic has moved from marginal to prominent on academic agendas within a very short period. Second, the field is multidisciplinary but gravitates towards management and economics, with output concentrated in high-quality journals, indicating that the emerging consensus about the field's intellectual home is anchored in business and social science rather than computer science or engineering. 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 — including infrastructure reliability, digital skills, and access to capital — 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. By documenting precisely where the literature exists, how it is distributed across disciplines and geographies, and which outlets carry it, this mapping exercise makes the field's structural asymmetries visible and quantifiable. The most significant of these asymmetries — the near-complete absence of developing-country evidence — constitutes a research gap that cannot be addressed through re-analysis of existing studies but requires new primary data collection. A companion paper applies the remaining two stages of the content-analysis protocol to synthesize the literature through six analytical questions and to translate this structural gap into a concrete research direction.

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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), providing potential benefits to both consumers and producers, promoting

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environmental and biodiversity conservation, and assisting in the operation of models for sustainable development (Nguyen, 2023).

Meanwhile, the worldwide environmental awareness has prompted the Algerian authorities to shift their activities into more eco- friendly ways (Jan, 2023). and 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, which sets out the terms and conditions for the creation, organization, operation and financing of this system in Algeria (AND.DZ). 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 which ecology is not necessarily a priority, with a regulatory framework that is far from binding, but which is developing day by day (Djemai Sabrina, 2020).

Integrating eco-labels has a positive impact on companies worldwide by enhancing their reputation, fostering customer loyalty, and often leading to increased market share as consumers become more environmentally conscious (Pancić, 2023). The success or failure of planning of eco-labeling lies in understanding of consumers' awareness, needs and willingness to pay (Nguyen, 2023). There are indications that consumers do not always act on these concerns, causing an attitude–behavior gap (Taufique, 2014).

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's important to ask this question:

How does the attitude towards eco-friendly products impact Algerian consumer behaviour purchases?

Develop study hypotheses

Ecolabels on product packaging signifies 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). For example, the use of eco labels to expose sustainable methods is gaining popularity among farmers engaged in the sustainable cultivation of their products to receive a premium for them. (Chen, 2018). 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. By granting information about this "credit product," manufacturers can guarantee consumers of their sustainable production methods. (Mariëtte van Amstel, 2008).

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

Since consumers regard eco label as an essential element of green brands, it can help boost the relevance of associations and even further affect brand image (Huang, 2022), Meanwhile, Schmidt's et al (2017) confirm that when eco-labeling is utilized correctly, it can expand brand knowledge and help shape brand image. Additionally (Ina Rizqiyana, 2020) state that if the green marketing tool is improving, it will progressively affect the brand image. Therefore, it will have a significant influence on the rising consumer purchasing behavior.

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. They can also provide a competitive advantage to manufacturers over others who have failed to apply for the label by capitalizing on consumers' desire to "shop green" when using the label to promote their products (Gertz, 2005). This increases demand for eco-friendly products, which can motivate producers to adopt more sustainable practices (Ecolabel Institute, 2024).

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

in recent years, Consumers has been place great importance on environmental protection and sustainability (Ziyeh & Cinelli, 2023). Therefore, they are continuously working on searching for information on the use of scarce resources and the recycling of products. (Hameed, 2018). Evidence of this value creation is the increasing number of consumers that are willing to pay more for eco-labeled products. (Prieto-Sandoval, 2016). This behavior of 'willing to pay more' for green products is shown in many cases. In particular, participants with generally positive attitudes toward environmentally friendly consumer behavior exhibited a systematic taste preference bias toward environmentally friendly alternatives. Also, participants' willingness to pay more for "green" coffee increased, especially if they liked the taste. (Sörqvist, 2015).

Numerous researchers have documented that consumers are willing to pay a higher price for food products that are labeled as environmentally friendly (Chen, 2018). also, some research has shown that consumers are willing to pay a premium for products with eco-labels (organic, environmental or sustainable) (Proi, 2023).

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

3 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, providing valuable insights into their perceptions and behaviors regarding eco-friendly products.

Data Collection Method and Tool

In this research, we opted for the quantitative method through the questionnaire survey to collect the necessary data for our study.

The questionnaire

In order to collect data for this study, a questionnaire consisting of three parts was designed.

Part 1: Admissibility

This section explores the Algerian consumer's familiarity with eco-friendly products, their preferred type, and the importance of environmental labels in their purchasing decisions through three introductory questions.

Part 2: Consumer Behavior Towards Eco-Friendly Products

This section is divided into five sub-sections, each addressing a specific study variable. A Likert scale is employed to gauge respondents' attitudes and perceptions, with questions for each variable informed by theoretical constructs from the relevant literature.

Table 1. Measurement scales for the variables

<i>Variables</i>	<i>Items</i>	<i>Source</i>	<i>Cronbach's alpha</i>
Attitude towards buying eco-friendly diapers	1- Buying eco-friendly diapers is a good decision 2- Buying eco-friendly diapers is a good idea. 3- Buying eco-friendly diapers is a good idea. 4- Buying eco-friendly diapers is a wise decision.	<i>(Chen et al, 2015)</i>	0,853
Credibility	1- Bebem Natural gives my baby security 2- The Bebem Natural brand offers credible products 3- Buying Bebem natural is a guarantee 4- I trust the quality of Bebem Natural	<i>(Chen et al, 2015)</i>	0,894
Brand Image	1- Bebem Natural is a leading brand in its field 2- Bebem Natural is a renowned brand 3- Bebem Natural products are very popular 4- The Bebem Natural brand has a good reputation 5- The Bebem Natural brand always keeps its promises to its customers	<i>Paramod et al 2018)</i>	0,883
Purchase Intention	1- I want to buy Bebem Natural diapers in the future	<i>Nguyen, et al., 2023</i>	0,910

	<p>2- I intend to buy Bebem Natural diapers frequently in the future.</p> <p>3- I plan to buy Bebem Natural baby diapers</p> <p>4- I'm going to try to buy Bebem Natural baby diapers.</p> <p>5- I want to buy Bebem Natural baby diapers</p>		
Willingness to Pay More for an eco-friendly product	1- I'm willing to pay more for an eco- friendly product	<i>Nguyen, et al., 2023</i>	/

Source: Developed from the relevant literature

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.

Part 3: Respondent profiles

This section is dedicated to questions that are related to the respondent's information and contains three questions, gender, age and education level.

Study Sample and Sampling

In the data collection phase, we opted for non-probability sampling methods and more specifically the non- probability sampling method because our population is infinite and the product is a product consumed by a large number of people in Algeria

To calculate the sample size for this study, we used the surveymonkey.com website which is specialized in calculating sample sizes for research where we put an error margin of 6.8% and a confidence interval of 95% and we received a sample size estimation of 246.

4 Results and Discussion

4.1 Respondent profiles:

The profiles of survey respondents reveal several interesting trends. 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%). Those aged 35 to 44 account for 17.1% of respondents, while those aged 45 to 54 and over 55 are in the minority (8.1% and 0.8% respectively). This suggests that young adults and young parents are most concerned by issues relating to baby diapers.

In terms of level 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 (BTS, DUT, Licence). Only 7.3% of respondents have a high school diploma (BAC) and 5.3% have no diploma at all. These data show that respondents are generally well educated.

4.2 Familiarity with "Eco-friendly product", "Organic" and "Natural" products

In this section, the extent of Algerian consumer interest in environmentally friendly products will be measured, and which type is most important to them.

Tabel 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. This high level of familiarity suggests that consumers are increasingly aware of and interested in environmentally-friendly products and those using natural and organic ingredients. Only a small fraction of respondents are unfamiliar with these types of products, indicating a strong general awareness of these concepts. For brands offering products in these categories, this represents a significant opportunity, as there is a well-informed consumer base potentially receptive to their offerings.

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% of respondents attach importance to a product being environmentally friendly, underlining a strong awareness of ecological concerns. Finally, 19.1% of respondent's value organic products, but to a lesser degree than natural and environmental products. These percentages suggest that manufacturers should prioritize the natural characteristics of their products to appeal to the majority of consumers, while integrating ecological and organic aspects to meet a diversity of preferences and environmental sensitivities.

4.3 The importance of the Ecolabel on products for the Algerian consumer

This question aims to study the importance of the eco labeling on eco-friendly products for the Algerian consumer.

Tabel 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 of this question 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.

4.4 Consumer Behavior Towards Eco-Friendly Products

Tabel 3 Consumer Behavior Towards Eco-Friendly Products

Variable	Itemes	Arithmetic mean	Standard deviation	Evaluation
attitude towards eco-friendly	Buying eco-friendly diapers is a good decision	3.73	1.112	Agree
	Buying eco-friendly diapers is a good idea	3.74	1.191	Agree
	Buying eco-friendly diapers is a wise decision	3.77	1.084	Agree
	Buying diapers that respect the environment is an admirable decision.	3.59	1.205	Agree
	Total	3,70	/	Agree
Credibility of Bebem Natural baby diapers	Bebem Natural gives my baby security	3.50	1,102	Agree
	I trust the quality of Bebem Natural	3,40	1,130	Neutral
	Buying Bebem Natural is a guarantee	3,41	1,194	Agree
	The Bebem Natural brand offers credible products	3,63	1,082	Agree
	Total	3,485	/	Agree
Bebem Natural brand image	Bebem Natural is a leading brand in its field	3,25	1,168	Neutral
	Bebem Natural is a renowned brand	3,06	1,251	Neutral
	Bebem Natural products are very popular	3,10	1,175	Neutral
	The Bebem Natural brand has a good reputation	3,46	1,079	Agree
	The Bebem Natural brand always keeps its promises to its customers	3,51	1,135	Agree
	Total	3,276	/	Neutral

Purchase intention	I want to buy Bebem Natural diapers in the future	3,60	1,094	Agree
	I intend to buy Bebem Natural diapers frequently in the future.	3,46	1,109	Agree
	I plan to buy Bebem Natural diapers	3,54	1,090	Agree
	I'm going to try to buy Bebem Natural baby diapers.	3,69	1,105	Agree
	I want to buy Bebem Natural baby diapers	3,60	1,116	Agree
	Total	3,578	/	Agree
willing to invest more		3,3	1,077	Neutral

Source: Output of the SPSS program.

Overall, the results reveal a favorable attitude towards eco-friendly diapers with an arithmetic average of 3,70. with a recognition of the benefits and wisdom of this choice.

The results of the Bebem Natural diaper credibility assessment indicate a generally positive perception among respondents. With an overall mean of 3.485, respondents express overall agreement with the credibility of the products. The combination of these ratings shows that, despite a certain neutrality on quality, there is a notable recognition of the safety and reliability of Bebem Natural diapers.

The results of the Bebem Natural brand image assessment show an overall neutral perception among respondents. In summary, that, although Bebem Natural is perceived as having a good reputation and delivering on its promises, it is not necessarily seen as a leading, renowned or very popular brand. is not perceived as particularly leading or renowned, it is still respected for its reliability and integrity.

However, two aspects stand out positively. Respondents agree that Bebem Natural has a good reputation and always keeps its promises to its customers. This suggests that, even if the brand

The results of the Bebem Natural diaper purchase intention assessment show an overall positive attitude among respondents. On average, respondents expressed agreement with the idea of purchasing Bebem Natural diapers in the future, indicating a favorable disposition and positive perception of the product. They also express the intention to buy them frequently, suggesting that they plan to integrate these diapers into their regular purchases. In addition, respondents plan to buy these diapers, showing a concrete commitment to the brand. They are also willing to try these diapers, reflecting curiosity or confidence in the product.

Hypothesis Testing:

To test the hypothesis, multivariate regression analysis was used as shown below:

Table 4: Multivariate Tests

Attitude towards eco-friendly products	Wilks' Lambda	Value	Sig
		0.320	<0.001

Source: Output of the SPSS program.

Wilks' Lambda analysis for attitude test reveals significant results. Wilks' Lambda is a statistic used in multivariate analysis, notably in the context of MANOVA (multivariate analysis of variance) tests, to assess whether the means of several dependent variables are equivalent between the groups defined by the independent variables.

Wilks' Lambda value is 0.320, indicating the proportion of total variance in the dependent variables that is not explained by differences between groups. A value closer to 0 indicates greater separation between groups in terms of their multivariate means.

The significance value (Sig) is less than 0.001, indicating that the results are highly significant. In other words, there is a statistically significant difference between the groups in terms of their attitudes. Justifying that the groups do not share the same means for the dependent variables measured.

Table 5: Tests of Between-Subjects Effects

<i>Attitude eco-friendly products</i>	<i>Dependent Variables</i>	<i>R</i>	<i>R²</i>	<i>R² Adjusted</i>	<i>F</i>	<i>Sig</i>
	<i>Credibility</i>	<i>0.633</i>	<i>0.401</i>	<i>0.353</i>	<i>8.375</i>	<i><0.001</i>
	<i>Brand Image</i>	<i>0.610</i>	<i>0.373</i>	<i>0.323</i>	<i>7.456</i>	<i><0.001</i>
	<i>Purchase Intention</i>	<i>0.692</i>	<i>0.480</i>	<i>0.439</i>	<i>11.588</i>	<i><0.001</i>
	<i>WTPM</i>	<i>0.581</i>	<i>0.338</i>	<i>0.285</i>	<i>6.387</i>	<i><0.001</i>

Source: Output of the SPSS program.

The correlation index (R) of 0.633 indicates a moderately strong relationship between the independent variable and the perceived credibility of Bebem Natural baby diapers. The R² value of 0.401 means that 40.1% of the variance in credibility can be explained by the independent variable. The adjusted R² of 0.353 adjusts this estimate according to the number of predictors in the model. The F-index of 8.375, with a significance of less than 0.001, indicates that the impact is statistically significant. Therefore, the first hypothesis is accepted **"Algerian consumers' attitude towards eco-friendly products has an impact on Credibility"**.

For attitude's impact on brand image, R is 0.610, indicating a moderately strong relationship. R² of 0.373 shows that 37.3% of the variance in attitude can be explained by the predictors. Adjusted R² of 0.323 corrects for the number of predictors. The F-index of 7.456, with a significance of less than 0.001, confirms the significance of the impact. Therefore, the second hypothesis is accepted **"Algerian consumers' attitude towards eco-friendly products has an impact on Brand Image"**.

Purchase intention has an R of 0.692, indicating a strong relationship. R² of 0.480 means that 48% of the variance in purchase intention is explained by the predictors.

Adjusted R² of 0.439 adjusts this value for the number of predictors. The F-index of 11.588, with a significance of less than 0.001, indicates that this impact is also statistically significant. Therefore, the third hypothesis is accepted "Algerian consumers' attitude towards eco-friendly products has an impact on Intention to Purchase".

For willingness to pay more, R is 0.581, showing a moderate relationship. R² of 0.338 indicates that 33.8% of the variance is explained by the independent variable. Adjusted R² of 0.285 adjusts this estimate. The F-index of 6.387, with a significance of less than 0.001, indicates that the impact is statistically significant. Therefore, the fourth hypothesis is accepted **"Algerian consumers' attitude towards eco-friendly products has an impact on WTPM"**.

Discussion

Previous studies indicate an increasing interest in environmentally friendly products by consumers, although the success of these products varies from country to country. In this study, which was conducted on a sample of 246 Algerian consumers about Bebem Natural baby diapers, 204 participants (82.9%) of them pay great attention to this environmentally friendly product. This reflects the Algerian consumer's interest in eco-friendly products.

The results also showed that 91.1% responded with yes when questioned if it is important that a product is certified by an eco-label which shows that consumers attach great importance to official validation of the sustainability and environmental impact of products. When it comes to eco-friendly products, 56.5% considered "Natural" labeled products important while 24.4% considered "Environmental" labeled products were more important for them and only 19.1% opted for "Organic" labeled products, which shows that "Natural" labeled products are more preferred by consumers.

The results of this study suggest that positive attitudes towards eco-friendly containing eco labels products significantly influence the perceived credibility which was already revealed by how awareness of ecolabels influences survey participants' trust when purchasing environmentally friendly products. (Rashid, 2009), And from a producer's perspective, eco-labels help build trust and boost product sales. For consumers, they enable the selection of reliable products, guiding marketing and product strategies to meet consumer expectations and when companies use certified eco labels to promote their green products, the consumer's trust increases as confirmed by (Nayeon Kim & Kyungtag, 2023) and (Hameed, 2018).

Secondly, the attitude towards eco-friendly products impacts brand image because ecolabels consciousness contributes to create a sustainable brand image and to develop environmental consciousness. These results are consistent with the study of (Ferreira Alcina Gaspar, 2021) and (Hameed, 2018). These results reveal that eco-labels enhance brand reputation and image positivity.

When it comes to intention to purchase, It can also be shown that knowledge of relevant ecolabels can help consumers distinguish between environmentally friendly and regular products when making purchasing decisions as shown by (Rashid, 2009), and (Kumar, 2021) when concluded that consumers are aware of green products, have a positive attitude towards it and show intention to make responsible purchases to protect the environment. This advantage is said to allow manufacturers to achieve higher sales than their competitors, resulting in higher profits and, in turn, direct financial benefits. Therefore, the ecolabel system provides financial incentives to manufacturers. (Gertz, 2005).

The results of this study demonstrate that Algerian consumers' attitudes towards environmentally friendly products have a significant impact on their willingness to pay a premium for Bebem Natural diapers. Also, the consumers are willing to pay more for products that offer perceived benefits, such as improved quality and health for their children. This is consistent with previous research (Prieto-Sandoval, 2016 ; Sörqvist, 2015), which highlights the importance of environmental considerations in consumer purchasing decisions. Overall, the results of this study provide evidence that environmentally friendly products that demonstrate this through labeling create additional value for consumers, which is reflected in their willingness to pay a premium.

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 WTPM for environmentally friendly products. Specifically, our results confirm that consumer attitudes towards environmentally friendly products, enhance trust in certified brands such as Bebem Natural, and shape perceptions of brand image. 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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