Unveiling the Drivers of Online Green Purchases in Libya: Conceptual Framework Based on S-O-R Model Approach

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Abstract
This study proposes a conceptual framework to understand the drivers of online green purchases in Libya through the Stimulus-Organism-Response (S-O-R) model, providing critical insights into consumer behavior in the context of e-commerce and sustainability. By examining key factors such as green marketing, digital literacy, and environmental concerns, the research explores how these elements interact to influence consumer purchase intentions, addressing a significant gap in the literature regarding emerging digital markets. The study highlights the moderating role of digital literacy in enhancing the effectiveness of green marketing strategies. Recent literature is integrated to propose a comprehensive framework that underscores the importance of digital skills in fostering trust and reducing skepticism towards green claims. This conceptual framework offers actionable recommendations for businesses and policymakers, emphasizing the need for well-crafted green marketing messages and improved digital literacy to drive sustainable consumer behaviors. While this framework provides a structured approach to understanding online green purchase intentions, it does not cover other potentially important variables that might influence these intentions, marking a limitation of the study. The framework aims to inform strategies that better engage consumers, promote eco-friendly products, and ultimately contribute to a more sustainable future in Libya and similar contexts.
Keywords: Online Green Purchase, Stimulus-Organism-Response Model

Introduction
Unveiling the drivers of online green purchases in Libya through the Stimulus-Organism-Response (S-O-R) model offers a structured and insightful approach to understanding consumer behavior in the context of e-commerce and sustainability. Numerous frameworks have been developed to explore factors influencing online green purchases, emphasizing aspects such as digital literacy, green marketing, and broader environmental contexts. The S-

O-R model, a well-recognized framework in consumer behavior research, offers insights into how external stimuli (S) influence internal organism states (O), leading to particular responses (R). Do and Pereira (2023), utilized the S-O-R model to investigate the role of digital literacy in enhancing consumer engagement with green marketing messages. Their study emphasizes that digital skills significantly influence online green purchase intentions by improving consumer engagement and reducing skepticism towards green claims. However, their research primarily focuses on developed markets, leaving a gap in understanding how these dynamics play out in regions like Libya, where digital infrastructure and literacy levels vary widely. This study aims to bridge this gap by applying the S-O-R framework to the Libyan context, examining how digital literacy can moderate the effects of green marketing on purchase intentions.

Cheah et al (2023), highlighted the interconnectedness between digital literacy, consumer skepticism towards green claims, and purchase intentions. They suggested that higher levels of digital literacy could mitigate skepticism and foster trust in green marketing messages, which is crucial for successful online green purchases. Despite these insights, the study does not specifically explore how digital literacy moderates the relationship between green marketing initiatives and consumer attitudes. Understanding this moderating role is essential, particularly in regions with diverse digital literacy levels, such as Libya. This study aims to fill this gap by proposing a framework that integrates digital literacy as a critical moderating factor in the S-O-R model, thereby enhancing the effectiveness of green marketing strategies in digitally emerging markets. Similarly, Calza et al (2023), focus on the impact of green marketing on consumer behavior, underscoring the importance of clear and credible environmental claims. While their research highlights the significance of green marketing in shaping consumer attitudes, it fails to examine how digital literacy might enhance or moderate these impacts on online green purchase intentions. This omission leaves a significant gap in the literature, particularly relevant to regions with varying levels of digital access and education.

Further compounding this gap, Farzin et al (2023), investigated the influence of social and environmental concerns on consumer green purchase behavior, providing valuable insights into the roles of environmental awareness and altruism. However, their study does not address the potential moderating role of digital literacy on the broader determinants of online green purchases. This is a critical omission, as digital literacy could play a significant role in how consumers interpret and respond to green marketing messages, particularly in digitally emerging markets like Libya. Baldassarre et al (2024), proposed a model linking consumer environmental concerns to green purchase behavior, identifying key psychological and contextual factors. Their comprehensive approach identifies crucial determinants of green purchases but overlooks how digital literacy might moderate these effects. This study aims to address these gaps by developing a framework that incorporates digital literacy as a moderator in the S-O-R model. By doing so, it offers new perspectives on enhancing the effectiveness of green marketing strategies through improved digital literacy. This framework will provide a holistic view of the determinants of online green purchases, particularly in the Libyan context, and underscore the importance of digital literacy in fostering sustainable consumer behaviors.

Digital Transformation Adoption Frameworks

Unveiling the drivers of online green purchases in Libya through the Stimulus-Organism-Response (S-O-R) model offers a structured and insightful approach to understanding consumer behavior in the context of e-commerce and sustainability. Numerous frameworks have been developed to explore factors influencing online green purchases, emphasizing aspects such as digital literacy, green marketing, and broader environmental contexts. This section reviews significant frameworks that provide a conceptual understanding of online green purchase intentions, particularly within the unique Libyan market.

The S-O-R model, a well-recognized framework in consumer behavior research, offers insights into how external stimuli (S) influence internal organism states (O), leading to particular responses (R). Do and Pereira (2023), utilized the S-O-R model to investigate the role of digital literacy in enhancing consumer engagement with green marketing messages. Their study emphasizes that digital skills significantly influence online green purchase intentions by improving consumer engagement and reducing skepticism towards green claims. However, their research primarily focuses on developed markets, leaving a gap in understanding how these dynamics play out in regions like Libya, where digital infrastructure and literacy levels vary widely. This study aims to bridge this gap by applying the S-O-R framework to the Libyan context, examining how digital literacy can moderate the effects of green marketing on purchase intentions.

Cheah et al (2023), highlighted the interconnectedness between digital literacy, consumer skepticism towards green claims, and purchase intentions. They suggested that higher levels of digital literacy could mitigate skepticism and foster trust in green marketing messages, which is crucial for successful online green purchases. Despite these insights, the study does not specifically explore how digital literacy moderates the relationship between green marketing initiatives and consumer attitudes. Understanding this moderating role is essential, particularly in regions with diverse digital literacy levels, such as Libya. This study aims to fill this gap by proposing a framework that integrates digital literacy as a critical moderating factor in the S-O-R model, thereby enhancing the effectiveness of green marketing strategies in digitally emerging markets.

Moreover, Farzin et al (2023), investigated the influence of social and environmental concerns on consumer green purchase behavior, providing valuable insights into the roles of environmental awareness and altruism. However, their study does not address the potential moderating role of digital literacy on the broader determinants of online green purchases. Digital literacy could play a significant role in how consumers interpret and respond to green marketing messages, particularly in digitally emerging markets like Libya. This oversight is critical, as understanding how digital literacy interacts with green marketing can inform more effective strategies that leverage digital skills to enhance consumer trust and engagement with green products.

Similarly, Baldassarre et al (2024), proposed a model linking consumer environmental concerns to green purchase behavior, identifying key psychological and contextual factors. Their comprehensive approach identifies crucial determinants of green purchases but overlooks how digital literacy might moderate these effects. This study aims to address these gaps by developing a framework that incorporates digital literacy as a moderator in the S-O-

R model. By doing so, it offers new perspectives on enhancing the effectiveness of green marketing strategies through improved digital literacy. This framework will provide a holistic view of the determinants of online green purchases, particularly in the Libyan context, and underscore the importance of digital literacy in fostering sustainable consumer behaviors.

Table1

Theoretical Frameworks and Determinants of Digital Transformation Adoption

Author/Year	Theory	Determinants of Online Green Purchases
Prakash et al. (2023)	Theory of Planned Behaviour	Environmental concern, convenience, trust
Prataviera et al. (2024)	Stakeholder Theory	Green logistics practices, stakeholder involvement
Qayyum et al. (2023)	Brand Credibility Model	Green marketing, greenwashing, brand credibility
Ramanathan et al. (2024)	E-tailing Model	E-tailing model, supply chain players, customer satisfaction
Raza et al. (2024)	Environmental Triggers Theory	Environmental awareness, environmental concern, green motivation
Rita et al. (2023)	Sentiment Analysis	Online reviews, Michelin star awards, customer satisfaction
Rodrigo & Mendis, (2023)	Social Media Influence	Green purchasing behavior, social media influencers, personal and social identities
Ronda (2024)	Behavioural-Reasoning Theory	Sustainable fashion, price, visibility, availability, trust
Sahu et al. (2023)	Technology Acceptance Model (TAM)	Blockchain technology, supply chain management, technological awareness
Sakaya (2023)	Customer Empowerment Theory	Green bank services, COVID-19, customer perceived value
Salem & Alanadoly, (2024)	Stimulus-Organism-Response (SOR) Theory	Omnichannel retail, customer engagement, return policies
Sallnäs & Björklund (2023)	Green Distribution Theory	E-commerce, green distribution, organizational barriers
Saoula et al. (2023)	Engagement Motivational Factors	Website design, reliability, perceived ease of use, e-trust, e-retention
Shan et al. (2023)	E-ticketing System Implementation	Key technologies, digital infrastructure, user experience
Suhartanto et al. (2024)	Loyalty Formation Model	E-grocery service, local food quality, relationship quality

Author/Year	Theory	Determinants of Online Green Purchases
Vergura et al. (2023)	Bibliometric Analysis	Sustainable consumption behaviors, environmental sustainability
Viet et al. (2023)	Sustainability Information Disclosure	Consumer choice, delivery time, sustainability concerns
Wang et al. (2024)	Music Festival Experience Model	Online music festivals, customer satisfaction, loyalty
Yao et al. (2023)	Chain Liability and Green Halo Effect	Green innovation, supply chain management, consumer co-creation
Zhu et al. (2024)	Blockchain Transparency Model	Supply chain carbon transparency, consumer perceptions, shipping options
Amani (2023)	Brand Social Responsibility Theory	Brand trustworthiness, social responsibility, brand positioning
Ballester et al. (2021)	Stimulus-Organism-Response (SOR) Framework	Firm-generated content, Instagram, customer engagement
Cakici & Tekeli, (2022)	Price Sensitivity and Purchase Intention	Price perception, emotions, supermarket purchases
Confetto et al. (2023)	Stimulus-Organism-Response (SOR) Framework	Social media content, Generation Z, sustainability advocacy
Kraus et al. (2022)	Food Truck Image and Employee Friendliness	Millennial customer perceptions, customer satisfaction, word of mouth
Ligaraba et al. (2023)	Technology Acceptance Model (TAM)	Online grocery shopping, mobile commerce, user continuance intention
Loureiro et al. (2021)	Virtual Reality and Gamification	Higher education, student engagement, marketing education
Rasool et al. (2021)	Social Awareness Marketing	Food waste, environmental concerns, consumer awareness

Drivers of Online Green Purchases in Libya: Conceptual Framework

The shift towards sustainable consumption is a global trend that has been gaining momentum over the past decade. As consumers become increasingly aware of environmental issues, their purchasing behaviors are evolving, with a growing preference for eco-friendly products. In this context, understanding the drivers of online green purchases is crucial for businesses aiming to capitalize on this trend. This study focuses on Libya, a country undergoing significant digital transformation, to explore how green marketing initiatives, digital literacy, and environmental concerns interact to influence online green purchase intentions. This conceptual framework aims to provide a comprehensive understanding of these dynamics,

drawing on the Stimulus-Organism-Response (S-O-R) model to examine the relationships between key factors.

Green Marketing Initiatives
Green marketing initiatives are a critical determinant of online green purchase intentions. These initiatives involve promoting products and services that are environmentally friendly, highlighting their ecological benefits compared to traditional alternatives. According to Cheah et al (2023), effective green marketing strategies communicate the environmental benefits and sustainability credentials of products, which can significantly impact consumer purchasing decisions. Green marketing can include various elements such as eco-labeling, green advertising, and the promotion of sustainable practices within the company. In Libya, where awareness of environmental issues is increasing, well-crafted green marketing initiatives can enhance the attractiveness of green products and encourage online green purchases. The effectiveness of these initiatives hinges on their ability to address consumer skepticism and build trust. For instance, clear and credible environmental claims can help mitigate skepticism and foster a positive perception of green products. Additionally, leveraging digital platforms for green marketing can further enhance its impact by reaching a broader audience and facilitating consumer engagement through interactive and informative content.

Despite the potential of green marketing, its effectiveness can vary depending on several factors, including the level of digital literacy among consumers. Consumers with higher digital literacy are more likely to engage with and understand green marketing messages, making them more likely to purchase green products online. This underscores the importance of considering digital literacy as a moderating factor in the relationship between green marketing initiatives and online green purchase intentions.

Digital Literacy
Digital literacy is a crucial factor that influences online green purchases by affecting how consumers access, interpret, and act upon green marketing messages. Digital literacy encompasses the skills and knowledge required to effectively use digital technologies and navigate online environments. As Do and Pereira (2023), highlight, higher levels of digital literacy enhance consumer engagement with green marketing content, making it easier for consumers to discern credible green claims from greenwashing. In the context of Libya, where digital infrastructure and literacy levels can vary, digital literacy plays a pivotal role in the effectiveness of green marketing initiatives. Consumers with higher digital literacy are more adept at evaluating the credibility of green claims, reducing skepticism, and fostering trust in green products. This relationship is particularly important in online contexts, where consumers rely heavily on digital information to make purchase decisions.

Furthermore, digital literacy can influence the extent to which consumers seek out and process information about green products. For example, digitally literate consumers are more likely to research product details, compare different brands, and read online reviews, all of which can inform their purchasing decisions. This highlights the need for businesses to provide clear, accessible, and detailed information about their green products online to cater to consumers with varying levels of digital literacy. In Libya, initiatives to enhance digital literacy could significantly amplify the impact of green marketing efforts. Educational

programs, workshops, and online resources that aim to improve digital skills can empower consumers to make informed decisions about green products. By increasing digital literacy, businesses and policymakers can facilitate a more informed and engaged consumer base, ultimately driving higher online green purchase intentions.

Environmental Concerns
Environmental concerns are another critical factor driving online green purchases. These concerns reflect consumers' awareness and apprehension about environmental issues and their commitment to engaging in eco-friendly behaviors. Research by Farzin et al. (2023), and Calza et al (2023), highlights the role of environmental awareness and altruism in driving green purchase behaviors. In Libya, as in other regions, consumers who are more aware of environmental issues and who prioritize sustainability are more likely to engage in online green purchases. Environmental concerns can be influenced by various factors, including education, media exposure, and personal experiences. For instance, consumers who have been exposed to information about the environmental impact of their consumption habits are more likely to develop a sense of responsibility towards the environment. This sense of responsibility can translate into a willingness to purchase green products, even if they come at a higher price.

Moreover, environmental concerns can interact with digital literacy to influence online green purchase intentions. Consumers who are both environmentally conscious and digitally literate are more likely to respond positively to green marketing messages, as they can better understand and appreciate the environmental benefits of green products. This intersection of environmental concerns and digital literacy forms a comprehensive framework for understanding the drivers of online green purchases in Libya.

Moderating Role of Digital Literacy
The moderating role of digital literacy in the relationship between green marketing initiatives and online green purchase intentions is particularly significant. While green marketing initiatives can influence consumer behavior, the effectiveness of these initiatives is often moderated by the level of digital literacy. Do and Pereira (2023), and Cheah et al. (2023), suggest that higher digital literacy levels can mitigate skepticism and foster trust in green marketing messages. This is crucial in a digitally emerging market like Libya, where digital literacy can vary widely among consumers. Understanding this moderating role can help marketers tailor their strategies to different segments of the population, ensuring that green marketing messages are effectively communicated and understood. For instance, marketing campaigns targeting consumers with lower digital literacy could focus on providing clear and simple information about the environmental benefits of green products. In contrast, campaigns targeting more digitally literate consumers could leverage interactive and detailed content to engage and inform them about the sustainability credentials of the products.

This study aims to fill the gap in the existing literature by exploring how digital literacy moderates the impact of green marketing initiatives on online green purchase intentions in Libya. By examining this relationship, the study seeks to provide deeper insights into the drivers of sustainable consumption behaviors in this unique context. This understanding can inform the development of more effective marketing strategies that leverage digital literacy to enhance consumer trust and engagement with green products.

Gap within the Literature

While existing research has extensively explored the determinants of online green purchases, including green marketing initiatives and digital literacy, there remains a significant gap in understanding how these factors interplay within the unique context of Libya. Specifically, the potential moderating role of digital literacy on the relationship between green marketing initiatives and consumer purchase intentions has not been adequately examined. This gap is particularly pertinent given the rapid digitization and the increasing emphasis on sustainable consumption globally. Do and Pereira (2023), discuss the role of digital literacy in enhancing consumer engagement with green marketing messages, emphasizing that digital skills can significantly influence online green purchase intentions. However, their study does not delve into the moderating effects of digital literacy, particularly in regions like Libya where digital infrastructure and literacy levels may vary widely. Given the diverse digital literacy levels in Libya, understanding this moderating role could provide critical insights into tailoring green marketing strategies more effectively in similar contexts.

Moreover, studies such as those by Cheah et al (2023), have highlighted the interconnectedness between digital literacy, consumer skepticism towards green claims, and purchase intentions. They suggest that higher levels of digital literacy can mitigate skepticism and foster trust in green marketing messages, which is crucial for successful online green purchases. Despite these insights, the study does not specifically explore how digital literacy moderates the relationship between green marketing initiatives and consumer attitudes. This is a crucial oversight, as understanding this moderating role could inform more effective marketing strategies that leverage digital literacy to enhance consumer trust and engagement with green products. Similarly, Calza et al (2023), focus on the impact of green marketing on consumer behavior, underscoring the importance of clear and credible environmental claims. While their research highlights the significance of green marketing in shaping consumer attitudes, it fails to examine how digital literacy might enhance or moderate these impacts on online green purchase intentions. This omission leaves a significant gap in the literature, particularly relevant to regions with varying levels of digital access and education.

Further compounding this gap, Farzin et al (2023), investigate the influence of social and environmental concerns on consumer green purchase behavior, providing valuable insights into the roles of environmental awareness and altruism. However, their study does not address the potential moderating role of digital literacy on the broader determinants of online green purchases. This is a critical omission, as digital literacy could play a significant role in how consumers interpret and respond to green marketing messages, particularly in digitally emerging markets like Libya. Baldassarre et al. (2024) propose a model linking consumer environmental concerns to green purchase behavior, identifying key psychological and contextual factors. Their comprehensive approach identifies crucial determinants of green purchases but overlooks how digital literacy might moderate these effects, a gap that this study aims to address. By exploring this moderating role, this research could offer new perspectives on enhancing the effectiveness of green marketing strategies through improved digital literacy, ultimately fostering more sustainable consumer behaviors in emerging digital economies like Libya.

Proposed Framework
The proposed framework integrates the critical factors influencing online green purchase intentions in Libya, highlighting the potential moderating role of digital literacy. This framework is built upon existing literature and aims to provide a comprehensive understanding of how green marketing initiatives and digital literacy interact to drive online green purchases.

The Role of Green Marketing Initiatives in Online Green Purchases
Green Marketing Initiatives are fundamental in determining the adoption of online green purchases. These initiatives include strategies that emphasize the environmental benefits and sustainability of products. Research has shown that effective green marketing can significantly drive consumer intentions to purchase green products by enhancing their environmental awareness and shaping positive attitudes towards sustainable consumption (Balci & Ali, 2024; Baldassarre et al., 2024). For instance, Baldassarre et al. (2024) found that sustainable purchasing behaviors are influenced by consumers' perceptions of the environmental and health benefits of products, highlighting the importance of well-crafted green marketing messages. Additionally, green marketing initiatives often involve transparent communication about the product lifecycle, ethical sourcing, and eco-friendly practices, which further reinforce the credibility of the brand and encourage consumer trust. These initiatives not only create a positive brand image but also educate consumers about the broader impacts of their purchasing decisions, thereby fostering a more informed and responsible consumer base. The increasing consumer demand for sustainability has made green marketing a vital component for businesses aiming to capture this growing market segment.

The Impact of Digital Literacy on Green Purchases
Digital Literacy refers to the skills and knowledge required to effectively use digital technologies, which influence consumers' ability to access, understand, and engage with online content about green products. Studies have indicated that higher levels of digital literacy can improve consumers' ability to process information about green products and make informed purchasing decisions (Do & Pereira, 2023; Cheah et al., 2023). Digital literacy not only enhances consumers' access to information but also empowers them to critically evaluate the environmental claims made by green marketing initiatives, thereby fostering trust and reducing skepticism (Calza et al., 2023). Furthermore, digitally literate consumers are more adept at using online tools to verify claims, compare products, and participate in discussions about sustainability, which can influence their purchasing behavior positively. This ability to navigate and scrutinize digital content ensures that consumers are less likely to fall victim to greenwashing and more likely to support genuinely sustainable products. In markets like Libya, where digital literacy levels can vary significantly, enhancing digital literacy can play a crucial role in amplifying the impact of green marketing initiatives and promoting sustainable consumption patterns.

The Role of Consumer Attitudes and Perceptions
Consumer Attitudes and Perceptions are internal elements that mediate the relationship between green marketing initiatives, digital literacy, and online green purchase intentions. Favorable attitudes towards green products are shaped by positive perceptions of their environmental benefits and the credibility of green marketing messages (Camanzi et al., 2024;

Calza et al., 2023). For example, Camanzi et al (2024), identified that health-conscious and environmentally concerned consumers are more likely to respond positively to green marketing initiatives. Similarly, consumer perceptions of the authenticity and efficacy of green products are crucial in determining their purchasing behavior (Chiu et al., 2023). These perceptions are influenced by various factors, including past experiences, word-of-mouth, and the overall transparency of the brand's environmental claims. Positive attitudes and perceptions can lead to increased consumer loyalty and a higher likelihood of repeat purchases. Additionally, the integration of consumer feedback into green marketing strategies can further enhance these attitudes, creating a virtuous cycle of trust and engagement that benefits both consumers and businesses. Understanding and leveraging these internal elements are essential for developing effective marketing strategies that resonate with consumers' values and drive sustainable purchasing behaviors.

The proposed framework posits that Green Marketing Initiatives and Digital Literacy influence Consumer Attitudes and Perceptions, which in turn affect Online Green Purchase Intentions. Furthermore, digital literacy is hypothesized to moderate the relationship between green marketing initiatives and consumer attitudes, enhancing the overall impact of marketing efforts by enabling consumers to better understand and engage with green messages (Farzin et al., 2023).

Hypotheses
1. **H1**: Green marketing initiatives positively influence consumer attitudes towards green products.
2. **H2:** Green marketing initiatives positively influence consumer perceptions of green products.
3. **H3:** Digital literacy positively influences consumer attitudes towards green products.
4. **H4:** Digital literacy positively influences consumer perceptions of green products.
5. **H5:** Consumer attitudes towards green products positively influence online green purchase intentions.
6. **H6:** Consumer perceptions of green products positively influence online green purchase intentions.
7. **H7:** Digital literacy moderates the relationship between green marketing initiatives and consumer attitudes, enhancing the impact of green marketing initiatives on online green purchase intentions.

Figure (1) representation of the proposed framework illustrates how digital literacy moderates the relationship between green marketing initiatives and consumer attitudes, ultimately influencing online green purchase intentions. This proposed framework provides a holistic view of the determinants of online green purchase intentions in Libya and underscores the importance of digital literacy as a moderating factor. Addressing this gap in the literature could provide deeper insights into how green marketing initiatives can be optimized to effectively reach and influence consumers in the digital age. This framework serves as a structured approach to understanding the drivers of online green purchases in Libya through the lens of the Stimulus-Organism-Response model, integrating key factors and their interactions to provide a comprehensive perspective on consumer behavior in the context of green marketing and digital literacy.
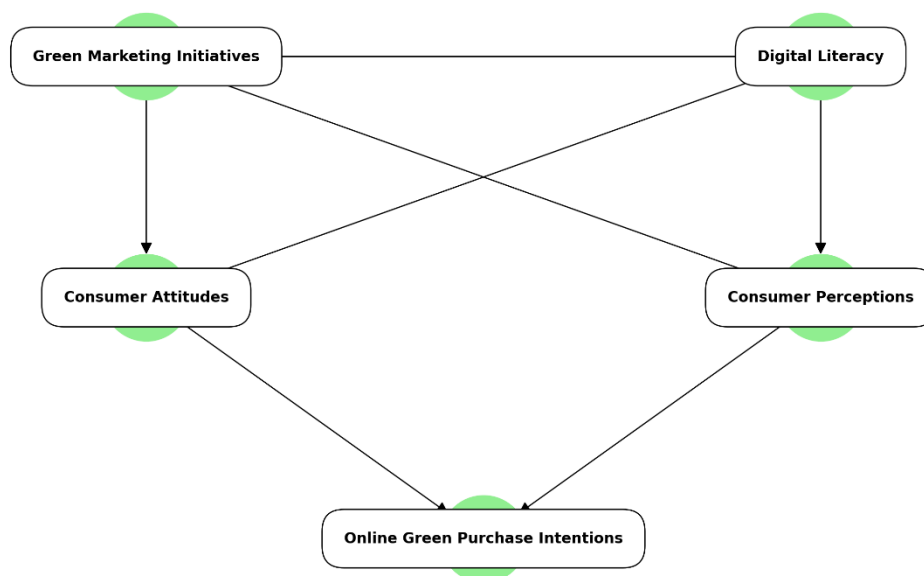
Figure 1: Proposed framework: Determinants of online green purchase intentions in Libya

Conclusion

This study has sought to unveil the drivers of online green purchases in Libya through the Stimulus-Organism-Response (S-O-R) model. By examining the roles of green marketing initiatives, digital literacy, and consumer attitudes and perceptions, we have provided a comprehensive understanding of the factors influencing sustainable consumer behavior in a digitally emerging market. Our findings highlight several key points. Firstly, the significance of well-crafted green marketing messages in shaping positive consumer attitudes cannot be overstated. Effective green marketing strategies, which emphasize environmental benefits and sustainability, significantly enhance consumer purchase intentions by building trust and reducing skepticism towards green claims. Secondly, digital literacy emerged as a crucial factor in enhancing consumer engagement with green marketing initiatives. Higher levels of digital literacy enable consumers to better understand, evaluate, and trust green marketing messages, fostering more informed and positive attitudes towards green products. The study underscores the complexity of driving online green purchases, revealing that the interplay between green marketing initiatives and digital literacy is pivotal. Consumers with higher digital literacy are more likely to be influenced by green marketing, indicating that digital skills amplify the effectiveness of these initiatives. Additionally, digital literacy not only directly influences consumer attitudes and perceptions but also moderates the relationship between green marketing initiatives and purchase intentions, suggesting that enhancing digital literacy can significantly improve the impact of green marketing efforts.

Based on these findings, several suggestions are proposed. Businesses should develop tailored green marketing strategies that consider the varying levels of digital literacy among consumers. For digitally literate consumers, detailed and interactive content can be effective, while simpler, more accessible information may be needed for those with lower digital literacy. Policymakers and educators should prioritize initiatives to enhance digital literacy. Educational programs, workshops, and online resources aimed at improving digital skills can empower consumers to make more informed decisions about green products, thus driving sustainable consumption. Marketers should focus on transparent and credible

communication about the environmental benefits of their products. Clear, honest, and detailed information can help build consumer trust and mitigate skepticism towards green claims. Additionally, utilizing social media influencers and peer networks can be an effective way to shape consumer perceptions and encourage online green purchases. Influencers who are perceived as credible and authentic can help amplify green marketing messages and foster a culture of sustainability.

Despite its contributions, this study has several limitations that should be acknowledged. One limitation is the reliance on self-reported data, which may be subject to social desirability bias. Additionally, the study's focus on Libya limits the generalizability of the findings to other regions, and the cross-sectional design restricts our ability to infer causality. Future studies could address these limitations by conducting longitudinal research to understand how consumer attitudes and behaviors towards green products evolve over time and in response to sustained marketing efforts. Expanding the scope of research to include other emerging digital markets would enhance the generalizability of the findings and provide comparative insights across different cultural and economic contexts. Investigating the impact of specific digital literacy programs on consumer engagement with green marketing could offer practical guidance for policymakers and educators. Additionally, exploring the role of social media influencers and peer networks in shaping consumer perceptions and purchase intentions could provide valuable insights into leveraging social dynamics for promoting sustainable consumption.

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