Review

Digital Innovation and Sustainability Driven Consumer Behavior: A Review and Research Agenda

Manu Sharma , Janmejai Shah , Sudhanshu Joshi * , Adel Ben Youssef , Abhishek Misra

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Article

Digital Innovation and Sustainability Driven Consumer Behavior: A Review and Research Agenda

Manu Sharma [1,2], Janmejai Kumar Shah [1], Sudhanshu Joshi [2,3], Adel Ben Youssef [4] and Abhishek Misra [1]

[1] Department of Management Studies, Graphic Era Deemed to be University, Dehradun 248002, India; manu.sharma@geu.ac.in
[2] Australian Artificial Intelligence Institute (AAII), University of Technology Sydney, Sidney 2007, Australia; sudhanshu.joshi@uts.edu.au
[3] PM Gati Shakti Centre of Excellence in Logistics and Supply Chain Management, School of Management, Doon University, Dehradun 248001, India; sudhanshujoshi@doonuniversity.ac.in
[4] GREDEG CNRS, University Côte d'Azur, 20 avenue Valrose,Nice, France, E-mail: adel.ben-youssef@gredeg.cnrs.fr
* Correspondence: sudhanshujoshi@doonuniversity.ac.in; Tel.: +91-9997410336

Abstract: Consumption is thus fundamentally related to sustainably because every decision pertaining to what to buy, what quantity the buy, how many to consume, or how to dispose of things has a direct influence on the natural world and the generations to come, and the overall impact of every single the customer's purchase is disastrous. A framework-based systematic literature review (SLR) was conducted to better comprehend the body of research on digital innovation and sustainability driving consumer behavior. This was done in order to acquire a deeper understanding of the studies that have already been done in this area. to provide (i) a comprehensive review of the current research landscape and (ii) a rich roadmap for future research. This study evaluated the literature especially in terms of theory, context, traits, and methodology. A total of 107 research articles published between 2013 and 2022 were found using scientific methods in the Scopus database. The findings showed that most research appears to have employed qualitative methodologies and was grounded in the setting of China and Italy. This review could help scholars better grasp the relationship between digital innovation and sustainability, opening the door for additional study and advancement in the field. Additionally, by extending the literature study and emphasizing the elements that can improve digital innovation and sustainability, practitioners will be given a better overall understanding of how to approach the problem.

Keywords: digital innovation; sustainability; TCCM; consumer behavior; SPAR-4-SLR; systematic literature review

1. Introduction

Digital innovation and sustainability are interconnected drivers of consumer behavior. Digital platforms provide access to information, promote transparency, and enable convenient and sustainable choices. The powerful of online communities further amplifies the impact of sustainability-related content. As consumers become more aware and concerned about environmental and social issues, they are increasingly inclined to make sustainable choices, driving companies to adopt more sustainable practices and products. In almost every industry, innovation is turning into a major battleground for competition. Businesses are under increasing pressure to innovate continuously and roll out new goods and services at an accelerated rate. When the next thing is not the next big thing, consumers are disappointed and don't try to conceal it. Companies are realising that conventional methods of innovation, such as internal product development, focus groups, and market research to assess viability and market potential, don't always accurately reflect the demands and preferences of customers. Consumer innovation refers to the development and

introduction of new products, services, and business models that enhance the consumer experience. It involves creating innovative solutions to meet consumer demands, improve convenience, and provide value. When applied through the lens of sustainability, consumer innovation focuses on minimizing the negative environmental and social impacts associated with consumption. Consumer innovation and sustainability are two interconnected concepts that play a crucial role in addressing environmental and social challenges while meeting the needs and desires of consumers. Consumer innovation and sustainability are not only about reducing negative impacts but also creating positive change. By providing consumers with sustainable alternatives, innovative products and services can inspire and empower individuals to make choices that contribute to a more sustainable future. Companies, governments, and organizations play a vital role in driving consumer innovation for sustainability. By investing in research and development, promoting sustainable business practices, and collaborating with consumers, they can accelerate the transition toward a more sustainable and responsible consumption ecosystem [1]. There is broad agreement that developing innovative sustainable products is essential for addressing sustainability issues. The majority of individuals want to live in a way and do actions that satisfy their immediate needs without having a harmful influence on the environment. Environmental or sustainable behavior is best defined by its impact: the amount to which decisions is motivated by a desire to benefit or minimize the impact on the environment [2]. Nonetheless, most, if not all, people engage in behaviors that have a negative impact on the environment. Consumer behaviour, purchasing patterns, and living standards are all influenced by innovations. In the age of fierce competition, the only way for businesses to not only survive but also gain a competitive advantage is through innovation. This is why businesses, particularly high-tech enterprises, spend billions of dollars each year on research and development (R&D) and the development of new goods and services in response to changing client demands and demand [3].The entire world is confronting several sustainability problems, the most of which are caused by humans. As an instance, the incidence of catastrophic events has risen considerably, and weather patterns have shifted dramatically. The trends are clear, glaciers are disappearing, and temperatures worldwide are rising, mostly due to greenhouse gas emissions emitted. Carbon monoxide, methane, and nitrogen oxides are the most common greenhouse gases. Through deforestation, growth in population, producing goods, auto greenhouse gases, and the use of petroleum and natural gas, humans are raising carbon dioxide concentrations significantly, material degradation in dumps increases the amount of methane which has harmful effects. Because of greenhouse gas emissions, humans are producing global sustainability issues such as catastrophic catastrophes, climatic changes, and rising temperatures. Sustainable product innovation is critical to addressing sustainability issues, innovation influences buyer behaviour, buying patterns, and quality of life, and firms invest lot in R&D and the creation of new goods and services to meet changing client expectations [4]. Customer behaviour is an examination of people, groups, or institutions and the procedures they use to select, obtain, and disposed of goods, offerings, situations, or ideas to meet requirements. It blends components and economics to comprehend the consumer's process of decision-making. Previous studies [5–9] filled gaps in research by defining eco-sustainable buyer behaviour, reviewing both social and ecological psychological theories, discussing key drivers of eco-sustainable consumer conduct, and introducing new innovations on sustainability and consumer behavior. These studies provide opportunities viewpoint on ecological innovation s to explain how various aspects. This study should address the gap by relationship between the consumer innovations and sustainability, the rate of adoption, and the change in consumer behaviour. This research examines consumer habits and the interactions among customers and companies in the innovative setting in order to achieve sustainability. Based on this, the developed research questions are as follows:

RQ1: ***What are the publication characteristics, content structure, and implications of consumer behavior driven by digital innovation and sustainability?***

RQ2: ***How is our understanding of consumer behavior driven by digital innovation and sustainability advanced within the academic sphere?***

RQ3: ***What are the prospective research avenues for exploring digital innovation and sustainability-driven consumer behavior in the future?***

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This study has filled the gap to elaborate the consumer innovation and sustainability relationship using systematic literature review, bibliometric analysis, network analysis, and thematic analysis of published literature. The process began with setting the study objectives followed by the first stage evaluation included database selection, keyword selection, and the application of inclusion-exclusion criteria. Following the first stage of review, a second stage of short listing is completed. The review process continues with review analysis and bibliometric, network, and thematic analysis. Finally, the study findings and conclusions, as well as the consequences and future research directions, were derived. This paper is organised into six sections: Section 1 provides an introduction to the subject. Section 2 discusses systematic literature review and methodology. The bibliometric study is included in Section 3. The network analysis is included in Section 4. Section 5 comprises thematic analysis, discussion, and implications. Finally, Section 6 provides the study results, limitations, and recommendations for further research in this field.

2. Methodology

Depending on the goal of the study, systematic literature review (SLR) has been approached. The following are preferred formats: theme-based, theory-based, bibliometric analysis, and meta-analysis. Finding relevant research problem(s) and selecting and critically analysing them using SLR results in the identification of knowledge gaps and future directions. Bibliometric analysis is used to investigate the overall influence of their field, a group of scholars, or a specific work inside a certain field of research. The citation graph, a network containing the citations of distinct papers is employed in the current study to analyse quantitatively citation scientific articles. The scientific procedures and rationales for SLR (SPAR-4-SLR) approach was used to create a collection of papers. This methodology has been shown to be particularly beneficial in assisting researchers in understanding the multiple decisions faced in SLR and in offering clear guidelines for constructing robust and transparent review. When employing the SPAR-4-SLR protocol to deliver deeper state-of-the-art insights, three key steps were included: (i) gathering, (ii) organizing, and (iii) evaluating. Using the TCCM framework created by Paul and Rosado-Serrano, we follow a framework-based review to address the proposed RQs of this study. The steps are summarised in Figure 1.

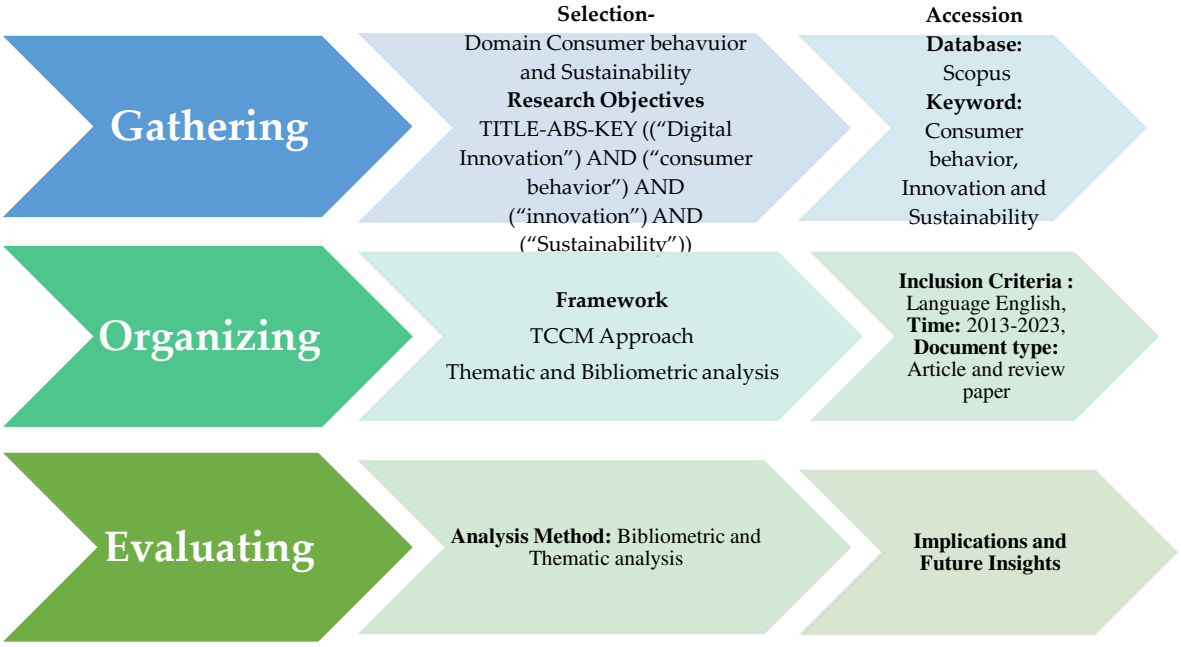

Figure 1. Methodology.

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2.1. Gathering

The stages of selection and accession make up the gathering stage. During the selection stage, decisions were made regarding the study environment, research objectives, source type, and source quality. Only rigorously peer-reviewed academic journals and review papers were considered for additional evaluation, while other publications such as conference papers, book chapters were eliminated. The Scopus index was used to filter the quality of journal sources. Keyword selection is an important component of article accession in any subject. The following key terms were examined for article gathering in this work: TITLE-ABS-KEY ((“consumer behavior”) AND (“Digital innovation”) AND (“Sustainability”)). As a result, 187 items from Scopus were discovered.

2.2. Organising

The organizing stage includes the process of inclusion and exclusion criteria of documents. Inclusion criteria for this study were peer-reviewed publications and review papers. Another inclusion criterion was that the article be written in English. Conferences, book chapters etc. publications published in other languages were all excluded from consideration for this work. In this stage, all papers published between 2013 and 2023 were taken into account, A \as a result, 107 items from Scopus were discovered.

2.3. Evaluating

The included publications were analysed using bibliometric analysis, thematic analysis and guidelines in the final assessment step through TCCM approach. To achieve objectivity Review analysis, as well as bibliometric and thematic analysis, is carried out as part of the review process. Finally, the study's findings and conclusions were determined, as well as the implications and future research prospects.

3. Findings and Analysis

The included papers were categorised and examined using TCCM framework by Paul and Rosado-Serrano's [10] to respond to the first two research questions to respond to the first two research questions, shown in Figure 2

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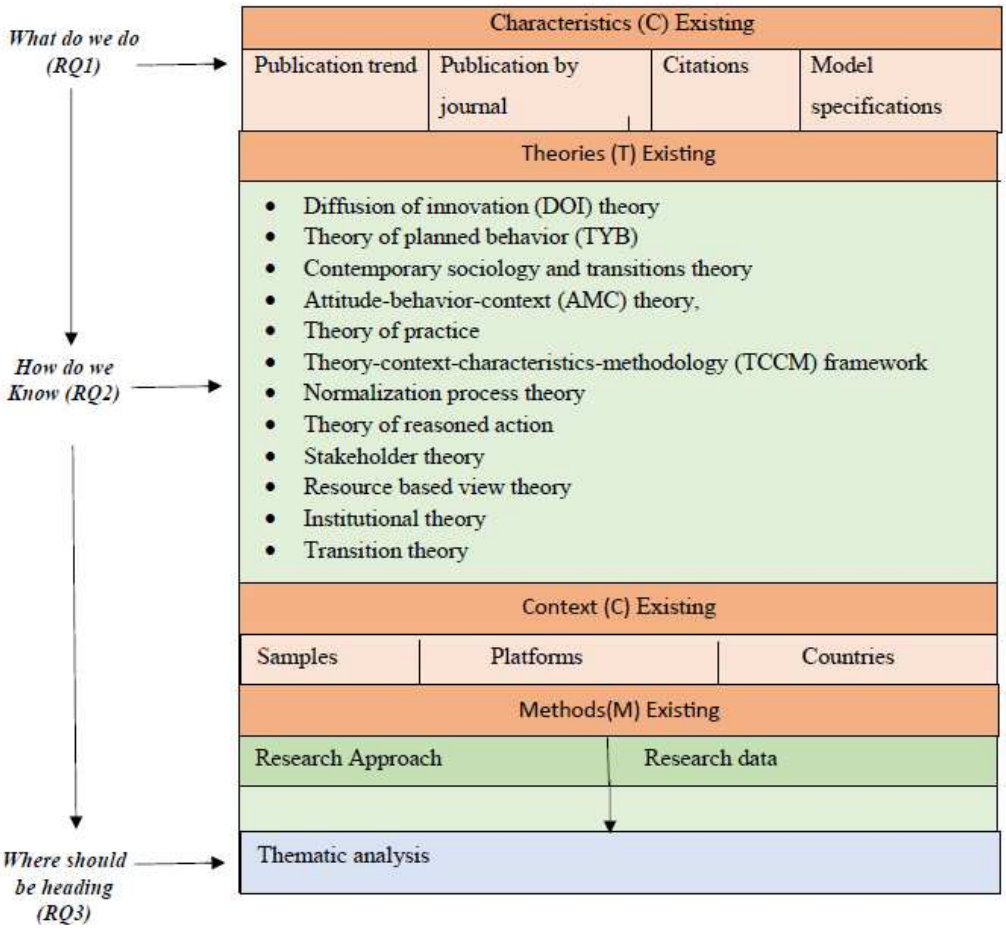

Figure 2. Research Framework (Authors).

3.1. What are the publication characteristics, content structure, and implications of consumer behavior driven by digital innovation and sustainability? (RQ1)

3.1.1. Publishing features and content structure

Figure 4 shows the yearly developments in consumer innovation and sustainability studies from 2013 to 2023. Noteworthy, there increase in interest in this area. This is demonstrated by the apparent increase in research articles produced between 2020 and 2022. Overall, as consumer behavior improved, so did the reporting of consumer innovation.

Table 1 summarizes the 107 publications that were examined for review. Table 1 contains information about the publications that were chosen for investigation. The total number of articles evaluated was 107, with 90 being original papers and 17 being literature reviews. In all, 724 keywords were utilized. It is clear that 377 authors are conducting research in this field, with 10 of them publishing separately. Furthermore, 401 authors collaborated with other authors on papers. Sustainability (Switzerland), Journal of cleaner production, and Technological forecasting and social change are the most relevant journals where these articles are published, with 19, 9, and 5 papers, respectively, as shown in Table 3. The number of selected papers for analysis is specified annually in Table 2. The table shows a remarkable increase in the number of relevant articles. There were 7 in 2018, then increased to 8, 12, 27, and 23 in 2019, 2020, 2021, and 2022, respectively.

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Table 1. Bibliometric analysis of the 107 articles included for the thorough literature review.

Description	Results
Main information about data	
Timespan	2013:2023
Sources (journals, books, etc)	64
Documents	107
Annual growth rate %	0
Document average age	3.45
Average citations per doc	25.13
References	8128
Document contents	
Keywords plus (id)	724
Author's keywords (de)	434
Authors	
Authors	377
Authors of single-authored docs	9
Authors collaboration	
Single-authored docs	10
Co-authors per doc	3.72
International co-authorships %	23.36
Document types	
Article	90
Review	17

Table 2. Publications year -wise.

Year	Articles
2013	6
2014	2
2015	3
2016	9
2017	4
2018	7
2019	8
2020	12
2021	27
2022	23

The SLR also identified the name of the journals where the most articles were published. Table 3 exhibits the list of journals and signifies that 'Sustainability' journal has the highest number of articles (19), publisher MDPI. Based on the cite score, Critical reviews in food science and nutrition has the highest count i.e. 20.8

Publications by journal

According to the statistics, numerous publications have published research on consumer innovation and sustainability (see Table 3)

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Table 3. List of Journals.

Sources	Articles	Publisher	Cite score
Sustainability (Switzerland)	19	MDPI	3.9
Journal of cleaner production	9	Elsevier	13.1
Technological forecasting and social change	5	Elsevier	12.1
International journal of environmental research and public health	4	MDPI	3.4
Sustainable production and consumption	4	Elsevier	7.04
Trends in food science and technology	3	Elsevier	16.7
Appetite	2	Elsevier	
Critical reviews in food science and nutrition	2	Taylor & Francis	20.8
Nutrients	2	MDPI	7.9
Socio-economic planning sciences	2	Elsevier	4.9

Table 4 displays top 15 most important publications based on mention keywords in the Scopus database.

Table 4. Highly cited documents.

Topic	Author	Year	Total Citations	TC per Year
"Sustainable consumption and production for Asia ……. practice"	Tseng et al. [11]	2013	309	28.09
"Innovations and technology disruptions ……..lockdown era"	Galanakis et al.[12]	2021	195	65.00
"Consumers' perception ……. review"	Schleenbecker and Hamm[13]	2013	166	15.09
"Plant-based food ……..the future"	Aschemann-Witzel et al.[14]	2020	146	36.50
"Sustainable sheep ……. dilemmas"	Montossi et al.[15]	2013	111	10.09
"Simulating early adoption …… sustainability"	Tran et al.[16]	2013	95	8.64
"Transforming Consumption:	O'Rourke and Lollo [17]	2015	88	9.78

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……Sustainable Consumption"				
"Food choice motives ……unsustainable concerns"	Baudry et al.[18]	2017	78	11.14
"A Quadruple and …..Bioeconomy"	Grundel and Dahlstram [19]	2016	76	9.50
"Consumers and …. eco-design"	Polizzi et al.[20]	2016	70	8.75

3.1.2. Citation Analysis

The citation analysis results are meant to help researchers find the most cited publications, authors, and journals. Results from the citation analysis are expected to assist scholars in identifying the most cited articles, authors, and journals [21]. Table 4 shows the 10 most influential articles by Google Scholar citations. Google Scholar's global citation provides the citation index on how many times an article is cited by other works in all databases.

3.2. How is our understanding of consumer behavior driven by digital innovation and sustainability advanced within the academic sphere? (RQ2)

Theory, Context, Characteristics, and Methods (TCCM) were the four parts of the review. The first section summarizes commonly used "Theories." The second section is titled "Context," and it assesses the nations studied in past research investigations. The third section is titled "Characteristics," and it analyses the components researched. The fourth section is about methodology and research procedures.

3.2.1. Theories

To effectively understand the phenomenon, consumer behaviour research may be related to several theories and frameworks. A theory is a collection of concepts that have been organized and can be tested through experimentation. As a result, the article mentions that theories give rational explanations for how a collection of constructions link and interact to one other in order to explain or predict occurrences. These theories can be classified into groups based on their similarities in the underlying conceptual the company that is thought to impact the researched outcomes. Many theories were employed to explain consumer behaviour in diverse situations (different nations) in the research articles that were evaluated. Additionally, earlier research papers explored the influence of independent variables, mediating variables, and moderating variables on the outcomes (dependent variables) using a variety of methods. Frameworks have shown to be more organized and appropriate for domain-based evaluations. Because this evaluation was domain-based, the TCCM was deemed to be an appropriate framework that could be utilized often for analysing. As a result, it was selected as the framework for this evaluation.

Table 5. Theories identified in review.

Theory	**Occurrence**	**Sample articles**
Diffusion of innovation (DOI) theory	3	Li et al., [22], Wong et al.,[23], Waheed et al., [24]
Theory of planned behavior (TYB)	3	Li et al., [22], Adnan et al.[25] Moon, 2021 [26]

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Contemporary sociology and transitions theory	1	Crivits and Paredis [27]
Attitude-behavior-context (AMC) theory,	1	Chen et al. [28]
Theory of practice	1	Crivits and Paredis [27]
Theory-context-characteristics-methodology (TCCM) framework	1	Bommanahalli Veerabhadrappa et al.[29]
Normalization process theory	1	Benson [30]
Theory of reasoned action	1	Jain et al. [31]
Stakeholder theory	1	Mylan [32]
Resource based view theory	1	Mylan [32]
Institutional theory	1	Mylan [32]
Transition theory	1	McClellan et al., [33]

The diffusion of innovation and the theory of planned behaviour (3 articles) were the most regularly utilized theories to explain consumer behaviour among the papers analysed. Transitions theory and contemporary sociology theory, The idea of attitude-behavior-context (AMC), Theory of action The framework of theory-context-characteristics-methodology (TCCM), Theory of the Normalization Process, Reasoned action theory ,Theory of Stakeholders ,Theory of resource-based perspective ,Institutional theory , transition theory are the other most regularly utilized theories were discovered (1 article).

3.2.2. Context

The context table presents the findings pertaining to the settings (countries) in which consumer behaviour research was done. Table 6 shows the number of research conducted in various nations.

Table 6. Country publication data.

Country	**Articles**	**Percentage**	**Study**
China	10	9.3457944	Ji and Lin [34]; Xing et al. [35]; Wang et al. [36]
Italy	10	9.3457944	Tufford et al. [37]; Massari et al.[38]; Marcon et al. [39]
United kingdom	9	8.411215	Ainsworth et al. [40];Pinkse and Bohnsack[41]; Lucchese-Cheung et al. [42]
Germany	5	4.6728972	Korte et al., [43]; Kunz et al.[44]
Romania	5	4.6728972	Blagu et al. [45], Dima et al.[46]
Denmark	4	3.7383178	Bauer et al. [47]; Aschemann-witzel et al [48]
France	4	3.7383178	Al-ali et al. [49], Hassoun et al. [50]
Greece	4	3.7383178	Tsironi et al. [51], Galanakis et al. [52]
India	4	3.7383178	Ray and Nayak [53]; Bommenahalli Veerabhadrappa et al. [29]

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Table 6 depicts research studies conducted in various nations. China and Italy had the most studies, each with ten, followed by the United Kingdom with nine. With five studies apiece, research investigations from Germany and Romania were also vital.

3.2.3. Characteristics

It summarizes the independent factors - mediating-moderating-dependent factors pertaining to customer behaviour, innovation, and sustainability.

Table 7 provides an overview of the independent variables in terms of consumer behavior were "Consumer Innovations, interactions knowledge sharing, response, perceived effectiveness, social/Hedonist innovativeness, attitude, subjective norms, perceived behavior, green manufacturing practices" were the popular variables. The mediating variables include personal norms, subjective norms attitude, and perceived behavior as most significant with 2 papers followed by consumption attitude and knowledge. Consumer purchase intentions and application of ICT technologies are the moderating variables. And the dependent variables include sustainable product purchase intention, actual adoption and consumption behavior.

Table 7. Variables identified in review.

Type of Variables	Name	Frequency	Study
Independent	Consumer Innovations	1	Li et al. [22]
	Interactions	1	Adnan et al. [25]
	Knowledge sharing	1	Adnan et al.[25]
	Response	1	Adnan et al. [25]
	Perceived effectiveness	1	Chen et al.[28]
	Social/Hedonist innovativeness	1	Li et al. [22]
	Attitude	1	Jain et al. [54]
	Subjective rules	1	Jain et al. [54]
	Perceived behavior	1	Jain et al. [54]
	Green Manufacturing practices	1	Waheed et al. [24]
Mediating	Personal norms	2	Li et al. [22] ; Adnan et al. [25]
	Subjective norms	2	Li et al. [22] ; Adnan et al. [25]
	Attitude	2	Li et al. [22] ; Adnan et al. [25]
	Perceived behavior	2	Li et al. [22] ; Adnan et al. [25]
	Consumption attitude	1	Chen et al.[28]
	Consumer Knowledge and attitude	1	Li et al. [22]
	Behavioral intention	1	Jain et al. [54]
	Green product innovation	1	Waheed et al. [24]
Moderating	Consumer purchase intentions	1	Adnan et al. [25]
	Application of ICT technologies	1	Chen et al.[28]
Dependent	Sustainable product purchase intention	1	Li et al. [22]
	Actual Adoption	1	Adnan et al. [25]
	Consumption behavior	1	Chen et al.[28]
	Organic food adaptation behavior	1	Li et al. [22]
	Purchase behavior	1	Jain et al. [54]
	Ecological conscious consuming behavior	1	Waheed et al. [24]

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3.2.4. Methodology

The analysis scrutinised 107 papers in order to comprehend the methods and approaches utilized to investigate the correlations and the findings are summarized in the table. With six investigations, the evaluation revealed that the qualitative approaches the research field. The most prevalent analytical approach, according to the review (10 publications), was structural equation modelling (SEM).

Table 8. Methodologies identified in review.

Research Approach	Publications	Studies
Qualitative	6	Almansour [55]; Gil Lamata et al. [56]; Tanveer et al. [57]; Ziesemer et al. [58]; Weigert [59] ; Lobato-Calleros et al. [60]
Content analysis	2	Almansour [55]; Ziesemer et al. [58]
Bibliometric Analysis	1	Dima et al [61]
Regression	3	Ziesemer et al. [58]; Souissi et al. [62]; Nethravathi et al. [63]
Structural Equation Modeling	10	Jain et al.[54] ; Moroni et al.[64]; Popa et al. [65]
Factor Analysis	3	Sobhanifard and Apourvari [2] ; Adnan et al. [25]; Lucchese-Cheung et al. [66]
Correlation	2	Biercewicz et al. [67], Bucea-Manea et al [68]
TCCM Approach	1	Veerabhadrappa et al. [29]

1. Future Research agenda: What are the prospective research avenues for exploring digital innovation and sustainability-driven consumer behavior in the future? (RQ3)

A SLR is a methodical and transparent method of identifying, selecting, and evaluating relevant research problem(s). The total impact of a field, a group of academics, or a single work was investigated using bibliometric analysis. Table 1 summarizes the 107 articles that were reviewed, 90 of which were original works and 17 of which were literature reviews. The TCCM framework, which consists of four parts: Theory, Context, Characteristics, and Methods, was chosen as the framework for this review. The spread of innovation and the TPB were the two most often utilized theories to explain consumer behaviour. Theory of transitions, Theory of current sociology, Theory of action, Theory of the Normalization Process Reasoned action theory, stakeholder theory, resource-based perspective theory, institutional theory, and transition theory are all examples of theories. The context table displayed the findings related to the settings (countries) where consumer behaviour research was conducted. The independent elements - mediating-moderating-dependent factors relevant to consumer behaviour, innovation, and sustainability were summarized in the characteristics (Table 7). The evaluation looked at 107 publications to understand the methodologies and tactics used to analyse the relationships, and the results were summarized in the table. Structural equation modelling (SEM) was the analytical technique that was most frequently utilised.

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TCCM framework was defined utilizing thematic analysis to offer future research areas. Bibliographic coupling for thematic analysis is shown in Figure 1 and propositions developed are shown in Figure 3.

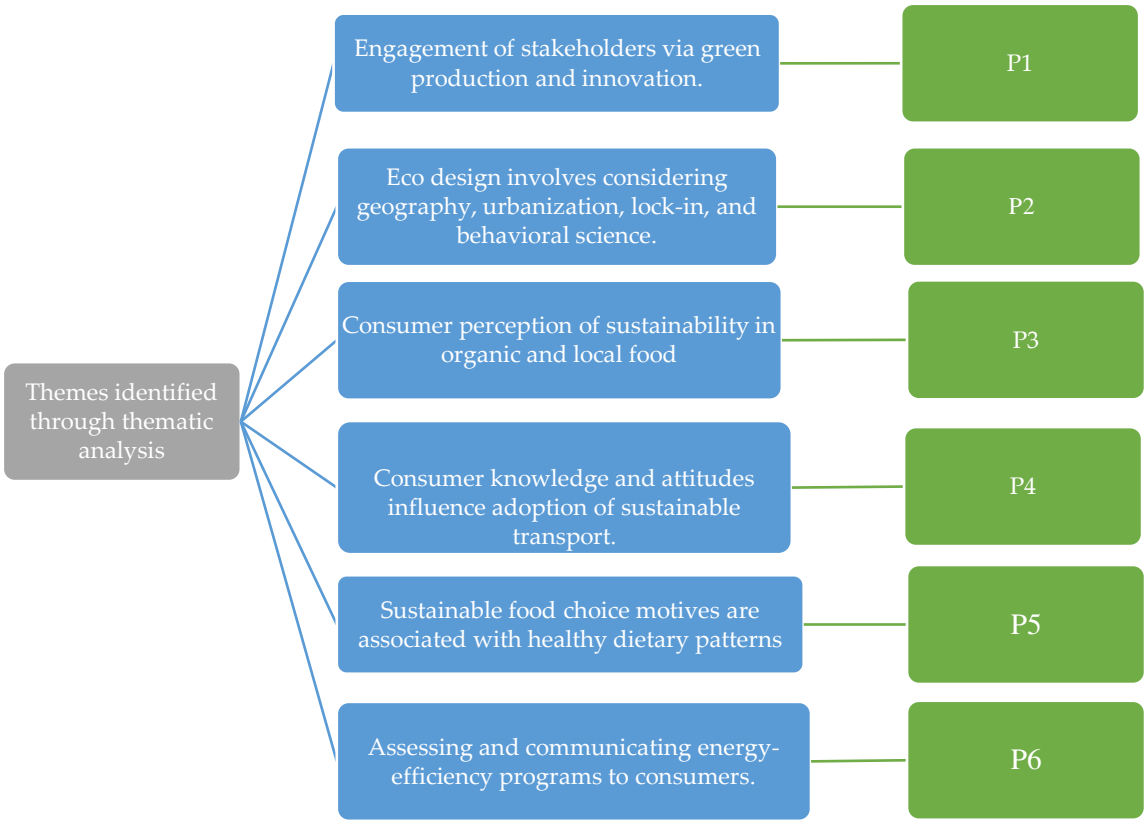

Figure 3. Research Propositions.

4.1. Engagement of stakeholders via green production and digital innovation.

Innovation is critical for long-term development and performance goals. In ecological growth and achievement models, innovation is viewed as an essential component. An absence of sustainability in transport operations necessitates the use of innovative technology, particularly in densely populated cities. However, due to rising production costs, the future of the green vehicle industry remains questionable. It is identified that the success factors of a sustainable business model adopted by an Alternative Food Network (AFN), as well as how it might help to improve sustainable and anti-consumption behaviour. This looks at the impact of sustainable manufacturing practices on environmentally conscious customer behaviour, as well as the role of green product innovation as a mediator. It shows that lean practices that lead to both strategic and process innovation are advantageous for both the manufacturer and the sponsor's sustainability.

Proposition 1 (P1): *Digital Innovation is essential for long-term development and performance goals.*

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4.1.1. Eco design involves considering geography, urbanization, lock-in, and behavioral science.

Past study learned about the potential preconditions for transforming a national innovation system into a quadruple and quintuple helix system for the development of a sustainable forestry-based bio economy. It was motivated by participatory and a trans disciplinary research design, and the results demonstrate that using a quintuple helix in might be a viable path forward towards sustainability. Studies demonstrate that there is no variation between rural and urban locations, as well as disaster-affected and non-disaster-affected areas analyses explains important human behaviour drivers related to use phase modelling and eco design. Insights and approaches might be used to measure consumer behaviour variability, identify behavioral change levers, and potential behavioral changes.

Proposition 2 (P2): *Eco design can be used to transform RIS into sustainable bio economy.*

4.1.2. Consumer perception of sustainability in organic and local food.

Identifying consumer categories with similar characteristics, requirements, and beliefs is critical for establishing successful communication strategies to encourage sustainable food consumption. To encourage sustainable consumption habits, policymakers should evaluate varied levels of sensitivity to sustainability qualities in organic and local food. Previous studies examine empirical consumer studies on waste-to-value in food and drink over the last ten years, indicating that adoption of waste-to-value food items is affected by person, context, and product-related variables. It is investigated that the circular aspects of customers' attitudes towards food purchase, discovering that college-educated young people are the target demographic for circular innovation [69].

Finding the correct marketing tools to integrate these into more environmentally friendly circular systems is critical.

Proposition 3 (P3): *Consumer perception of sustainability attributes in organic and local food, up cycled by-product use, and organic food purchasing behavior.*

4.1.3. Digital knowledge among consumers and their attitude influence adoption of sustainable transport.

Previous research investigates attitudes towards electric vehicle adoption by combining three variables of attitude with the idea of planned behaviour. It implies that ecological relevance and personal desire are major variables in choosing ATT for EV adoption. This develops a model to investigate how a consumer's perceived efficacy influences their purchase of environmentally friendly items. It also offers managerial implications and suggestions for eco-friendly product usage and demonstrates that social innovativeness influences organic food adoption behaviour across all direct and indirect channels, whereas hedonist innovativeness influences organic food adoption behaviour only via the mediation of consumer knowledge.

Proposition 4 (P4): *Consumer knowledge and attitudes influence the adoption of EVs, eco-friendly products, and ICT innovation among consumers.*

4.1.4. Sustainable food choice motives are associated with healthy dietary patterns.

Individuals, particularly women, who are more concerned with food sustainability factors such as ethics, the environment, and local production, seem to eat better. More research is needed to understand how long-term nutritional quality may be influenced by environmental issues. Earlier study looked at the motivations for food choices related with distinct organic and conventional dietary patterns. Green organic food eaters got the greatest mean score for the 'health' component, whereas unhealthy conventional food eaters had the highest mean score for the 'price' dimension. These findings offer fresh insights into the food-choice motivations of a wide range of consumers. Society is becoming increasingly concerned about the use of sustainable animal products, but there

is rising demand to expand meat production. This problem might be solved with the aid of technology.

Proposition 5 (P5): *Food choice motives and sustainability are linked to healthy dietary patterns.*

4.1.5. Assessing and communicating energy-efficiency programs to consumers.

Studies examine a domestic energy-efficiency programme for new energy-efficient appliances and related energy usage in a sustainable supply chain. This maximizes corporate profitability while also determining the optimal energy policy and supply-chain structure for effective domestic energy consumption control. The Shades of Green (SoG) instrument is intended to assist and support customers in their decision-making by giving simple yet comprehensive information on a product's environmental and social sustainability impacts. It also makes it easier for businesses to arrange their sustainability communication such that it is more actionable. The carbon footprint of beverage goods was calculated, and customer attitudes regarding carbon labelling were examined.

Proposition 6 (P6): *Assessing residential energy-efficiency program, communicating sustainability information to consumers.*

5. Implications

This research has examined the literature, assessed publishing trends, and found certain highly referenced works. It presented a comprehensive conceptual framework in the area of consumer, innovation and sustainability. Companies are innovating and providing environmentally friendly alternatives as a result of consumer knowledge of and demand for sustainable products. Sustainability-conscious buyers could look for goods with eco-labels, recyclable packaging, or energy-saving features. This demand motivates companies to spend money on sustainable innovation, which leads to modifications in product development, manufacturing procedures, and supply chain management techniques. By presenting consumers with fresh ideas that meet unmet requirements or boost value, innovation can influence how they behave. For instance, the popularity of electric vehicles responds to consumer demand for more environmentally friendly transportation options [55].

Also, solar panels are becoming more affordable and appealing to consumers. Our comprehensive SLR of the included papers includes the identification and analysis of all significant articles published on the Consumer innovation and sustainability issue. The study conclusions have several significant academic ramifications, which we present and lay a strong foundation for upcoming consumer behaviour research. This review incorporates characteristics often researched in the consumer behavior literature into a conceptual framework to expand the body of knowledge. However, there hasn't been much discussion of how consumer innovation and sustainability research relate to consumer behavior. As a result, the investigation of the link between consumer behavioural traits and innovation and sustainability should be seen as a beginning point. Future research should focus on the innovation and sustainability driven consumer behavior.

Second, we observed that consumer innovation and adopting sustainability into consumer behaviour can create hurdles at several phases of the buying process particularly the technological characteristics (product design) that are critical in determining whether consumer behaviour is accepted or rejected. To describe the complicated decision-making behaviour of consumers, the available publications, however, lack a cogent theoretical foundation and instead use homogeneous and out-of-date theoretical applications. Despite the Diffusion of innovation and TPB model frequent use in earlier studies, but still a long way from having a solid theoretical foundation. Therefore, we recommend that researchers adopt a wider relational view, notably using Affordance theory which could act as the theoretical foundation for further empirical studies.

Lastly, the current study has identified several themes for the future research and shows that Innovation is necessary to bring sustainable outcomes and driving consumer behavior. The first step in this study was a thorough evaluation and synthesis of the literature on consumer innovation and

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sustainability, followed by a discussion of publishing trends and the identification of specific works that had received a lot of citations. We discovered that among these, this study offers comprehensive consideration of elements including eco-design, environmental factors etc. green production, urbanisation, energy efficiency etc. This review incorporates characteristics often researched in the consumer behavior into a conceptual framework to expand the body of knowledge.

Digital innovation allows companies to offer personalized experiences and customizable products to consumers. This trend aligns with sustainability by reducing waste and overproduction. Consumers can choose products that meet their specific needs, minimizing the chances of unused or discarded items. This customization option promotes sustainable consumption patterns. Consumers can now access information on a product's durability, recyclability, and potential for repair. This information empowers consumers to make choices that align with sustainable practices, such as opting for products with longer lifespans or recyclable materials.

The companies can identify end-user wants and behaviour and take into consideration during eco design. It is possible to take into account the preferences, routines, and comfort levels of residents by including them in the design process. This strategy fosters long-term behaviour change, fosters the adoption of sustainable practises, and boosts user happiness and sustainability initiatives and therefore demand businesses to adopt sustainable practises, exhibit corporate social responsibility, and divulge open information about their operations and products. Companies that fall short of these standards run the risk of losing market share and consumer confidence. Cross-socio cultural and substrate culture research is critical for obtaining generalized findings, and researchers should conduct more advanced qualitative and mixed research, and create new analytic methodologies.

The companies may feedback by conducting surveys or interviews with participants to analyse their level of satisfaction with the program's implementation, the success of the sustainable products and any challenges they encountered. The suggested framework is designed to increase efficiency and ensure long-term sustainability; based on the TCCM Framework. Although research has concentrated on the relationship between consumer behaviour and innovation, further research in other national settings is required.

6. Conclusions and Limitations

The article examined a decade of research on consumer behavior and sustainability via innovation to better understand how the field has grown over time. This study sought to evaluate the available literature in order to better understand consumer behavior in through consumer innovation and sustainability. It also attempts to assess the theories and elements influencing consumer behavior before presenting a research agenda for the future. As a result, a SLR was undertaken utilizing the TCCM framework, which offered an integrated indication of previous efforts and their conclusions, followed by a thematic analysis to suggest future study themes. The work adds to the body of knowledge by describing the common and particular elements that impact consumer behaviour, innovation, and sustainability. This work also makes a contribution by outlining new research issues. Future scholars might concentrate on empirical research by taking into account recognized gaps in theory, settings, characteristics, and methods.

Despite its contributions and insights, the review is constrained in various ways. First, our review was restricted to scientific literature gathered from the Scopus database. Future research is intended to supplement other databases as cross-checking procedures, supporting reported in this analysis. Second, despite the fact that the research methodologies utilized in this study selected 107 publications as a good representation, despite the fact that the goal is to ensure that the findings meet high academic standards, we were aware that this might exclude fascinating papers. The review also excluded book chapters, conference papers, and editorial remarks in favor of research published in peer-reviewed English-language journals. As a result, future study should expand the categorization framework by delving into larger themes in order to reveal finer-grained insights.

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