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Purchasing Vegetables in the Digital Era: A Systematic Literature Review on Online Buying Behavior in E-Commerce

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Abstract. This study aims to examine and analyze consumer behavior in purchasing vegetables online through E-Commerce in Indonesia. This can contribute to the creation of online food product marketing in Indonesia. A systematic literature review (SLR) was conducted based on studies of purchasing vegetables online through E-Commerce. The data collection method used the Population, Intervention, Comparison, and Outcome (PICO) framework. The selected articles were relevant to the research objectives (with keywords "Vegetable Purchase" and "Vegetable E-Commerce"). The selection process results showed that out of 171 articles, they met the specified criteria. Consequently, 40 articles were chosen based on the research statement for further review. Findings indicate that various factors, including technology adoption, trust, and social factors, influence consumer behavior in online vegetable purchases in Indonesia. By understanding and meeting consumer needs and expectations and leveraging digital technology, a satisfying shopping experience can be created, thus encouraging repeat purchases.
Keywords: consumer behavior; online purchase; vegetables; e-commerce

INTRODUCTION

The application of digital technology in everyday life is no longer limited to aspects of communication and interaction but has also penetrated the realm of business transactions and shopping. People increasingly use internet technology to do shopping activities, including daily vegetable needs (Kamrath et al., 2018). Thus, a new concept emerges in purchasing where consumers can spend their valuable time on other activities and do not have to go to the market or store because groceries can be delivered to their homes (Trisna et al., 2021; Wibowo et al., 2023). This phenomenon redefines how we shop and makes E-commerce the main platform for buying and selling transactions (B. Li et al., 2020). In relation to this, consumer behavior in this digital era has shifted. More and more consumers are choosing to transact through E-commerce platforms.

According to data reported by the Indonesian Internet Service Providers Association (APJII), in 2023, there were 215,626,156 people out of a total population of 275,773,901 internet users in Indonesia (APJII, 2023). So online shopping has become a trend in this digital era and has received much attention from researchers (Wahyuni Trisna & Fardani Zulkifli, 2021). Online shopping offers many advantages, such as convenience, wider offers, and time savings (Guo et al., 2020). These advantages also apply to shopping for vegetables and other fresh food products. Online vegetable shopping services like Sayurbox allow consumers to easily buy fresh vegetables from home (Dewanthi, 2023). Consumers only need to access the website or application, then choose the desired product to be delivered to their homes at a predetermined time. All of these processes can be done without having to leave the house.

One of the main advantages of online vegetable shopping is convenience. Online shopping allows consumers to shop anytime and anywhere (Dhaoui et al., 2020). Consumers can spend their time on something other than going to the market or store. In addition, online shopping also offers a broader choice. Consumers can easily compare the prices and quality of products

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from various sellers (Rahmalia et al., 2022). In addition, online vegetable shopping can reduce the risk of exposure to disease transmission, such as during the COVID-19 pandemic (Zaman et al., 2022). Consumers can buy their products without interacting directly with others, which may help reduce the spread of the pandemic. However, online shopping also has some disadvantages. One of the main disadvantages of online shopping is the need for more social interaction (Alridhani & Persada, 2020). Conventional shopping allows consumers to interact with sellers and other buyers (Kahfi et al., 2021). In addition, in vegetable shopping, consumers cannot physically check the quality of the vegetables. Although many e-commerce guarantee the quality of their products, there is still a possibility that consumers receive products that are not fresh or not as expected. Online purchasing behavior is also greatly influenced by trust and risk perception. Risk perception is also a main factor influencing online shopping behavior. Consumers who feel online shopping is risky (for example, the risk of fraud, the risk of goods not being appropriate, or privacy risk) tend to be reluctant to shop online. These factors must be considered by e-commerce to build trust and reduce customer risk perception.

Based on previous research, there are similarities as follows. The first study focuses on consumer behavior regarding vegetable purchases and how technology and social media influence their decisions (Selvia & Deliana, 2022). Also, this research emphasizes e-commerce platforms and their role in the purchasing process. The second study is similar to existing research on online purchasing behavior on e-commerce platforms (Huitink et al., 2020). However, this research, focuses more on vegetable purchases. It is also the same in that they both try to understand how online shopping works and how consumer behavior changes in vegetable purchases. While in the third study, it has similarities related to purchasing behavior in the context of vegetables. This research explains how certain factors can influence this behavior. However, the third study emphasizes health messages and social norms, while this research focuses more on online vegetable purchases on e-commerce (Collins et al., 2019).

However, there are differences with previous research, namely, the marketing in this research focuses on purchasing vegetables online through e-commerce platforms. In contrast, the first research focuses on marketing on social media and how it affects purchasing decisions. Thus, the research orientation of this research is broader and covers all aspects of online vegetable purchases, not just Instagram. The difference between this study and the second research is that this research is a literature review focusing on online purchasing behavior on e-commerce platforms. On the other hand, the second research is an empirical study that tests the effect of specific strategies in supporting vegetable purchases in supermarkets. Then, the third research because research focuses on e-commerce platforms and online vegetable purchases, not vegetable purchases in the student canteen environment. In addition, this research is a literature review of previous research on this topic, not empirical research examining the effect of health messages and social norms on vegetable purchases.

Therefore, this research aims to review and analyze consumer behavior in online vegetable purchases through E-Commerce in Indonesia. So this research contributes to a deep understanding of consumer behavior in online vegetable purchases, which still needs to be better understood in previous literature. The findings from this research can be a reference for E-Commerce owners to design more effective and efficient marketing strategies by considering the factors influencing consumer purchasing decisions. In addition, this research also provides insights for other researchers to develop future research related to consumer behavior in online shopping, especially for fresh food products like vegetables. Finally, this

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research also has the potential to contribute to the creation of online food product marketing in Indonesia.

METHODS

This research aims to examine and analyze consumer behavior in purchasing vegetables online via E-Commerce in Indonesia. Thus, the scope of this research primarily focuses on the online purchasing behavior of Indonesian consumers specifically related to vegetables. The preparation of a systematic literature review is based on the Systematic Literature Review (SLR) from studies related to online vegetable purchases through E-Commerce. The data collection method uses the Population, Intervention, Comparison, and Outcome (PICO) framework (Simangunsong, 2022). Publish or Perish version 8 is used to collect journals from Google Scholar and Scopus.

Use of the PICO method Analysis of articles is determined by making research questions; the research questions are obtained through the PICO framework. What must be considered is Population (P) is the determination of research problems and mapping subjects to be studied. Then the research question is developed through a focus on the object under study (Intervention (I)), then making a comparison (comparison (C)) and producing exposure results that can be studied (outcome (O)).

Table 1. Elimination of articles via PICO

PICO	Inclusion	Exclusion
Population	Consumers who buy vegetables online	Consumers who buy vegetables in physical stores or traditional markets.
Intervention	Purchase vegetables online on e-commerce platforms.	Vegetable purchasing behavior through conventional methods
Comparison	Buying Vegetables in the Digital Age	
Outcome	Results of buying behavior through e-commerce that can be implemented in Indonesia	Purchase behavior that cannot be implemented in Indonesia

Here are the research questions and the process of data collection and quality assessment for this study:

Research Questions:

a. What factors influence consumers' online purchasing behavior? (Q1)
b. What are the relevant theories or concepts related to vegetable purchasing using E-Commerce? (Q2)
c. How is the development of vegetable E-Commerce? (Q3)
d. What is the analysis of customer satisfaction in vegetable purchasing through E-Commerce? (Q4)

Data Collection

Based on this research, a wide variety of articles are available. Therefore, the researcher limits the articles included based on the following methodological criteria: (1) 50% of the articles used must be based on field research, (2) At least 50% of the articles used must be included, (3) Only articles referring to references updated from 2019 to 2023 are included, (4) The selected articles must be relevant to the purpose of the study (with keywords "Vegetable Purchasing," "Vegetable E-Commerce"), (5) Research results applicable to Indonesia will be included.

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Data Evaluation

In this stage, the data will be evaluated based on the developed questions and then given scores according to these questions, such as:

a. Was the article published within the time range of 2019-2023? (Q1)
b. Does the article mention "vegetable purchasing," or "Vegetable E-Commerce"? (Q2)
c. Does the article describe the purpose of online vegetable purchasing? (Q3)
d. Does the article discuss the factors influencing consumers' online purchasing behavior? (Q4)
e. Does the article refer to relevant theories or concepts related to vegetable purchasing using E-Commerce? (Q5)
f. Does the article explain the development of vegetable E-Commerce? (Q6)
g. Does the article include an analysis of customer satisfaction in vegetable purchasing through E-Commerce? (Q7)
h. Does the article offer recommendations or solutions to improve vegetable sales on E-Commerce platforms? (Q8)

Then, scores will be assigned based on the following: Yes: The journal paper is aligned with the research questions. No: The journal paper is not aligned with the research questions.

Documentation: In this stage, the research will be documented according to the standard format used for Systematic Literature Reviews (SLRs).

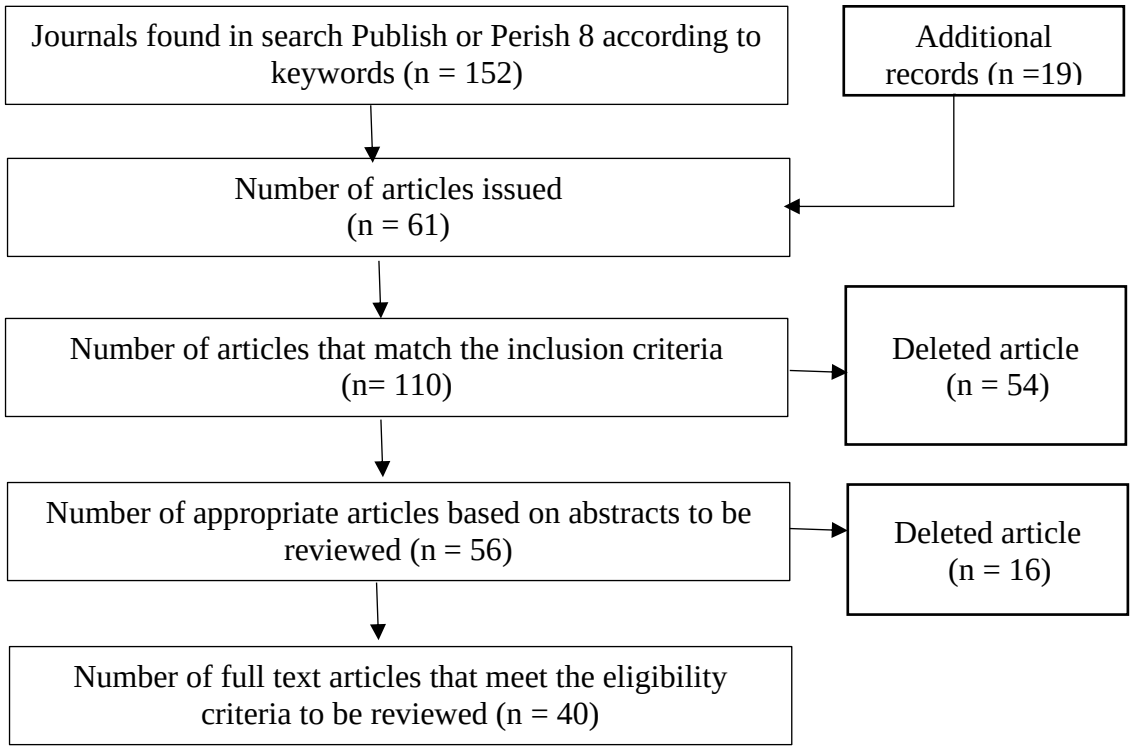

Figure 1. The results of the research stages in the form of PRISMA

RESULTS AND DISCUSSION

The results of the search and data collection yielded 40 journals that were relevant to the reviewed topic. After the search and data collection, the researcher successfully identified several journals aligned with the topic under review.

The results of the selection process based on inclusion and exclusion criteria, as well as quality assessment, showed that 171 articles met the specified criteria. In comparison, 131

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articles were eliminated for failing to meet the inclusion criteria. Additionally, there were excluded scientific papers such as theses and dissertations and articles that fell outside the specified time range of 2019-2023. Consequently, 40 articles were chosen based on the research statement for further review. The stages of the SLR (Systematic Literature Review) process, utilizing PRISMA as a guide, are depicted as follows:

From the results of the figures, the analysis relates to a systematic literature review consisting of 40 journals that have gone through the process of inclusion selection and quality assessment based on the formulated questions. Purchasing vegetables in the digital era has undergone a significant transformation with the emergence of e-commerce. Consumer behavior in buying vegetables has shifted from traditional purchases in physical markets to online purchases. This literature review focuses on online buying behavior in Indonesia.

Table 2. Hasil penelitian yang dapat diimplementasikan dalam Perilaku Pembelian Online di E-Commerce

No	Author/ Year	Title	Source	Method	Databases	Research Focus
1.	Akarsu, T. N. (2023).	Digital transformation towards a sustainable circular economy: Can it be the way forward?	Journal	Qualitative	Journal of Information Technology Teaching Cases	Oddbox Development of Vegetable E-Commerce
2.	Ali, M., Ullah, S., Ahmad, M. S., Cheok, M. Y., & Alenezi, H. (2023)	Assessing the impact of green consumption behavior and green purchase intention among millennials toward sustainable environment.	Journal	Quantitative	Environmental Science and Pollution Research	Vegetable Purchases in the Digital Era Related to Online Purchasing Behavior on E-commerce
3.	Asti, W. P., Handayani, P. W., & Azzahro, F. (2021)	Influence of Trust, Perceived Value, and Attitude on Customers' Repurchase Intention for E-Grocery	Journal	Quantitative	Taylor and Francis: Journal of Food Products Marketing	Sayurbox Development of Vegetable E-Commerce
4.	Boca, G. D. (2021).	Factors influencing consumer behavior in sustainable fruit and vegetable consumption in maramures county, Romania.	Journal	Quantitative	MDPI: Sustainability	Vegetable Purchases in the Digital Era Related to Online Purchasing Behavior on E-commerce
5.	Castagna, A. C., Pinto, D. C., Mattila,	Beauty-is-good, ugly-is-risky: Food aesthetics bias and construal level.	Journal	Quantitative	Elsevier: Journal of Business Research	Imperfect Foods

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	A., & de Barcellos, M. D. (2021).					Development of Vegetable E-Commerce
6.	Chen, S. S., Choubey, B., & Singh, V. (2021)	A neural network based price sensitive recommender model to predict customer choices based on price effect	Journal	Quantitative	Elsevier: Journal of Retailing and Consumer Services	Development of Vegetable E-Commerce
7.	Dewanthi, D. S. (2023).	Consumer Behaviour Towards Grocery Online Shopping During Pandemic: Case Study in Sayurbox.	Journal	Quantitative	Business Economic, Communication , and Social Sciences Journal (BECOSS)	Development of Vegetable E-Commerce
8.	Flores, P. J., & Jansson, J. (2022).	SPICe—Determinants of consumer green innovation adoption across domains: A systematic review of marketing journals and suggestions for a research agenda.	Journal	Systematic Review	Wiley: International Journal of Consumer Studies	Faktor sosial juga mempengaruhi perilaku pembelian online Factors Influencing Consumer Online Purchasing Behavior Consumer
9.	Gede Endra Bratha, W., Tussoleha Rony, Z., & Winarso, W. (2022).	Potential of E-Commerce as a Method of Agricultural Business Marketing on MSME Scale.	Journal	Literature Review	Dinasti International Journal of Economics, Finance & Accounting	Sayurbox Development of Vegetable E-Commerce
10.	Gonera, A., Svanes, E., Bugge, A. B., Hatlebakk, M. M., Prexl, K. M., & Ueland, Ø. (2021)	Moving consumers along the innovation adoption curve: A new approach to accelerate the shift toward a more sustainable diet.	Journal	Quantitative	MDPI: Sustainability (Switzerland)	innovation adoption Theories or Concepts Relevant to Buying Vegetables Using E-Commerce
11.	Gruntkowski, L. M., & Martinez,	Online Grocery Shopping in Germany:	Journal	Quantitative	MDPI: Journal of Theoretical and Applied	Perceived ease of use refers

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	L. F. (2022).	Assessing the Impact of COVID-19.			Electronic Commerce Research	Factors Influencing Consumer Online Purchasing Behavior Consumer
12.	Herath. (2019).	Consumer Behavior and Attitudes in Purchasing Vegetables.	Journal	Quantitative	Agricultural Research & Technology: Open Access Journal	Development of Vegetable E-Commerce
13.	Hezarkhani, B., Demirel, G., Bouchery, Y., & Dora, M. (2023).	Can "ugly veg" supply chains reduce food loss?	Journal	Quantitative	Elsevier: European Journal of Operational Research	Development of Vegetable E-Commerce
14.	Hong, W., Zheng, C., Wu, L., & Pu, X. (2019)	Analyzing the relationship between consumer satisfaction and fresh e-commerce logistics service using text mining techniques.	Journal	Quantitative	MDPI: Sustainability	Customer Satisfaction Factors Influencing Consumer Online Purchasing Behavior Consumer
15.	Jaipong, P., Sriboonruang, P., Siripipattanakul, S., Sitthipon, T., Kaewpuang, P., & Auttawechasakoon, P. (2022).	A review of intentions to use artificial intelligence in Big Data Analytics for Thailand agriculture.	Journal	Qualitative	Review of Advanced Multidisciplinary Science, Engineering & Innovation (Ramsey)	Technology adoption Factors Influencing Consumer Online Purchasing Behavior Consumer
16.	Jiao, J. (2020).	Analysis of the Current Situation and Development Trend of Mainstream Social E-Commerce in China	Journal	Literature review	Atlantis Press: Advances in Economics, Business and Management Research	Alibaba and JD.com Development of Vegetable E-Commerce

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17.	Kiruthika, U., Raja, S. K. S., Balaji, V., & Raman, C. J. (2020)	E-Agriculture for Direct Marketing of Food Crops Using Chatbots.	Proceeding	Quantitative	ICPECTS 2020 - IEEE 2nd International Conference on Power, Energy, Control and Transmission Systems, Proceedings	Vegetable Purchases in the Digital Era Related to Online Purchasing Behavior on E-commerce
18.	Kokkoris, M. D., & Stavrova, O. (2021).	Meaning of food and consumer eating behaviors.	Journal	Quantitative	Elsevier: Food Quality and Preference	Customer Satisfaction in Vegetable Purchases on E-Commerce
19.	Lee, C. L., Strong, R., & Dooley, K. E. (2021).	Analyzing precision agriculture adoption across the globe: A systematic review of scholarship from 1999–2020.	Journal	systematic review	MDPI: Sustainability	innovation adoption Theories or Concepts Relevant to Buying Vegetables Using E-Commerce
20.	Liu, L., & Peng, Q. (2022)	Evolutionary Game Analysis of Enterprise Green Innovation and Green Financing in Platform Supply Chain	Journal	Quantitative	MDPI: Sustainability	Alibaba and JD.com Development of Vegetable E-Commerce
21.	Liu, M., Jia, W., Yan, W., & He, J. (2023).	Factors influencing consumers' repurchase behavior on fresh food e-commerce platforms: An empirical study.	Journal	Qualitative	Elsevier: Food Control	Consumer trust Factors Influencing Consumer Online Purchasing Behavior Consumer
22.	Maulana, S., Najib, M., & Sarma, M. (2021).	Analysis of the Effect of Marketing Mix on Consumer Trust and Satisfaction on Online Purchasing of Organic Food During the Outbreak of the Covid-19.	Journal	Quantitative	Jurnal Aplikasi Manajemen	Consumer trust Factors Influencing Consumer Online Purchasing Behavior Consumer

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23.	Mookerjee, S., Cornil, Y., & Hoegg, J. A. (2021).	From Waste to Taste: How "Ugly" Labels Can Increase Purchase of Unattractive Produce.	Journal	Quantitative	SAGE: Journal of Marketing	Farmbox Development of Vegetable E-Commerce
24.	Naruethara dhol, P., Wongsaich .. (2023).	Consumer Intention to Utilize an E-Commerce Platform for Imperfect Vegetables Based on Health-Consciousness.	Journal	Quantitative	MDPI: Foods	Imperfect Foods Development of Vegetable E-Commerce
25.	Nsele, M. K., Fyama, J. N. M., Maréchal, K., & Dogot, T. (2022).	Factors Influencing the Sustained Adoption of Innovative Techniques by Urban Farmers in Lubumbashi, Democratic Republic of Congo.	Journal	Quantitative	MDPI: Agriculture	Adoption theory Theories or Concepts Relevant to Buying Vegetables Using E-Commerce
26.	Pietrangeli, R., Herzberg, R., Cicatiello, C., & Schneider, F. (2023).	Quality Standards and Contractual Terms Affecting Food Losses: The Perspective of Producer Organisations in Germany and Italy.	Journal	Quantitative	MDPI: Foods	Oddbox Development of Vegetable E-Commerce
27.	Rahmaning tyas, A., Mawardi, N. K., & Sudrajat, I. S. (2022).	Technology Acceptance Model (TAM) as Factors of Online Vegetable Purchasing Decision.	Journal	Quantitative	Agribusiness Journal	Technology adoption Factors Influencing Consumer Online Purchasing Behavior Consumer
28.	Reardon, T., Belton, B., Liverpool-Tasie, L. S. O., Lu, L., Nuthalapati , C. S. R., Tasie, O.,	E-commerce's fast-tracking diffusion and adaptation in developing countries	Journal	Literature Review	Wiley: Applied Economic Perspectives and Policy	Alibaba JD.com Development of Vegetable E-Commerce

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	& Zilberman, D. (2021).					
29.	Richards, T. J., & Rickard, B. (2020).	COVID-19 impact on fruit and vegetable markets.	Journal	Literature Review	Wiley: Canadian Journal of Agricultural Economics	Customer Satisfaction in Vegetable Purchases on E-Commerce
30.	Rogus, S., Guthrie, J. F., Niculescu, M., & Mancino, L. (2020).	Online Grocery Shopping Knowledge, Attitudes, and Behaviors Among SNAP Participants	Journal	Qualitative	Journal of Nutrition Education and Behavior	Buying vegetable Theories or Concepts Relevant to Buying Vegetables Using E-Commerce
31.	Rohe, S., Oltmer, M., Wolter, H., Gmeiner, N., & Tschersich, J. (2022).	Forever niche: Why do organically bred vegetable varieties not diffuse?	Journal	Literature Review	ELSEVIER: Environmental Innovation and Societal Transitions	Customer Satisfaction in Vegetable Purchases on E-Commerce
32.	Ronad, A., & Madgi, M. (2021).	Online Platform for Agricultural Produce Livestock Marketing.	Journal	Quantitative	International Journal on Recent and Innovation Trends in Computing and Communication	Vegetable Purchases in the Digital Era Related to Online Purchasing Behavior on E-commerce
33.	Seopela, L., & Zulu, V. M. (2022)	Consumer perceptions on satisfaction and word of mouth in smallholder horticultural stores in an emerging economy.	Journal	Quantitative	Management Science Letters	Customer Satisfaction in Vegetable Purchases on E-Commerce
34.	Sofi, Y., Susanti, E., Sumantri, A., Budiaman, S. S., & Nuraeni, N. (2023).	Processing Of School Garden Products With Vacuum Frying Technology And Marketing Digitalization In Growing Entrepreneurship And Food Security At The Students Of The Al-Mua ' aawanah	Journal	Literatur review	Abdimas Umtas: Jurnal Pengabdian Kepada Masyarakat LPPM-Universitas Muhammadiyah Tasikmalaya	Shopee, Bukalapak, and Tokopedia. Development of Vegetable E-Commerce

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35.	Stöckli, S., & Dorn, M. (2021).	Awareness, intention, and behavior: Three empirical perspectives on predicting the purchase of abnormally shaped fruits and vegetables. *Resources, Conservation and Recycling*,	Journal	Quantitative	Elsevier: Resources, Conservation and Recycling	Oddbox Development of Vegetable E-Commerce
36.	Truong, V. A., Lang, B., & Conroy, D. M. (2021)	Are trust and consumption values important for buyers of organic food? A comparison of regular buyers, occasional buyers, and non-buyers. *Appetite*,	Journal	Qualitative	Elsevier: Appetite	Consumer trust Factors Influencing Consumer Online Purchasing Behavior Consumer
37.	Wang, Y., & Coe, N. M. (2021).	Platform ecosystems and digital innovation in food retailing: Exploring the rise of Hema in China. *Geoforum*,	Journal	Quantitative	Elsevier: Geoforum	Alibaba, JD.com Development of Vegetable E-Commerce
38.	Warganegara, D. L., & Hendijani, R. B. (2022).	Factors That Drive Actual Purchasing of Groceries through E-Commerce Platforms during COVID-19 in Indonesia.	Journal	Quantitative	MDPI: Sustainability	Technology adoption Factors Influencing Consumer Online Purchasing Behavior Consumer
39.	Zhao, K., Shi, H., Zhang, Y. Y., & Sheng, J. (2021)	Fresh Produce E-Commerce and Online Shoppers' Purchase Intention	Journal	Quantitative	Taylor & Francis: Chinese Economy	Alibaba JD Development of Vegetable E-Commerce
40.	Li, L., Paudel, K. P., & Guo, J. (2021)	Understanding Chinese farmers' participation behavior regarding vegetable traceability systems	Journal	Quantitative	Elsevier: Food Control	Technology adoption Factors Influencing Consumer Online Purchasing Behavior Consumer

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Theories or Concepts Relevant to Buying Vegetables Using E-Commerce

The innovation adoption theory is the most relevant theory in this context (Nsele et al., 2022). This theory explains how individuals accept and adopt innovations, such as e-commerce. According to this theory, innovation adoption is influenced by five factors: relative advantage, compatibility, complexity, trialability, and observability (Gonera et al., 2021; Lee et al., 2021). In online vegetable purchases, the relative advantages may include the convenience of shopping from home, access to various types of vegetables not available in local markets, and the ability to compare prices (Rogus et al., 2020). Compatibility refers to online vegetable purchases aligning with consumers' lifestyles and needs. Complexity refers to the ease or difficulty of the online purchasing process. Trialability and observability refer to consumers' ability to try the service and see the results.

Development of Vegetable E-Commerce

Vegetable e-commerce has grown rapidly in recent years. With an increasing number of consumers switching to online shopping due to its convenience and flexibility, many traditional vegetable sellers have also moved to e-commerce. In addition, many new e-commerce platforms have emerged that specifically target the vegetable market, offering a variety of fresh vegetables directly from farmers to consumers. Examples of rapidly growing vegetable e-commerce can be found in various parts of the world, such as:

a. In the United States, companies like "Farmbox Direct" and "Imperfect Foods" offer fresh vegetable delivery services directly to consumers' doors (Mookerjee et al., 2021). "Farmbox Direct" offers customized organic vegetable boxes. At the same time, "Imperfect Foods" focuses on selling products that may not be visually perfect but are still fresh and edible to reduce food waste (Naruetharadhol et al., 2023).
b. In Europe, "Oddbox" in the UK is another example of an e-commerce platform offering similar services. They collect vegetables and fruits at risk of becoming waste from farmers and suppliers and deliver them directly to consumers' homes in the form of weekly boxes (Pietrangeli et al., 2023; Stöckli & Dorn, 2021).
c. In Asia, especially in China, "Alibaba" and "JD.com" are two major e-commerce platforms that have included fresh vegetables in their product lists. They collaborate with local farmers to ensure that consumers get the freshest products of the best quality (Jiao, 2020; Wang & Coe, 2021; Zhao et al., 2021).
d. In Indonesia, the development of vegetable e-commerce is also quite rapid. "Sayurbox" is an e-commerce platform offering fresh vegetable delivery services (Dewanthi, 2023; Gede Endra Bratha et al., 2022). They collaborate with over 100 local farmers and food producers to deliver fresh products directly to consumers' homes. In addition, major e-commerce platforms like "Tokopedia," "Bukalapak," and "Shopee" have also included fresh vegetables in their product lists, allowing consumers to buy fresh vegetables online and receive direct delivery to their homes (Sofi et al., 2023).

In a global context, the development of vegetable e-commerce has shown significant trends. In the United States, companies like "Farmbox Direct" and "Imperfect Foods" have leveraged digital technology to facilitate the distribution of fresh vegetables directly to consumers. "Farmbox Direct" offers customized organic vegetable boxes based on consumer preferences. At the same time, "Imperfect Foods" focuses on selling products that may not be visually perfect but are still fresh and edible to reduce food waste. This approach reflects innovation in business models and marketing strategies focusing on sustainability and waste reduction (Castagna et al., 2021). In Europe, "Oddbox" in the UK shows a similar business model. They collect

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vegetables and fruits at risk of becoming waste from farmers and suppliers and deliver them directly to consumers' homes in the form of weekly boxes. This reflects a sustainability and waste reduction-oriented approach, aligning with global trends towards a circular economy (Akarsu, 2023; Hezarkhani et al., 2023).

In Asia, especially in China, major e-commerce platforms like "Alibaba" and "JD.com" have included fresh vegetables in their product lists (Reardon et al., 2021). They collaborate with local farmers to ensure that consumers get the freshest products of the best quality (L. Liu & Peng, 2022). This approach reflects vertical integration in the supply chain, where e-commerce platforms work directly with producers to ensure quality and sustainability. Considering the local context and consumer preferences, this business model and marketing strategy can be implemented in Indonesia. For example, the concept of customized organic vegetable boxes from "Farmbox Direct" can be applied by collaborating with local organic farmers. Similarly, the concepts of "Imperfect Foods" and "Oddbox" can be applied with a focus on waste reduction and sustainability promotion.

In Indonesia, the development of vegetable e-commerce is also relatively rapid. "Sayurbox" is an e-commerce platform offering fresh vegetable delivery services (Asti et al., 2021). They collaborate with over 100 local farmers and food producers to deliver fresh products directly to consumers' homes. In addition, major e-commerce platforms like "Tokopedia," "Bukalapak," and "Shopee" have also included fresh vegetables in their product lists, allowing consumers to buy fresh vegetables online and receive direct delivery to their homes. However, there is room for improvement and innovation. For example, e-commerce platforms in Indonesia can expand their collaborations with local farmers and food producers to ensure the quality and sustainability of products. They can also adopt more innovative marketing strategies, such as offering customized products or promoting sustainability, to attract more consumers and differentiate themselves from competitors. In addition, they can leverage digital technology and data to understand consumer needs and preferences and tailor their offerings accordingly (Chen et al., 2021; Herath, 2019). Overall, vegetable e-commerce development shows great growth and innovation potential. By leveraging digital technology, collaborating with local farmers and food producers, and adopting sustainability and waste reduction-oriented marketing strategies, e-commerce platforms can play a crucial role in facilitating the distribution of fresh vegetables and promoting healthy and sustainable vegetable consumption.

Factors Influencing Consumer Online Purchasing Behavior Consumer

Online purchasing behavior is a complex phenomenon influenced by various factors. Several key factors influencing consumer behavior have been identified when buying vegetables online, including technology adoption, trust, and social factors.

a. Technology adoption is a crucial factor in online vegetable purchases. According to the Technology Acceptance Model (TAM), the two main factors influencing technology adoption are perceived usefulness and ease of use (Warganegara & Hendijani, 2022). Perceived usefulness refers to an individual's belief that using a particular system will enhance their job performance. In online vegetable purchases, perceived usefulness can include quality, product availability, and price. Consumers will likely use e-commerce platforms if they feel they provide benefits, such as ease in comparing prices and vegetable quality (Jaipong et al., 2022; L. Li et al., 2021; Rahmaningtyas et al., 2022).
b. Perceived ease of use refers to the degree to which a person believes that using a particular system does not require much effort. In online vegetable purchases, perceived ease of use can include website

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interface design, easy payment processes, and fast and reliable delivery. Consumers will likely use e-commerce platforms if they feel they are easy to use and do not require much effort (Gruntkowski & Martinez, 2022; Warganegara & Hendijani, 2022).

c. Consumer trust in e-commerce platforms also influences purchasing behavior (Truong et al., 2021). The seller's reputation can influence consumer trust, the quality of information the seller provides, and privacy protection (M. Liu et al., 2023). Seller reputation refers to consumer perceptions of the seller's honesty and reliability. Information quality refers to the seller's information's accuracy, completeness, and relevance. Privacy protection refers to the seller's efforts to protect consumer personal information. In online vegetable purchases, consumers will likely buy from sellers with a good reputation and accurate product information (Maulana et al., 2021).
d. Social factors also influence online purchasing behavior. According to the Diffusion of Innovations (DOI) theory, adopting new technology can be influenced by social factors such as social pressure and peer influence (Flores & Jansson, 2022; Rohe et al., 2022). Social pressure refers to the influence others exert in accepting or rejecting innovation. Peer influence is the influence exerted by peers in accepting or rejecting innovation. In the context of online vegetable purchases, consumers may be influenced by recommendations from their friends or family.

Overall, consumer online purchasing behavior is influenced by various factors, including technology adoption, trust, and social aspects. Understanding these factors can help sellers and e-commerce platforms design more effective marketing strategies and increase online vegetable sales.

Customer Satisfaction in Vegetable Purchases on E-Commerce

Customer satisfaction in buying vegetables through e-commerce platforms in Indonesia in this digital era is very important. This customer satisfaction is not only influenced by intrinsic factors of the vegetables themselves, such as quality, freshness, and price, but also by extrinsic factors related to the online shopping experience, such as ease of use of the platform, delivery speed, and customer service (Kokkoris & Stavrova, 2021). Customer satisfaction is the result of a comparison between consumer expectations before making a purchase and the product's actual performance. In online vegetable purchases, consumer expectations can include expectations about vegetable quality (e.g., fresh, pesticide-free vegetables), competitive pricing, and fast and reliable delivery. The actual product performance includes the quality of the vegetables received by consumers, whether the price paid matches the quality of the vegetables, and whether the delivery is done quickly and without damage to the product (Hong et al., 2019; Richards & Rickard, 2020).

Consumers will be satisfied if the product performance exceeds consumer expectations. Conversely, if the product performance meets expectations, consumers will be satisfied. This customer satisfaction will then influence the consumer's decision to repurchase (customer loyalty) and to recommend the e-commerce platform to others (word-of-mouth) (Seopela & Zulu, 2022). In addition, good customer service plays a crucial role in customer satisfaction. Good customer service, which includes quick responses to customer inquiries or complaints, handling product returns, and problem resolution, can enhance customer satisfaction and build long-term relationships between consumers and the e-commerce platform. In this digital era, e-commerce platforms must continually innovate and improve their services to meet the ever-evolving expectations of consumers. They

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must understand their consumers' needs and preferences and tailor their offerings accordingly. In this way, they can enhance customer satisfaction, ultimately increasing customer loyalty and business success in the long run.

Vegetable Purchases in the Digital Era Related to Online Purchasing Behavior on E-commerce

Vegetable purchases in the digital era have undergone a significant transformation with the emergence of e-commerce. Consumer behavior in buying vegetables has changed from traditional purchases in physical markets to online purchases. This literature review focuses on online purchasing behavior in Indonesia and the factors influencing it, including technology adoption, trust, and social factors. Overall, consumer online purchasing behavior is influenced by various factors, including technology adoption, trust, and social aspects. Understanding these factors can help sellers and e-commerce platforms design more effective marketing strategies and increase online vegetable sales. In online vegetable purchases, product quality refers to the freshness, taste, and appearance of the vegetables. Price refers to the extent to which the product price matches the value consumers receive. Delivery refers to the speed and reliability of product delivery to the consumer's home. Customer service refers to the extent to which the seller can meet the needs and expectations of consumers, including handling complaints and product returns. By understanding and meeting consumer expectations in these areas, sellers and e-commerce platforms can enhance customer satisfaction and encourage repeat purchases.

Recommendations or solutions to increase vegetable sales on e-commerce platforms include improving product quality, offering competitive prices, fast and reliable delivery, and excellent customer service. In addition, sellers and e-commerce platforms can leverage digital technology and data to understand consumer needs and preferences and tailor their offerings accordingly. For example, they can use data analysis to identify purchasing trends and consumer preferences and tailor their product offerings and promotions based on these insights (Ali et al., 2023; Boca, 2021). In addition, they can use digital technology to facilitate interaction and communication with consumers, such as through social media or chatbots, to build relationships and trust with consumers (Kiruthika et al., 2020; Ronad & Madgi, 2021). Overall, vegetable purchases in the digital era offer great opportunities for sellers and e-commerce platforms to reach a broader consumer base and increase sales. Understanding and meeting consumer needs and expectations and leveraging digital technology and data can create a satisfying shopping experience and encourage repeat purchases.

CONCLUSION

Based on the literature review conducted, it can be concluded that various factors, including technology adoption, trust, and social factors, influence consumer behavior in online vegetable purchases in Indonesia. Technology adoption, which includes perceived usefulness and ease of use, is crucial in encouraging consumers to buy vegetables online. Consumer trust in e-commerce platforms also influences purchasing behavior, with seller reputation, information quality, and privacy protection as key factors. Social factors, such as social pressure and peer influence, also influence the adoption of new technologies like e-commerce. In addition, customer satisfaction, influenced by product quality, price, delivery, and customer service, is crucial in encouraging repeat purchases and word-of-mouth promotion.

Although this study has provided valuable insights into consumer behavior in online vegetable purchases in Indonesia, some limitations must be acknowledged. First, this study focuses on the available literature and may only cover some factors

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influencing consumer behavior. Second, this study does not conduct empirical analysis of consumer data, so these findings need to be verified through empirical research in the future. Therefore, it is recommended to conduct empirical research to verify these findings and to identify other factors that may influence consumer behavior in online vegetable purchases. In addition, future research can focus on developing and testing effective marketing strategies to increase vegetable sales on the Sayurbox or Tokopedia e-commerce platforms, which can integrate artificial intelligence technology to provide more targeted product recommendations to consumers based on history, their previous purchases.

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