RESEARCH ARTICLE

The Development Of Components And Indicators For Real Estate Sustainability On Social Media Platforms Using The Rough Set E-Delphi Technique

Worawut Leelanapasak [1], Somchai Lekcharoen [2*]

[1,2] College of Digital Innovation Technology, Rangsit University, Thailand.

ARTICLE INFO	ABSTRACT
	Real estate development directly impacts the economy, society, and environment. Social media is a crucial marketing tool in the digital age and promotes real estate sustainability. This research focuses on developing components and indicators for real estate sustainability on social media platforms using the Rough Set e-Delphi Technique. The findings identified eight components and a total of 53 indicators that are suitable for evaluating and advancing sustainable real estate practices on social media. These components and indicators were found to be suitable and possible. This study provides important insights by proposing new guidelines and concepts for the real estate industry to enhance sustainability through social media platforms. The research outcomes can be applied to strategic digital marketing planning, the design and development of sustainability-oriented real estate projects, and fostering community awareness and engagement to minimize environmental impacts, ultimately contributing to sustainable development in the future.

INTRODUCTION

Real estate development plays a critical role in global economic and urban development (Fei et al., 2021). It presents numerous challenges, including value creation and meeting consumer expectations. In Thailand, the growing demand for residential and commercial spaces has surged rapidly, necessitating a focus on sustainability across environmental, economic, and social dimensions (Mourad et al., 2023: Widjaja & Santoso, 2024). Social media has become a key tool for driving marketing efforts in real estate development by enhancing awareness, shaping brand image, and fostering consumer engagement (Lim & Rasul, 2022). Real estate developers or entrepreneurs must utilize various social media platforms to reach target audiences and effectively maintain continuous positive interactions (Feldkamp, 2021: Khan, 2022). In the digital age, consumers predominantly rely on social media as their primary source for information gathering, comparison, and decision-making regarding real estate purchases (Ijomah et al., 2024: Ionaşcu et al., 2020).

The concept of sustainable real estate development is gaining increasing attention globally. Business profitability must align with social benefits, focusing on energy efficiency, minimizing social impacts, and expanding green spaces to improve quality of life (Constantinou & Katafygiotou, 2024: Low et al.,2020). Real estate development requires diverse approaches and methodologies, ensuring that projects are evaluated across multiple dimensions to avoid negative impacts and preserve future resources (Ionaşcu et al., 2020; Robinson & McIntosh, 2022). This research framework examines the critical components: social media platforms, influencer marketing, content marketing, green marketing, customer perceived value, brand image, customer engagement, and sustainable real

estate outcomes. The researcher will employ qualitative methods to identify and establish indicators for each component.

This study employs the Rough Set e-Delphi Technique (Pankham & Chadcham, 2017), which combines the Rough Set Theory and the Delphi Technique in an electronic format. This approach effectively gathers and systematically analyzes expert opinions, reduces data ambiguity, and identifies critical indicators for evaluating sustainable real estate development outcomes on social media platforms (Rajabi et al., 2022).

LITERATURE REVIEW

Sustainability in Real Estate

Sustainable real estate development principles on social media platforms integrate digital marketing strategies with environmental marketing (Preechasin & Satunuwat, 2022: Risdwiyanto et al., 2023). This paradigm shift focuses on real estate development that incorporates economic, social, and environmental dimensions (Hidayat et al., 2022: Kasemmethakul & Wiroonrath, 2022). Key components include:

Social Media Platforms

Social media platforms are software-structured systems that allow users to create and share content, including text, videos, and images, with followers online. These platforms provide analytic tools to track and evaluate marketing performance. They enable effortless information retrieval, rapid access, enhanced comparison, seamless communication, and timely, relevant information that meets user needs (Sajtos et al., 2023; Widjaja & Santoso, 2024).

Influencer Marketing

Influencer marketing relies on influential and credible individuals on social media platforms. These influencers have large follower bases and can drive engagement. This strategy builds business trust, fosters confidence in products and services, and provides honest, straightforward recommendations tailored to customer lifestyles. It also emphasizes creating credible content and fostering long-term relationships with online users or customers (Abou Ali et al., 2021; Nurhandayani et al., 2019).

Content Marketing

Content marketing is a strategic approach to developing and delivering marketing content on social media platforms. This process involves planning, managing, and disseminating valuable, consistent content to target audiences. The goal is to convey enjoyment, modernity, attractiveness, and creativity and reinforce key messages to social media platform users or customers (Baltes, 2015: Bushara et al., 2023).

Green Marketing

Green marketing integrates environmental sustainability principles into product development, communication, and consumer engagement strategies. It emphasizes promoting an eco-friendly brand image, maintaining a strong reputation for environmental conservation, ensuring transparency, practicing socially desirable behaviors, and prioritizing environmental concerns in operations. This approach addresses pollution and sustainability awareness among social media platform users or customers (Román-Augusto et al., 2022; Wu & Chen, 2014).

Customer perceived value

Customer perceived value refers to the psychological process through which consumers evaluate the worth of a product or service by comparing the benefits received against the resources expended. This involves assessing satisfaction based on perceived quality, adherence to standards, alignment with customer needs, the reliability of provided information, reasonable pricing, value for money, and satisfaction derived from their experiences on social media platforms (Bazrkar et al., 2021; Hien & Nhu, 2022).

Brand image

Brand image is the expression of a set of beliefs, emotions, and evaluations regarding a brand by social media platform users. It reflects perceptions of a positive brand reputation, widespread

recognition, an easily identifiable logo, unique characteristics, modernity, and alignment with the expectations of social media platform users or customers (El-Jalil et al., 2023; Nurhandayani et al., 2019).

Customer engagement

Customer engagement refers to the dynamic interaction process between consumers and brands on social media platforms, encompassing cognitive, emotional, and behavioral participation. It includes responses to marketing activities, such as frequent visits to the platform, following updates, liking relevant content, sharing valuable information, saving preferred content, and providing comments on the social media platforms (Brodie et al., 2011; Matin & Laksamana, 2023: Meiners et al., 2010).

Sustainable real estate outcomes

Sustainable real estate outcomes involve aims at measuring customer response behavior under Economic, social, and environmental sustainability. These outcomes are evaluated based on consumer experiences that align with received value and expectations and corporate social and environmental responsibility awareness. Indicators include satisfaction with using social media platforms, willingness to recommend to others, participation in activities, trust, perceived value, satisfaction with experiences, professionalism in business ethics, loyalty to eco-friendly brands, and likely avoid using social media platforms that lack social responsibility (Almana & Mirza, 2013: Bowen & Chen, 2001: Musthafa & YC, 2022: Román-Augusto et al., 2022: Schlegelmilch et al., 1996: Sutriani et al., 2024).

Rough Set e-Delphi Technique

The Rough Set e-Delphi Technique is a hybrid methodology combining the Delphi Technique and Rough Set Theory, designed to enhance the accuracy of gathering and analyzing expert opinions through electronic media (Pankham & Chadcham, 2017). This approach mitigates constraints of time and location. The iterative process provides experts with feedback and allows them to refine their opinions until a consensus is reached (Mamaqi et al., 2010; Naisola-Ruiter, 2022).

This technique is grounded in Rough Set Theory, which handles uncertain and ambiguous data, allowing for more precise pattern analysis. Integrating with the Delphi process, which systematically refines expert opinions, enables practical evaluation and synthesis of qualitative data (Nuamthong & Pankham, 2023).

RESEARCH METHODOLOGY

This study employs qualitative research methodology. The Ethics Review Board of Rangsit University in Thailand has reviewed and approved this study, and the COA. No. is RSUERB2024-128. The researcher conducted a comprehensive literature review and synthesized preliminary indicators before selecting the Rough Set e-Delphi Technique for data collection (Mamaqi et al., 2010: Day & Bobeva, 2005: Pankham & Chadcham, 2017). A purposive sampling method was used to select 21 experts with at least five years of knowledge, skills, and experience in the real estate industry. The participants were divided into three groups, each comprising seven experts. The first group consisted of real estate developers involved in projects related to buying, selling, leasing, and investing. The second group included academic experts, such as university professors and independent scholars, with real estate business expertise and proficiency in social media. The third group comprised marketing professionals, investment consultants, and experts in project development related to real estate buying, selling, leasing, and investing.

Research Process Using the Rough Set e-Delphi Technique

The qualitative research process employed the Rough Set e-Delphi Technique, questionnaires distributed via email to 21 experts. The process utilized research instruments to gather data from the experts, leveraging electronic surveys to explore, select, and define the characteristics of factors to be developed into components and indicators. These were derived from a literature review and document analysis. Detailed steps by Pankham and Chadcham (2017), The research methodology consisted of five steps:

Step 1: Definition, Classification, and Attribute definition.

Definition was defined as a_1 (suitability) and a_2 (possibility). A seven-point rating scale was used for classification. The scoring criteria were based on two aspects:

Suitability and Possibility ratings of 5-7 indicated agreement.

Suitability and Possibility ratings of 1-4 indicated non-agreement.

Step 2: Decision Table Construction.

Two key approximations were defined:

Lower Approximation: This refers to the set of indicators or questions that the expert agrees. The formula for the lower approximation is as follows:

Lower Approximation = $\{x \in U: [x]R \subseteq X\}$.

Upper Approximation: This refers to the set of indicators or questions where there is disagreement among experts. The formula for the upper approximation is as follows:

Upper Approximation = $\{x \in U: [x]R \cap X \neq \emptyset\}$.

Step 3: Decision Rules Establishment.

Three decision conditions were defined:

Acceptance (d = 1): Lower approximation case where $a_1 \geq 5$ and $a_2 \geq 5$.

Non-acceptance (d = 0): Upper approximation case where $a_1 \leq 4$ and $a_2 \leq 4$.

Non-acceptance (d = 2): All other cases.

Step 4: Quality of Lower Approximation (QL) Calculation.

The Quality of Lower Approximation (QL) was calculated by dividing the number of experts agreeing with the indicators that met the criteria by the total number of experts who responded to the questionnaire. The formula is expressed as: QL = $\{x \in U: [x]R \subseteq X\}$ / U.

where:

U represents all expert opinions.

X is the set of expert opinions agreeing with the indicators.

[x]R represents the set members agreeing with the indicators.

Step 5: Consensus Measurement Criteria.

The decision criteria were established as follows:

QL < 0.75: No consensus of expert opinions on the indicators.

QL ≥ 0.75: Consensus of expert opinions on the indicators.

Data Collection

The data was collected through an online questionnaire administered to 21 experts over two months, from September to October 2024. After receiving completed responses from all 21 experts, the data was compiled and analyzed for consistency.

Data Analysis

The analysis employed the Rough Set e-Delphi Technique with a decision criterion that required indicators to achieve a Quality of Lower Approximation (QL) ≥ 0.75 to be considered as having reached expert consensus (Nuamthong & Pankham, 2023: Pankham & Chadcham, 2017).

RESULTS

The findings from the analysis using the Rough Set e-Delphi Technique with 21 experts across three groups provided complete responses for the components and indicators. The results confirmed eight components and 53 indicators of real estate sustainability on social media platforms.

Table 1: *Summary: Confirm opinions on components and indicators.*

Indicator No.	Components and indicators for real estate sustainability on social media platforms	Rough set e-Delphi Technique	
		Suitability and Possibility	
		QL	Results
	1) **Social Media Platform**		
1	You think that searching for real estate information on social media platforms is easy.	1.00	Consensus
2	You think that accessing real estate information on social media platforms is efficient.	1.00	Consensus
3	You have a positive experience using social media platforms to research real estate information.	1.00	Consensus
4	Do you think real estate information on social media platforms helps you compare options more effectively.	1.00	Consensus
5	You think that communicating with real estate administrators on social media platforms is convenient.	1.00	Consensus
6	You think real estate information on social media platforms is up to date and meets your needs.	1.00	Consensus
7	You think that real estate platforms are designed in a way that aligns with your usage patterns.	0.95	Consensus
	2) **Influencer Marketing**		
8	You think that real estate influencers on social media platforms are knowledgeable about what they are presenting.	0.76	Consensus
9	You think that real estate influencers on social media platforms are honest in presenting information straightforwardly.	0.86	Consensus
10	You think that real estate influencers on social media platforms can build confidence in products and services.	0.90	Consensus
11	You think that real estate influencers on social media platforms can increase trust in real estate.	1.00	Consensus
12	You think that real estate influencers on social media platforms have a lifestyle that matches yours.	1.00	Consensus
13	You think that real estate influencers on social media platforms make the content they present more credible.	0.76	Consensus
14	You think that real estate influencers on social media platforms can build a long-term relationship with you.	0.86	Consensus
	3) **Content Marketing**		
15	You think that creating real estate content on social media platforms is interesting.	1.00	Consensus
16	You think that creating real estate content on social media platforms is creative.	1.00	Consensus
17	You think that creating real estate content on social media platforms is modern.	1.00	Consensus

18	You think that creating real estate content on social media platforms is attractive.	1.00	Consensus
19	You think that creating real estate content on social media platforms consistently emphasizes important information.	1.00	Consensus
20	You think that creating real estate content on social media platforms is fun.	1.00	Consensus
21	You think that creating real estate content on social media platforms has information that is relevant to you.	1.00	Consensus
	4) **Green Marketing**		
22	You think that real estate on social media platforms offers environmentally friendly materials	0.86	Consensus
23	You think that real estate on social media platforms offers environmental protection.	0.95	Consensus
24	You think that real estate on social media platforms offers social responsibility.	0.95	Consensus
25	You think that real estate on social media platforms offers energy-saving measures.	0.90	Consensus
26	You think that real estate on social media platforms offers pollution-aware business practices.	0.95	Consensus
27	You think that real estate on social media platforms offers business models with a good reputation for environmental conservation.	0.90	Consensus
	5) **Customer Perceived Value**		
28	You think real estate on social media platforms has good quality projects with standards.	1.00	Consensus
29	You think real estate on social media platforms provides valuable and reliable information.	1.00	Consensus
30	You think that real estate on social media platforms provides value for money compared to the price.	0.95	Consensus
31	You think real estate on social media platforms provides details that meet your needs.	1.00	Consensus
32	You think that real estate on social media platforms offers reasonable prices.	1.00	Consensus
33	You think real estate on social media platforms creates a good customer experience.	1.00	Consensus
	6) **Brand Image**		
34	You think that real estate on social media platforms has a good image.	1.00	Consensus
35	You think that real estate on social media platforms has a good reputation.	1.00	Consensus
36	You think real estate on social media platforms helps create a unique identity.	1.00	Consensus
37	You think that real estate on social media platforms has a logo that is easy to remember.	1.00	Consensus
38	You think real estate on social media platforms has content that meets expectations.	0.95	Consensus
39	You think that real estate on social media platforms is modern.	0.90	Consensus
	7) **Customer Engagement**		

40	You often share helpful information about real estate on social media platforms.	0.90	Consensus
41	You often follow news about real estate on social media platforms.	1.00	Consensus
42	You often comment on real estate on social media platforms.	0.95	Consensus
43	You often visit real estate on social media platforms.	1.00	Consensus
44	You often like interesting content about real estate on social media platforms.	0.95	Consensus
45	You often save information you like about real estate on social media platforms.	1.00	Consensus
	8) **Sustainable Real Estate Outcome**		
46	You are satisfied with real estate on social media platforms that promote environmental sustainability.	1.00	Consensus
47	You are confident in real estate on social media platforms that create content that reflects the value of sustainability.	0.90	Consensus
48	You are likely to recommend or recommend real estate on social media platforms that promote quality of life in environmentally friendly projects.	0.95	Consensus
49	You prioritize business ethics of real estate on social media platforms	0.86	Consensus
50	You are satisfied with the experience you received from real estate on social media platforms	0.95	Consensus
51	You are willing to support real estate on social media platforms and brands that focus on environmental conservation.	1.00	Consensus
52	You will likely join social activities organized by real estate on social media platforms emphasizing the benefits of reducing resource use.	0.95	Consensus
53	You will likely avoid using real estate on social media platforms that lack social responsibility.	0.95	Consensus

From Table 1, The Development of Components and Indicators for the Sustainability of Real Estate on Social Media Platforms Using the Rough Set e-Delphi Technique, the study acceptance eight components and 53 indicators, which can be utilized to assess the suitability and possibility of sustainable practices, these findings also provide practical implications for formulating digital marketing strategies and designing real estate projects focusing on sustainability.

DISCUSSION

Using the Rough Set e-Delphi Technique in this study facilitated the simultaneous collection of expert opinions and efficiently analyzed complex and uncertain data. This approach provided systematic insights for improving research planning and management. The confirmed research results, which confirm eight components and 53 indicators, are as follows:

Social media platforms for real estate are an effective channel for accessing and comparing information quickly and conveniently. These platforms simplify communication with service providers, highlighting the importance of digital technology in the current real estate industry. This aligns with Sörensen et al. (2023), who found that the functionality of platforms significantly drives user engagement. Similarly, Widjaja and Santoso (2024) emphasized that adopting modern platforms tailored to customers' needs in the real estate industry positively impacts corporate performance.

Influencer marketing is crucial in building confidence and trustworthiness in the real estate sector. It fosters consumer trust by presenting clear, straightforward information while establishing long-term relationships through engaging content that aligns with followers' lifestyles. This supports the findings of Abou Ali et al. (2021), who highlighted that influencer attributes impact perceived value, attitude formation, and purchasing decisions. Similarly, Kareem and Venugopal (2023) revealed that influencers' attitudes, credibility, and expertise significantly influence purchase decisions. Furthermore, Nurhandayani et al. (2019) emphasized that influencers play a vital role in shaping brand image.

Content Marketing in real estate has evolved to be more creative, modern, and captivating, focusing on delivering meaningful and engaging consumer experiences. Regular reinforcement of key messages and entertaining and compelling formats have become essential strategies to attract attention. This aligns with Sörensen et al. (2023), who found that high-quality content enhances user engagement, and Bushara et al. (2023), who concluded that content fostering positive brand attitudes leads to increased word-of-mouth recommendations.

Green marketing has garnered significant attention in promoting sustainability in the real estate industry. It emphasizes using eco-friendly materials, environmental protection, and corporate social responsibility. Highlighting energy-saving measures and addressing pollution concerns are paramount. Román-Augusto et al. (2022) reported that environmental value contributes to customer satisfaction (Erwin et al., 2021), while Wu and Chen (2014) demonstrated that environmental awareness influences purchasing decisions more than product awareness.

Customer-perceived value emphasizes project quality, standards, and cost-effectiveness. Providing reliable and beneficial information and creating positive experiences are key factors influencing buying, selling, renting, or investing decisions in real estate. Bazrkar et al. (2021) noted that perceived value mediates the relationship between digital marketing strategies and business outcomes. Similarly, Hien and Nhu (2022) found that perceived value mediates purchase decisions.

Brand image is critical for establishing credibility and recognition. Distinctiveness, reputation, and easily recognizable logos are strategic factors in differentiating real estate brands. Nurhandayani et al (2019) indicated that creating a memorable brand image positively influences purchase decisions. This aligns with El-Jalil et al. (2023), who found that brand image positively impacts desired business outcomes.

Customer engagement reflects interest and attachment to real estate brands by sharing information, following, commenting, and maintaining continuous interaction. These are key indicators of marketing communication success. Matin and Laksamana (2023) observed that fostering customer engagement positively impacts desired outcomes in the real estate sector. Erwin et al. (2023) further noted that increased engagement campaigns in small businesses enhance desired outcomes.

Sustainable real estate outcomes focus on customer satisfaction regarding environmental sustainability, ethical business practices, and support for brands committed to environmental conservation and quality of life. Almana and Mirza (2013) found that satisfaction and brand support influence customer decisions (Bowen & Chen, 2001). Román Augusto et al. (2022) highlighted that enhancing life quality and environmental satisfaction boosts sales in eco-friendly businesses. Eyadat et al. (2024) further confirmed that environmentally conscious marketing establishes sustained competitive advantages, promoting effective growth and long-term sustainability (Sutriani, et al., 2024).

CONCLUSION AND RECOMMENDATIONS

The research findings of "The Development of Components and Indicators for Real Estate Sustainability on Social Media Platforms Using the Rough Set e-Delphi Technique" revealed and validated eight components and 53 indicators crucial for real estate sustainability. The real estate on social media will play a pivotal role in connecting developers, investors, and consumers and building transparent, trustworthy, and socially responsible platforms. At the same time, leveraging technology, introducing innovations, and encouraging user participation will propel the industry toward greater sustainability and efficiency.

Future studies should examine these indicators across different markets and regions to establish broader applicability. Additionally, longitudinal studies could provide better insights into the evolving nature of outcome indicators in the sustainable real estate industry.

REFERENCES

Abou Ali, A. A., Ali, A. A., & Mostapha, N. (2021). The role of country of origin, perceived value, trust, and influencer marketing in determining purchase intention in social commerce. BAU Journal-Society, Culture and Human Behavior, 2(2), 10.

Almana, A. M., & Mirza, A. A. (2013). The impact of electronic word of mouth on consumers' purchasing decisions. International Journal of Computer Applications, 82(9), 23-31.

Baltes, L. P. (2015). Content marketing-the fundamental tool of digital marketing. Bulletin of the Transilvania University of Brasov. Series V: Economic Sciences, 8(2). 111 – 118.

Bazrkar, A., Hajimohammadi, M., Aramoon, E., & Aramoon, V. (2021). Effect of the social media marketing strategy on customer participation intention in light of the mediating role of customer perceived value. Market-Tržište, 33(1), 41-58.

Bowen, J. T., & Chen, S. L. (2001). The relationship between customer loyalty and customer satisfaction. International journal of contemporary hospitality management, 13(5), 213-217.

Brodie, R. J., Hollebeek, L. D., Jurić, B., & Ilić, A. (2011). Customer engagement: Conceptual domain, fundamental propositions, and implications for research. Journal of service research, 14(3), 252-271.

Bushara, M. A., Abdou, A. H., Hassan, T. H., Sobaih, A. E. E., Albohnayh, A. S. M., Alshammari, W. G., ...& Elsaied, M. A. (2023). Power of social media marketing: how perceived value mediates the impact on restaurant followers' purchase intention, willingness to pay a premium price, and e-WoM?. Sustainability, 15(6), 5331.

Constantinou, M., & Katafygiotou, M. (2024). The Evolution of Environmental, Social, and Governance Practices Into the Real Estate Sector. In *ESG and Total Quality Management in Human Resources* (pp. 167-200). IGI Global.

Day, J., & Bobeva, M. (2005). A Generic Toolkit for the Successful Management of Delphi Studies. The Electronic Journal of Business Research Methodology, 3(2), 103-116.

El-Jalil, A., Gaber, S., Atito, M., Rady, A., & Fawy, W. M. (2023). The effect of brand image and brand awareness through social media on purchase intention in the Egyptian youth hostels. Minia Journal of Tourism and Hospitality Research MJTHR, 15(1), 53-71.

Erwin, E., Suade, Y. K. M., & Poernomo, W. (2021). Analyzing digital marketing, green marketing, networking and product innovation on sustainability business performance, silk cluster in Polewali-Mandar, west Sulawesi. International Journal of Economics, Business and Accounting Research (IJEBAR), 5(3), 2850-2871.

Eyadat, A. A., Almuhana, M., & Al-Bataineh, T. (2024). The role of green marketing strategies for a competitive edge: A case study about analysis of leading green companies in Jordan. Business Strategy & Development, 7(3), e70000.

Feldkamp, J. (2021). The rise of TikTok: The evolution of a social media platform during COVID-19. Digital responses to Covid-19: Digital innovation, transformation, and entrepreneurship during pandemic outbreaks, 73-85.

Fei, W., Opoku, A., Agyekum, K., Oppon, J. A., Ahmed, V., Chen, C., & Lok, K. L. (2021). The critical role of the construction industry in achieving the sustainable development goals (SDGs): Delivering projects for the common good. Sustainability, 13(16), 9112.

Hidayat, M., Salam, R., Hidayat, Y. S., Sutira, A., & Nugrahanti, T. P. (2022). Sustainable Digital Marketing Strategy in the Perspective of Sustainable Development Goals. Komitmen: Jurnal Ilmiah Manajemen, 3(2), 100-106.

Hien, N. N., & Nhu, T. N. H. (2022). The effect of digital marketing transformation trends on consumers' purchase intention in B2B businesses: The moderating role of brand awareness. Cogent Business & Management, 9(1), 2105285.

Ijomah, T. I., Idemudia, C., Eyo-Udo, N. L., & Anjorin, K. F. (2024). Innovative digital marketing strategies for SMEs: Driving competitive advantage and sustainable growth. International Journal of Management & Entrepreneurship Research, 6(7), 2173-2188.

Ionaşcu, E., Mironiuc, M., Anghel, I., & Huian, M. C. (2020). The involvement of real estate companies in sustainable development—An analysis from the SDGs reporting perspective. Sustainability, 12(3), 798.

Kareem, S. A., & Venugopal, P. (2023). Social media influencers' traits and purchase intention: A moderated mediation effect of attitude towards brand credibility and brand familiarity. FIIB Business Review, 23197145231162257.

Kasemmethakul, T., & Wiroonrath, S. (2022). Digital marketing strategies for real estate business during the pandemic of Covid-19. Journal of Value Chain Management and Business Strategy, 1(1), 51-66.

Lim, W. M., & Rasul, T. (2022). Customer engagement and social media: Revisiting the past to inform the future. Journal of Business Research, 148, 325-342.

Low, S., Ullah, F., Shirowzhan, S., Sepasgozar, S. M., & Lin Lee, C. (2020). Smart digital marketing capabilities for sustainable property development: A case of Malaysia. Sustainability, 12(13), 5402.

Mamaqi, X., Miguel, J., & Olave, P. (2010). The e-Delphi method to test the importance competence and skills: Case of the lifelong learning Spanish trainers. International Journal of Educational and Pedagogical Sciences, 4(6), 1317-1325.

Matin, M., & Laksamana, P. (2023). Analysis of the Influence of Mobile Marketing and Social Media Marketing on Purchase Intention with Customer Engagement as an Intervening Variable in the Property Industry. Journal of Social Research, 2(5), 1765-1773.

Meiners, N. H., Schwarting, U., & Seeberger, B. (2010). The Renaissance of Word-of-Mouth Marketing: A'New'Standard in Twenty-First Century Marketing Management?!. International Journal of Economic Sciences and Applied Research, 3(2), 79.

Mourad, R., Wahid, J. B., Alkubise, O. A. A., & Najar, I. A. (2023). Investigation of the sustainability potentials in the ten house project bangkok-thailand. J. Sustain. Dev. Plan, 18(3), 729-735.

Musthafa, I. Z. F., & YC, Y. (2022). Motivation and factors affecting Indigenous People's willingness to participate in future REDD+ project activities: the case of Tagal Hutan in Sabah, Malaysia. International Forestry Review, 24(3), 411-425.

Naisola-Ruiter, V. (2022). The Delphi technique: a tutorial. Research in Hospitality Management, 12(1), 91-97.

Nuamthong, T., & Pankham, S. (2023). Brand Equity Development of Online Health and Beauty Entrepreneurs Using Rough Set e-Delphi Technique. Kurdish Studies, 11(2), 1632-1645.

Nurhandayani, A., Syarief, R., & Najib, M. (2019). The impact of social media influencer and brand images to purchase intention. Jurnal Aplikasi Manajemen, 17(4), 650-661.

Pankham, S., & Chadcham, S. (2017). Development of an Expert Panel Consensus Measurement Procedure using Rough Set Theory in the e-Delphi Technique. Research Methodology & Cognitive Science, 14(2), 87-101.

Preechasin, T., & Satunuwat, P. (2022). The influence of social media on real estate purchase decisions. Journal of Management Science Review, 24(3), 251-262.

Rajabi, S., El-Sayegh, S. M., & Romdhane, L. (2022). Identification and assessment of sustainability performance indicators for construction projects. Environmental and Sustainability Indicators, 15, 100193. https://doi.org/10.1016/j.indic.2022.100193

Risdwiyanto, A., Sulaeman, M. M., & Rachman, A. (2023). Sustainable Digital Marketing Strategy for Long-Term Growth of MSMEs. Journal of Contemporary Administration and Management (ADMAN), 1(3), 180-186.

Robinson, S., & McIntosh, M. G. (2022). A literature review of environmental, social, and governance (ESG) in commercial real estate. Journal of real estate literature, 30(1-2), 54-67.

Román-Augusto, J. A., Garrido-Lecca-Vera, C., Lodeiros-Zubiria, M. L., & Mauricio-Andia, M. (2022). Green marketing: drivers in the process of buying green products—the role of green satisfaction, green trust, green WOM and green perceived value. Sustainability, 14(17), 10580.

Sajtos, L., Cao, J. T., Zhang, W., Peko, G., & Sundaram, D. (2023). Developing a feature-centric and affordance-based conceptualization of social media interactions. Asia Pacific Journal of Marketing and Logistics, 35(5), 1224-1244.

Schlegelmilch, B. B., Bohlen, G. M., & Diamantopoulos, A. (1996). The link between green purchasing decisions and measures of environmental consciousness. European journal of marketing, 30(5), 35-55.

Sörensen, I., Vogler, D., Fürst, S., & Schäfer, M. S. (2023). Platforms matter: analyzing user engagement with social media content of Swiss higher education institutions. Journal of Marketing for Higher Education, 1-20.

Sutriani, S., Muslim, M., & Ramli, A. H. (2024). The Influence of Experience, Satisfaction And Service Quality on Word of Mouth Intentions And Customer Loyalty. Jurnal Ilmiah Manajemen Kesatuan, 12(4), 1037-1052.

Widjaja, H., & Santoso, H. (2024). Digital Marketing: A Case Study of Social Media Marketing of Indonesia Real Estate Companies. Business Economic, Communication, and Social Sciences Journal (BECOSS), 6(2), 143-157.

Wu, S. I., & Chen, Y. J. (2014). The impact of green marketing and perceived innovation on purchase intention for green products. International Journal of Marketing Studies, 6(5), 81.