

Digital Marketing Implementation in Property Sales: Improving Promotion, Data Management, and Customer Engagement

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Article Info	Abstract
Article History: Received : 27/01/2026 Reviewed : 06/02/2026 Revised : 15/02/2026 Accepted : 31/03/2026 Keywords: Digitalization; Digital Marketing; Information Technology; Property Sales  License: cc-by-sa	The development of digital technology has significantly transformed business sales activities, including in the property sector. However, PT. Dewe Makmur Mapan previously faced several challenges, such as limited digital marketing strategies, unstructured management of prospective customer data, and slow responses to customer inquiries. Therefore, this community service aimed to implement digitalization in the sales process to improve marketing effectiveness and customer service performance. Program applied the Asset Based Community Development (ABCD) method by identifying the company's existing digital assets and optimizing them for marketing and customer interaction. The novelty of this activity lies in integrating digital promotional content, structured customer data management, and direct communication with prospective buyers through social media platforms. activities included conducting organizational reviews, managing social media marketing, creating digital promotional content, compiling prospective customer data, and communicating with consumers through digital platforms. The implementation of digitalization showed positive impacts, such as improved promotional strategies, more organized customer data management, and faster responses to prospective buyers. In addition, digitalization supported better coordination among sales teams in decision-making. This activity also contributes to the achievement of the Sustainable Development Goals (SDGs), particularly SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Innovation, and Infrastructure).

INTRODUCTION

The property industry in Indonesia plays a significant role in national economic growth. According to Badan Pusat Statistik (BPS, 2024), the real estate and construction sectors contribute substantially to Indonesia's Gross Domestic Product (GDP) and generate millions of employment opportunities across various supporting industries, including building materials, financial services, and transportation. Property development in East Java has consistently increased as a result of urbanization, improved infrastructure, and rising housing demand, especially in quickly developing regions like Sidoarjo, Gresik, and Pasuruan. However, real estate firms must implement more flexible and technologically advanced business strategies in the face of fierce market rivalry and changing consumer behavior in the post-pandemic era (Sholikah, 2025).

A significant movement toward digital information outlets is evident in recent consumer patterns. Before making a purchase, over 70% of potential buyers look for home information online, according to a number of industry statistics (Wang & Wei, 2022). This change demonstrates the increasing significance of virtual tours, online real estate listings, digital marketing, and real-time client communication. Due to their limited reach, increased operating expenses, and limited connection with potential customers, traditional marketing mediums like brochures, banners, and printed advertisements are becoming less and less successful (Model et al., 2023). The sales process, which was formerly carried out manually and traditionally, is now moving toward digital technology in reaction to these developments. Businesses can increase

productivity, access a wider audience, and respond to customers more quickly by using digital communication channels like WhatsApp Business, social media platforms as promotional tools, and sales management software. A number of real estate application platforms have also surfaced to streamline home ownership procedures in tandem with technological developments and Indonesia's sharp rise in smartphone usage (Anwar et al., 2024). Therefore, for real estate firms looking to stay competitive and sustainable in the digital age, digitalization is now a strategic must rather than just an optional tactic (Damai et al., 2024).

The way real estate firms handle transactions and client interactions has changed as a result of digitalization in marketing and sales. Through organized client databases and real-time communication, digital systems enhance data integrity, transparency, and operational efficiency in addition to speeding up sales (Jooste & Haque, 2022). Faster replies, a wider market reach, and more engaging interactions with potential customers are made possible by the usage of social media, online platforms, and digital communication technologies. Because of this, businesses who include digital technology into their sales operations have an advantage over those that only use traditional techniques. However, despite the fact that numerous studies address digital marketing for large real estate developers, there is still a dearth of regional research on medium-sized real estate firms (Sjahrudin et al., 2024). Specifically, there are still few empirical studies looking at the real-world use of digitization in businesses in the Sidoarjo region. Thus, the purpose of this study is to examine the practical implementation and effects of digitalization in PT. Dewe Makmur Mapan's sales process.

PT. Dewe Makmur Mapan, a Sidoarjo-based real estate firm, understands the value of integrating digital technology to enhance its business operations and sales initiatives. The business must constantly innovate in the face of fiercer competition in the local real estate market, especially by using digital technologies into its sales procedures. Digitalization is being implemented through the use of computer-based sales data recording systems, online platforms for property promotion, and digital communication tools to improve connections with potential clients (Barbosa, 2022). Through organized data management, these programs seek to increase worker productivity, expedite transaction procedures, reduce data recording errors, and facilitate more precise managerial decision-making (Kask et al., 2024).

Universitas Muhammadiyah Sidoarjo launched a community service program as part of an endeavor to empower the community through training and mentoring in order to support this digital revolution. The program's objectives were to enhance the company's human resources' abilities and capabilities in addition to supporting its digitization process. Observing current sales procedures, helping to optimize digital tools like Canva, Google Sheets, WhatsApp Business, and TikTok, producing promotional content, maintaining social media accounts, and carrying out organized digital follow-ups with potential customers were among the scheduled activities. In addition, training and direct mentoring were provided to improve participants' digital competencies, communication skills, creativity, adaptability, and professionalism. Through these activities, gained practical experience while contributing to strengthening the company's digital-based sales performance, and the community partners benefited from improved technical capabilities and soft skills necessary to support sustainable digital business practices.

Digitally stored sales data can be processed and analyzed to determine sales patterns, product demand, and customer preferences. This information serves as an important basis for management in formulating marketing strategies, setting pricing policies, and planning future product development. In this situation, implementing a comprehensive marketing strategy, using effective digital marketing, and increasing brand recognition are factors that must be considered to encourage consumer purchasing decisions (Althaf et al., 2025). By utilizing social media for marketing, it will certainly support business success, attracting consumer attention, so that it can reach a wider market. The current rapid growth of businesses is increasingly tightening competition in the market (Siahaan et al., 2025). Therefore, the implementation of digitalization not only contributes to improving sales performance, but also has an impact on improving the quality of business planning as a whole.

Theoretically, this research is grounded in the Marketing Mix (4P) concept, Relationship Marketing Theory, and the Technology Acceptance Model (TAM), which explain how digital marketing strategies and technology adoption can improve customer relationships, operational

efficiency, and organizational performance. These arguments provide credence to the idea that sales digitalization is a strategic method for boosting competitive advantage as well as a promotional tool. However, prior research has mostly concentrated on digital marketing in major corporations, giving little consideration to small and medium-sized real estate firms, especially when it comes to community service strategies. Furthermore, previous studies have seldom looked at how mentorship and training might improve human resource capability and digital adoption. This suggests a knowledge vacuum regarding the ways in which participatory digitalization might enhance workforce competencies and organizational performance.

Based on this gap, the goal of this community service project was to digitize PT. Dewe Makmur Mapan's property sales process in order to increase operational effectiveness, data management accuracy, and customer response. Additionally, this initiative increased the company's ability to manage digital promotions and organized client data while offering real-world experience. This article's innovation is how it combines training and mentorship with the application of digital marketing through a community service strategy, which helps small-scale real estate enterprises improve their digital preparedness, workflow management, and promotional efficacy.

IMPLEMENTATION METHOD

The planning of this community service activity was carried out using a participatory observation approach, where direct involvement in the field became an important part of the process. The program targeted management and staff who are actively engaged in sales activities at PT. Dewe Makmur Mapan. A total of twenty students from the Digital Business study program were involved in this initiative. The activity was conducted at the company's office, located in the Ruko Dewe Square Business Center, Sidoarjo, Indonesia. Its strategic position within a rapidly developing industrial and residential area makes this program both socially and economically significant, particularly in supporting the enhancement of digital capabilities within the local property sector. Five staff members, including one marketing coordinator and four sales administrators, participated in the training as management representatives and employees directly involved in sales and marketing activities.

This community service activity applied a qualitative descriptive method combined with a participatory observation approach, allowing for direct engagement with the partner organization. The Asset Based Community Development (ABCD) approach was employed to emphasize identifying and utilizing the existing strengths and resources within the organization. The program was carried out through several stages, namely socialization, education, training, and evaluation. During the socialization stage, the focus was on understanding the partner's needs and introducing the concept of digitalization. The education and training stages emphasized hands-on assistance, particularly in using digital tools such as social media platforms, customer data management systems, and digital communication applications. Finally, the evaluation stage was conducted to assess the effectiveness of digitalization in improving sales performance as well as enhancing overall operational efficiency.

Structured observation tools, such as activity checklists, field notes, and daily activity logs (internship diary), were used to gather data. Promotional strategies, customer response times, data management systems, the use of digital tools, and teamwork were all included in the observation checklist (Putra et al., 2025). Informal interviews with sales personnel and documentation of digital marketing outputs, including social media material, client databases, and follow-up records, were used to gather further information. Data confidentiality was upheld, and all operations were carried out with official authorization from business management (Tarquinio, 2021). In order to assess the effects of digitalization on efficiency, responsiveness, and data management structure, the data were descriptively evaluated by contrasting operating situations prior to and following digitalization (Aliy et al., 2024).

This community service program was carried out over a four-month period, from July to November 2025, in PT. Dewe Makmur Mapan, which is part of the community service program of Universitas Muhammadiyah Sidoarjo. The activities were organized into several structured phases to ensure a systematic implementation and measurable outcomes. During the preparation stage, participants were introduced to the company profile, property products, target market

segmentation, as well as existing sales and marketing processes. Initial observations were also conducted to understand current practices, including manual data recording, promotional strategies, customer response patterns, and follow-up processes for potential buyers. In the training and implementation stage, digital marketing strategies were applied through the use of social media platforms, customer data management systems, and digital communication tools, enabling a more efficient and modern approach to sales activities (Agung et al., 2025). This stage was designed to assist the partner in implementing digital technologies, increasing operational effectiveness, and boosting the efficacy of digital marketing initiatives.

Lastly, observations were conducted during the assessment stage to compare the circumstances prior to and during the adoption of digitalization. Indicators like the speed at which customer inquiries are answered, the quantity of digital interactions, the regularity with which material is published, and the arrangement of client data are the main focus of the evaluation. Figure 1 below outlines the process for carrying out community service projects.

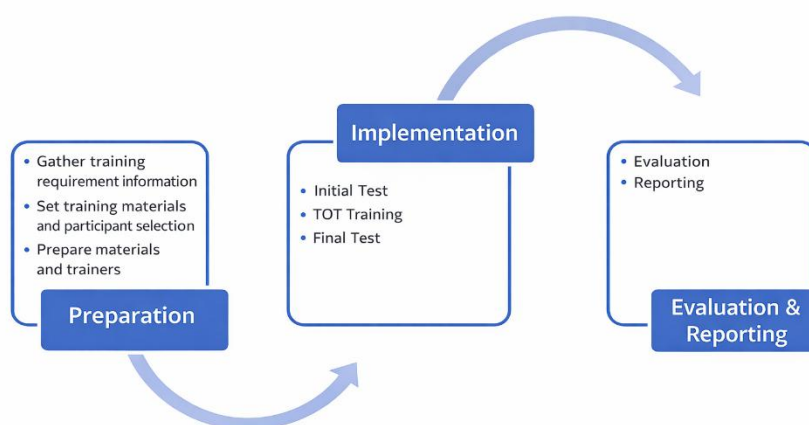


Figure 1. The diagram illustrates implementing a service program

This flowchart illustrates a structured approach to the community service program, which is divided into three main phases: preparation, implementation, and evaluation and reporting. These stages form a continuous cycle designed to ensure that the program carried out, at PT. Dewe Makmur Mapan, was effective, measurable, and delivered real impact, particularly in strengthening the organisation's capacity and performance in the digitalisation of marketing and customer service processes. The preparation phase began with gathering information about the company's initial conditions and identifying its training needs. This process involved close coordination with the management of PT. Dewe Makmur Mapan, along with direct observations in the field to identify key challenges, especially those related to the adoption and use of digital technology in property marketing and customer service (Ilyas et al., 2023). Following the identification of needs, pertinent training materials, delivery strategies, and program participants including firm employees and authors participating in community service projects were chosen. The group also made sure the mentors or instructors who would conduct the training were prepared and produced instructional materials and supplementary media. This planning phase is essential to making sure the program has specific goals and satisfies the demands of the partners.

The next stage was the implementation phase, which served as the core of the community service program. It began with an initial assessment to measure participants' basic understanding of digital media, particularly in the context of property marketing through platforms such as social media and communication applications. After that, Training of Trainers (TOT) aimed to improve participants' knowledge and skills in managing customer data, utilizing digital tools for marketing, and engaging effectively with potential customers online. During this phase, participants were provided with both theoretical insights and hands-on practice, including digital communication strategies, content creation for promotion, and simulations of using various digital platforms. At the end of the program, a final assessment was conducted to evaluate the participants' progress in terms of knowledge and skills. The results of the initial and final tests were then compared to measure the overall effectiveness of the training (Gunya et al., 2021).

The last phase, evaluation & reporting, attempted to gauge the community service program's overall effectiveness. Training results, such as participant skill development, engagement levels, and the program's influence on the business's operations, particularly with regard to marketing effectiveness and customer service were examined during the evaluation phase. In order to determine the program's advantages and disadvantages, participant and business feedback were also collected. The evaluation findings were then recorded in an organized and thorough activity report. This report served accountability for the community service projects and offers suggestions for creating programs of a similar nature in the future.

RESULTS

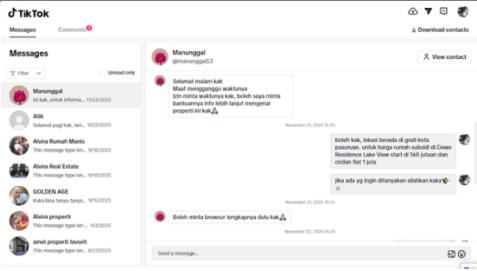
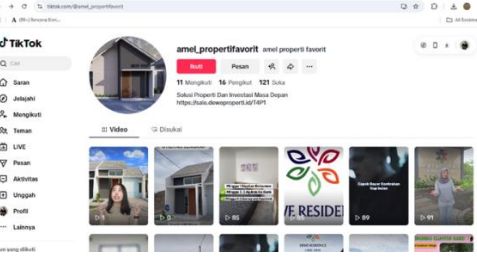
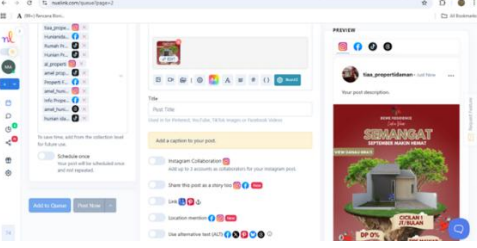
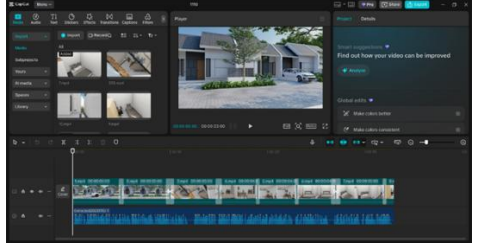
Results from community service activities demonstrate that the sales process has benefited from the digitalization. These days, social media promotions are more organized, interesting, and provide clear information, which increases contact with potential customers and broadens their reach. Social media and WhatsApp Business have made customer service replies quicker and more structured (Naeem et al., 2023). The authors were able to quickly respond to questions, give thorough property details, and follow up with prospective clients without experiencing any major delays. The participant demographic table is shown below.

Table 1. Participant Demographic

Variable	Category	Frequency (n)	Percentage (%)
Age	20–23 years	12	100%
Gender	Female	8	67%
	Male	4	33%
Education Level	Undergraduate (S1)	12	100%
Digital Marketing	Yes	4	33%
Experience	No	8	67%

Twenty participants aged between 20 and 23 participated in this community service initiative. This age range suggests that the people were primarily in the early adult stage, which is frequently linked to the acquisition of professional abilities and the ability to adjust to new technological developments. In terms of gender distribution, women made up 67% of the total, while men made up 33%. Each person's educational background was an undergraduate (S1) degree. This suggests that the participants already had a foundational academic background that may help them comprehend topics related to digital marketing and use technology in business operations. Nevertheless, disparities in experience with digital marketing techniques were noted in spite of this educational background. In terms of prior expertise with digital marketing, 33% of respondents had some prior experience, while the majority (67%) had no prior experience at all. This scenario implies that most people were still in the early stages of comprehending and putting digital marketing tactics into practice. Insufficient expertise in handling customer communications, maintaining digital platforms, and producing promotional content suggests the need for hands-on training and direct exposure to digital marketing tools and tactics. The results of the activities are shown in Table 2.

Table 2. Result of the Activities

Activity	Description
	Customer Service Interaction Through the TikTok Platform
	Managing a TikTok Account as a Property Digital Marketing Strategy
	Scheduling Property Promotion Content Uploads Through the Nuelink Website
	Property Video Content Production as a Digital Marketing Medium

The table lists a number of digital marketing initiatives completed as part of PT. Dewe Makmur Mapan's community service program. The utilization of digital channels to assist with customer communication and property marketing was the main emphasis of these operations. On TikTok, customer service was provided by answering questions from prospective buyers and offering details about real estate products. TikTok account management was used as a tactic to expand promotional reach and draw in more viewers with interesting content. Additionally, by organizing and automating the posting process, the Nuelink website's scheduling of property promotion content improved the consistency and effectiveness of marketing initiatives. In order to display property information in a more appealing and educational manner and raise public interest in the products supplied, property video material was also produced as a digital marketing tool. All things considered, these initiatives strengthened communication with potential clients and increased the efficacy of digital marketing. The outcomes of the internship project are displayed in the following table.

Table 3. Achievement of Results from the Internship Project

Main Aspects	Conditions Before Digitalization	Conditions After Digitalization	Main Impact
Promotion Through Social Media	The content is inconsistent and provides little information.	Scheduled, engaging, and informative content	Market area and interaction increases
Digital Response and Service	Slow response and messages not being noticed	Faster and more organized responses	Services become more professional and sales opportunities increase
Use of Digital Tools (Canva, Google Sheet, WA Business)	Tool usage is still low	Tools are used consistently	Work effectiveness and productivity increases
Follow-Up Potential Buyers	Unstructured and undirected data	Scheduled data-driven follow-up	Lead management is more efficient and closing opportunities increase
Promotional Material Quality	Limited and less interesting material	Varied and educational material	Promotions look more professional and competitive
Support for Marketing Team	Heavy workload and less effective	There is digital management support	Workload decreases and team performance increases

The outcomes of this community service program show that PT. Dewe Makmur Mapan's adoption of digitalization in the sales process was largely successful because of a number of contributing variables. First, medium sized real estate firms can employ digital tools like Canva, TikTok, Google Sheets, and WhatsApp Business since they are inexpensive and readily available (Dwivedi et al., 2021). Because of its simplicity, the marketing team was able to quickly adapt without the need for extensive financial commitment or sophisticated technical training. This result is consistent with other research showing that, when compared to traditional approaches, digital marketing tools increase operational effectiveness and lower promotional expenses (Stremersch et al., 2022). In line with the theoretical viewpoint covered in the Introduction about the strategic significance of digital platforms in boosting competitiveness, the organized usage of social media and digital databases also promotes increased transparency and quicker customer response. This activity shows that digitization at the agency level may be introduced incrementally through practical internship based support, in contrast to previous studies on digital marketing in East Javan property enterprises. This instance demonstrates how medium-sized real estate firms can also profit from straightforward digital integration in day-to-day sales activities, despite the fact that many studies focus on large-scale developers. The findings verify that digital platforms serve as efficient tools for client engagement, data management, and lead follow up in addition to being promotional channels (Shaikh & Al-rasheed, 2023).

This digitalization project has wider socioeconomic ramifications in addition to internal business advantages. Prospective purchasers in areas such as Sidoarjo, Buduran, and the neighbouring industrial zones can more easily access property information, including alternatives for affordable and subsidised housing, by maximising digital marketing. This promotes economic inclusion and increases information accessibility, especially for workers in growing residential and industrial areas (De et al., 2023). In this regard, digitalization promotes regional economic growth

and indirectly fortifies the local property ecosystem. Nevertheless, a number of restrictions were noted. The Analysis Pre-Post Test results are displayed in the following table.

Table 4. Analysis Pre-Post Test

No	Indicator	Respon	Before Activity	After Activity	Difference
1	Knowledge of social media management for property marketing	Yes	60%	82%	+22%
2	Understanding of responding to customers through digital platforms	Yes	58%	85%	+27%
3	Ability to create digital promotional content	Yes	62%	88%	+26%
4	Understanding of managing prospective buyer data digitally	Yes	55%	80%	+25%
Average			58,4%	83,6%	+25.2%

Following the implementation of the community service activities, the results demonstrate a notable development in digital marketing competencies. The average comprehension level before the training was 58.4% for all metrics. The average score rose to 83.6% following the training and mentoring procedure. The use of digital tools such as Canva, WhatsApp Business, and Google Sheets effectively supports promotional activities, speeds up customer communication, and enhances the management of sales data in a more organized manner, as evidenced by the greatest improvement in digital content creation and customer service response (Hafeez et al., 2025). The following table shows the results of the Implementation of Activities

Table 5. Implementation of Activities

No	Indicator	Fair	Good	Verry Good
1	Material delivered	3 (9%)	21 (60%)	11 (31%)
2	Speaker's delivery ability	2 (6%)	18 (51%)	15 (43%)
3	Facilities provided	10 (29%)	20 (57%)	5 (14%)

The evaluation's findings demonstrate how well the community service initiatives were welcomed overall. The majority of replies assessed the material delivery as good (60%) and very good (31%), suggesting that the information was clear and pertinent. 51% of respondents rated the speaker's ability to present the topic as good, and 43% rated it as very good. In the meantime, most respondents (57%) rated the facilities used during the activity as good, indicating that they were deemed adequate. Overall, the findings show that the activity's execution was successful and aided in the learning process.

DISCUSSION

PT. Dewe Makmur Mapan's use of digitization in real estate sales shows a notable improvement in organizational capacity, operational efficiency, and marketing efficacy. Four key areas, social media management, customer service response, digital content development, and data management showed improvements based on the pre-test and post-test indicators. More organized and appealing promotional operations have been made possible by the use of digital platforms like TikTok and content editing software like CapCut. These tools make it possible to reach a larger audience and disseminate promotional information more regularly, which

eventually boosts marketing efficacy and visibility. The promotion component of the Marketing Mix theory, which highlights the significance of efficient communication channels in providing customers with product value, is supported by this research. Compared to traditional marketing strategies, digital platforms allow real estate firms to access larger market segments and carry out promotional activities more effectively.

The idea of Relationship Marketing Theory, which emphasizes the value of interactive connection between companies and customers, is supported in terms of customer service response by the use of TikTok's direct messaging tool. Potential customers' questions can be answered more rapidly and effectively with this platform. Prospective clients can readily obtain information by using digital communication channels to provide details about property locations, prices, and available housing kinds. Building client trust and enhancing service quality through quicker responses and ongoing communication can boost engagement and motivate prospective purchases (Situasi, 2025). After the initiative was put into place, digital content creation also significantly improved. Short property videos and visual advertising designs were created as promotional materials, enhancing the presentation of the information and making it easier to comprehend. Promotional content can be produced more quickly without sacrificing visual quality by using basic digital design tools. The company's digital branding is strengthened by this action, which also raises audience interest in the available real estate items.

Data management is another crucial component, especially when it comes to handling sales records and information about potential customers. Digital spreadsheets are used to record sales and customer inquiry data, making it possible for the marketing team to easily access and organize the information. Customer names, contact details, property interests, and the status of follow up communications are all recorded in this system. The marketing team may better track inquiries, track the progress of potential customers, and evaluate marketing performance by storing sales data digitally. Additionally, when following up with potential customers, structured data management enhances team member collaboration and lowers human errors. According to the Technology Acceptance Model (TAM), the usage of digital technologies in data management and marketing illustrates how perceived utility and usability promote the adoption of technology in organizational operations. Digital tools for content scheduling and sales data recording facilitate workflow organization, enhance job collaboration, and boost overall operational effectiveness. These gains show that digitalization enhances organizational management and preparedness for digital transformation in addition to improving marketing success (Feng et al., 2021).

From an economic and business empowerment standpoint, this community service initiative helps local real estate companies become more digitally capable, which is crucial for them to stay competitive in the age of the digital economy. The organization may broaden its market reach, boost potential customer involvement, and promote business sustainability with enhanced digital marketing skills. Additionally, by enhancing digital skills, communication abilities, and adaptation to technology-based work systems all crucial competences in contemporary business environments the curriculum advances human resource development. By improving a number of important indicators of digital marketing competencies, the execution of this community service project also helps to achieve Sustainable Development Goals 8 (Decent Work and Economic Growth) and 9 (Industry, Innovation, and Infrastructure). The integration of digital capability development with sustainable economic and technological improvement is reflected in each program success indicator. First, by enhancing digital competences that facilitate more efficient and successful marketing initiatives, social media management for real estate marketing has improved, reflecting the contribution to SDG 8. Through more effective marketing techniques, social media platform management enables real estate companies to broaden their market reach, boost promotional visibility, and enhance economic prospects.

Second, by enhancing service effectiveness and fortifying commercial ties with prospective customers, the enhanced capacity to reply to clients via digital channels further advances SDG 8. Customer satisfaction and trust are increased by quicker and more responsive contact via digital channels, which can raise the possibility of business expansion and long-term revenue development. Third, the advancement in the production of digital promotional content shows a clear link to SDG 9, which places a strong emphasis on industry innovation and technical advancement. The combination of technology and creativity in contemporary marketing practices

is reflected in the production of more eye-catching and educational promotional materials made possible by the use of digital design and video editing tools. Fourth, the deployment of digital infrastructure in company operations contributes to SDG 9 by improving the capacity to manage prospective buyer data digitally. The use of digital spreadsheets for recording and organizing customer data supports more systematic data management, improves coordination within the marketing team, and facilitates better

All things considered, the combination of these four metrics social media management, customer service responsiveness, digital content production, and digital data management shows how digitalization enhances marketing performance while also fostering technological innovation and sustainable economic growth. This activity increases organizational capacity, boosts business efficiency, and promotes the creation of more flexible and sustainable business processes in the real estate industry through the adoption of digital tools and enhanced digital competences.

CONCLUSIONS

The goal of PT. Dewe Makmur Mapan's community service program aims to assist with the digitalization of property marketing and sales operations to enhance operational efficiency, customer service quality, and promotional effectiveness. This activity strengthens the generation of digital promotional content, social media management, customer care responses via digital platforms, and more organized prospective buyer data management. A larger market can be reached by using digital platforms like TikTok, content processing software, and spreadsheet based data recording tools to make marketing efforts more methodical and consistent. Additionally, digital customer data management facilitates more informed decision-making based on accessible data, enhances marketing team coordination, and streamlines sales prospect tracking.

All things considered, the use of digital marketing in real estate sales has improved the accuracy of sales data management, increased promotional effectiveness, and sped up communication with potential buyers. Adopting a sustainable digital marketing strategy is expected to boost the business's competitiveness in the digital economy and help create a more creative, effective, and long-lasting marketing system. This activity can be a strategic step toward expanding real estate businesses and raising customer service standards by leveraging digital technologies and effective resource management.

ETHICAL CONSIDERATIONS

Not applicable.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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AUTHOR CONTRIBUTIONS

The authors contributed collaboratively to the planning, implementation, data collection, analysis, and preparation of this article. All stages of the community service program, including conceptualization, field activities, evaluation of results, and manuscript writing, were carried out jointly. Authors have reviewed and approved the final version of the article. Nitya Amelia was responsible for initiating the study concept, designing the community service program, and organizing the implementation of field activities. Bayu Hari Prasajo contributed to data collection, data analysis, and the preparation of tables and supporting materials. Both authors collaborated in interpreting the results, writing and revising the manuscript, and ensuring the accuracy and completeness of the article. All authors contributed to revising and approving the final manuscript.

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