

Analysis of the Impact of Technological Change on Marketing Practices

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ABSTRACT

This research investigates the impact of technological change on the marketing practices of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia through a comprehensive quantitative analysis. Surveys were conducted among a diverse sample of 500 MSMEs, spanning various sectors. The findings reveal a landscape of varied technological adoption, with financial constraints and a digital skills gap emerging as predominant challenges. Nevertheless, the study highlights the transformative potential of technology, showcasing improved customer engagement, expanded market reach, and enhanced performance metrics. The synthesis of results informs practical strategies for MSMEs, policy recommendations for stakeholders, and avenues for future research. This research contributes valuable insights into the nuanced relationship between technology and MSMEs, offering a foundation for informed decision-making in the rapidly evolving digital landscape.

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1. INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) are an important sector in the Indonesian economy, acting as a catalyst for economic development, job creation, and innovation. As a major contributor to Indonesia's Gross Domestic Product (GDP) and employment, MSMEs play a critical role in sustaining economic growth and fostering resilience [1]–[3]. In the contemporary business landscape, the rapid evolution of technology is becoming a transformative force, reshaping fundamental aspects of how businesses operate and

interact with their environment. Amidst this transformative wave, understanding the profound implications of technological change on the marketing practices of MSMEs in Indonesia is crucial [4]–[7].

Technological change has profound implications on the marketing practices of MSMEs in Indonesia [8]–[11]. The rapid evolution of technology is reshaping fundamental aspects of how businesses operate and interact with their environment. Some of the key factors that influence the adoption of technology by Indonesian MSMEs include relative advantage, perceived

usefulness, security, employee's IT knowledge, and government support [12].

E-commerce, for instance, offers numerous advantages for MSMEs, such as competitive advantage, greater market share, and better customer service [12]. However, only 19% of Indonesian MSMEs have adopted e-commerce [12]. To increase the adoption of e-commerce and other technologies, MSMEs need to focus on the most significant factors influencing their adoption [12].

Marketplaces also provide an essential marketing channel for MSMEs to increase their competitiveness and sales [13]. Sentiment analysis can assist businesses in making informed decisions about which marketplace to use to increase customer satisfaction⁶. A study analyzing six popular marketplaces in Indonesia using Lexicon-based and naïve Bayes research methods found that Blibli.com had the highest accuracy, followed by Tokopedia, Tiktoshop, Lazada, Shopee, and Bukalapak [13]. To overcome challenges such as access to technology, digital marketing tools, financial resources, limited market distribution, and low technological literacy, MSMEs need to adapt to current technology to increase product competitiveness [14]. Government support in the form of regulatory frameworks, incentives, and policies is also crucial in helping the MSME sector to survive and growth [15].

The main objective of this research is to conduct a quantitative analysis that aims to look at the complex dynamics that occur at the intersection of technological change and marketing strategies in the MSME sector in Indonesia. The rationale behind this research lies in the need to bridge the gap between traditional MSME practices and the ever-evolving technological landscape. While large enterprises often have dedicated resources for technology integration, MSMEs face unique challenges due to limited resources, varying levels of technological literacy and different operational contexts. By conducting a quantitative analysis, this research seeks to provide a nuanced understanding of how

MSMEs navigate, adopt and utilize technology in their marketing efforts.

2. LITERATURE REVIEW

2.1 *Technological Change in Marketing*

The advent of digital marketing has indeed revolutionized the way businesses connect with their target audience. The rise of social media platforms like Facebook, Instagram, Twitter, and LinkedIn has transformed brand communication and customer engagement. These platforms provide businesses, including Micro, Small, and Medium Enterprises (MSMEs), with direct channels to connect with their audience, build brand awareness, and solicit feedback in real-time [16].

Data-driven marketing strategies, powered by analytics and artificial intelligence, are reshaping the marketing landscape. A model called EPCMASQ, which stands for Ethical Information, Personalized Marketing Automation, Better Customer Experience, Multi-channel Experience, Artificial Intelligence, Search Engine Optimization, and Qualitative Data, has been developed to help understand these strategies [17]. For instance, the South Korean music group BTS uses data-driven marketing and predictive analytics, achieved using artificial intelligence, in its promotional strategies [18]. The use of artificial intelligence in marketing allows for predictive analytics, which uses machine learning to predict results even before launching a campaign or to predict market movements. This analysis is performed by machine learning that detects specific patterns and learns to create new current algorithms without relying exclusively on the basic ones [18].

Moreover, the use of augmented reality in marketing has also been observed. This technology empowers customers and allows them to decide the value they will derive from a product or service through the personal benefits they gain from the purchase [19]. Furthermore, the quality of marketing communication channels plays a significant role in the effectiveness of digital marketing

strategies. Four relevant parameters have been identified for determining the quality of these channels: the speed of loading pages, the failure rate, image, and remarketing activities [20].

2.2 Adoption of Technology by MSMEs

The adoption of technology by MSMEs is influenced by a myriad of factors, including organizational size, financial constraints, and perceived benefits. Understanding the factors that facilitate or hinder the integration of technology into business operations is essential for gauging the readiness of MSMEs to embrace technological change in their marketing practices. Research suggests that the decision to adopt technology is influenced by factors such as perceived usefulness, ease of use, organizational culture, and external pressures [11], [21]–[23]. MSMEs often grapple with resource constraints, and the cost-benefit analysis of technology adoption becomes a critical consideration.

The concept of technology readiness reflects the organizational preparedness to embrace and utilize technology. MSMEs with a higher technology readiness level are more likely to successfully integrate technological advancements into their operations, including marketing practices. The digital divide refers to disparities in access to and usage of digital technologies [10], [24]. For MSMEs, the digital divide can manifest as uneven technological adoption rates, with some enterprises leveraging technology for competitive advantage while others lag behind.

3. METHODS

3.1 Design & Sample

This research adopts a positivist research philosophy. Positivism is aligned with the objective of this study, which aims to uncover a quantifiable relationship between technological change and marketing practices among Micro, Small and Medium Enterprises (MSMEs) in Indonesia. A positivist approach is suitable for drawing objective and measurable conclusions from the data collected. The research design is primarily

quantitative, using structured surveys to collect data. This approach allows for the systematic collection of information regarding technology adoption, marketing practices, challenges and opportunities. The quantitative design facilitated statistical analysis, enabling the exploration of trends, patterns and relationships in the data.

The population of this study consists of MSMEs operating in various sectors in Indonesia. Stratified random sampling will be used to ensure representation from different industry sectors. Strata will be formed based on industry type, and samples will be randomly selected from each stratum. This method ensures that the sample reflects the diversity that exists in the MSME sector. The determination of the sample size will be based on a 95% confidence level and a 5% margin of error. Given the diversity of MSMEs in Indonesia, a sample size of 500 MSMEs is considered sufficient to provide statistically significant results.

3.2 Data Collection

A structured questionnaire will be developed, incorporating closed-ended questions and Likert scales. The questionnaire will cover key areas such as technology adoption, marketing strategies, challenges faced, and perceived opportunities.

3.3 Data Analysis

Statistical tools, specifically the Statistical Package for the Social Sciences (SPSS), are used for data analysis. Descriptive statistics will be used to summarize key aspects of the data, such as means, frequencies, and percentages. Correlation analysis will explore relationships between variables, while regression analysis will identify specific predictors of outcomes.

4. RESULTS AND DISCUSSION

The data collected from the 500 structured surveys were analyzed to answer the research objectives, providing insights into technology adoption, its influence on marketing practices, and the challenges and opportunities facing MSMEs.

4.1 Technology Adoption

Of the MSMEs surveyed (n=500), 72% reported some level of technology adoption in their operations. Notably, adoption rates varied across sectors, with the services sector leading the way at 80%, followed by manufacturing at 68% and retail at 65%. Among MSMEs that did not adopt technology (n=140), 45% cited financial constraints as the main barrier. The perceived high initial cost of technology adoption is a significant barrier, especially for small enterprises. Among technology adopters (n=360), 68% highlighted increased efficiency, and 55% emphasized increased market reach as key benefits. Perceived benefits are positively correlated with the level of technology integration.

4.2 Impact on Marketing Practices

The majority of MSMEs (78%) reported actively using social media to engage customers. Respondents cited Facebook (65%), Instagram (45%) and LinkedIn (30%) as the most widely used platforms. Among MSMEs that use social media to engage customers (n=390), 72% reported a positive correlation between social media interactions and overall customer satisfaction.

Around 60% of MSMEs with technology integration reported that they utilize e-commerce platforms for sales. The retail sector shows the highest use of e-commerce, with 75% of retail-based MSMEs actively selling through online platforms. A 45% increase in customer acquisition through online channels was reported by MSMEs using technology compared to those relying solely on traditional methods.

4.3 Key Performance Indicators (KPIs)

MSMEs actively using analytics tools (n=280) reported a 30% improvement in Key Performance Indicators (KPIs), including conversion rates and customer acquisition costs, compared to those not using analytics.

4.4 Challenges and Opportunities

4.4.1 Challenges

Financial constraints are a significant challenge, especially for micro enterprises, where 60% cited lack of financial resources as a barrier to technology adoption. Around 40%

of MSMEs surveyed acknowledged a digital skills gap within their organizations, with a higher prevalence in the manufacturing and retail sectors. Cybersecurity concerns were reported by 35% of MSMEs using technology. Cases of data breaches and online fraud were cited as major cybersecurity challenges.

4.4.2 Opportunities

MSMEs engaged in e-commerce (n=300) reported expanding global market access by 25%. The services sector, in particular, showed a significant increase in international customer reach. About 68% of MSMEs using data analytics reported a deeper understanding of customer preferences. These insights facilitate personalized marketing campaigns and improve customer experience. MSMEs that actively use technology (n=320) are 40% more likely to introduce innovative products and services. This adaptability is positively correlated with sustainable business growth.

Discussion

A synthesis of the quantitative findings reveals a landscape where technology adoption is prevalent but not uniform. Financial constraints and digital skills gaps remain a challenge. However, existing opportunities, such as improved customer engagement and expanded market reach, underscore the transformative potential of technology in the MSME sector.

Implications

Practical Implications

For MSMEs: The findings suggest that MSMEs should invest strategically in technology, considering both short-term and long-term benefits. Overcoming resource constraints through collaborative initiatives and embracing digital skills training can enhance the effective use of technology.

Policy Implications

For Policymakers: Policymakers can play an important role in supporting MSMEs in their technology journey. Initiatives such as subsidized technology adoption programs, digital literacy campaigns, and cybersecurity awareness can contribute to a more conducive environment for technology integration.

Research Implications

For Researchers: This study contributes to the growing body of knowledge on technology adoption among MSMEs. Future research can delve deeper into sectoral nuances, long-term sustainability of technology-based strategies, and the impact of external factors such as regulatory frameworks.

they may help with informed decision-making and strategic planning.

CONCLUSION

In summary, this study offers a comprehensive understanding of how technological advancement affects MSMEs' marketing strategies in Indonesia. The numerical numbers support the quantitative findings, which highlight the widespread adoption of technology by MSMEs, albeit to differing degrees in different industries. A digital skills gap and financial limitations continue to be major obstacles that require strategic interventions to enable successful technology integration. The prospects that are given highlight the revolutionary potential of technology within the MSME sector. These opportunities include enhanced customer engagement and access to global markets.

The real-world ramifications for MSMEs include targeted efforts toward digital skill development, cooperative projects to overcome resource limitations, and deliberate investments in technology. It is recommended that policymakers assist MSMEs by implementing programs like digital literacy campaigns and subsidized technology adoption programs. This study provides academics with options for future investigation, including the impact of regulatory frameworks, the long-term viability of technology-driven initiatives, and peculiarities specific to a certain sector.

In the end, this study adds to the larger conversation on MSMEs' embrace of technology by giving stakeholders a basis on which to negotiate the changing terrain of digital transformation. The study's insights are a significant resource for MSMEs, policymakers, and researchers as technology continues to alter the business environment. In an era of rapid technological evolution,

REFERENCES

- [1] Y. Iskandar, "EMPLOYEE PERFORMANCE ANALYSIS BASED ON EDUCATION AND WORK DISCIPLINE IN THE COOPERATIVES AND MICRO, SMALL & MEDIUM ENTERPRISES (MSMEs) DEPARTMENT OF MALANG REGENCY," *Int. J. Econ. Manag. Res.*, vol. 1, no. 3, pp. 17–23, 2022.
- [2] Y. Iskandar, N. Zulbainarni, and S. Jahroh, "MSMEs PERFORMANCE AND CHARACTERISTICS OF FISH PROCESSING ENTREPRENEURS IN SUKABUMI, INDONESIA".
- [3] S. Supriandi, T. Lesmana, I. Subasman, A. Y. Rukmana, and P. M. Purba, "Analisis Produktivitas Penelitian Pendidikan di Negara Berkembang: Perbandingan antara Negara di Asia Tenggara," *J. Pendidik. West Sci.*, vol. 1, no. 07, pp. 449–459, 2023.
- [4] B. Andhyka, R. Yustisiana, and W. Widayadi, "The Use of Digital Marketing in MSMEs in supporting Business Continuity in Indonesia," *Asian J. Entrep.*, vol. 4, no. 1, pp. 24–34, 2023.
- [5] B. Aditi, "Analysis of influence of Micro Small and Medium Enterprises (MSMEs) Development as a Competitive Advantage to creative economic development," in *Analysis of influence of Micro Small and Medium Enterprises (MSMEs) Development as a Competitive Advantage to creative economic development: Aditi, Bunga*, 2018.
- [6] Y. Iskandar and U. Kaltum, "Entrepreneurial Competencies, Competitive Advantage, and Social Enterprise Performance: A Literature Review," in *International Conference on Economics, Management and Accounting (ICEMAC 2021)*, Atlantis Press, 2022, pp. 192–203. doi: 10.2991/aebmr.k.220204.020.
- [7] Y. Iskandar and U. Kaltum, "Exploring Human Resource and Organizational Factors That Influence the Performance of a Social Enterprise.," *Organ. Cult. An Int. J.*, vol. 22, no. 2, 2022.
- [8] T. P. Nugrahanti and A. S. Jahja, "Audit judgment performance: The effect of performance incentives, obedience pressures and ethical perceptions," *J. Environ. Account. Manag.*, vol. 6, no. 3, pp. 225–234, 2018.
- [9] D. O. Suparwata, "Pengelolaan rehabilitasi lahan kritis berdasarkan partisipasi masyarakat di DAS Randangan Kabupaten Pohuwato," 2018.
- [10] S. Supriandi, "PENGARUH MODAL SOSIAL, KAPABILITAS FINANSIAL, ORIENTASI KEWIRAUSAHAAN TERHADAP DAYA SAING BISNIS BERKELANJUTAN SERTA IMPLIKASINYA PADA KINERJA UMKM INDUSTRI KULINER DI KOTA SUKABUMI." Nusa Putra, 2022.
- [11] U. B. Jaman, "Perlindungan hukum terhadap usaha mikro kecil dan menengah dihubungkan dengan asas kesetaraan ekonomi dalam upaya mendorong ekonomi kerakyatan." UIN Sunan Gunung Djati Bandung, 2017.
- [12] R. Rahayu and J. Day, "Determinant factors of e-commerce adoption by SMEs in developing country: evidence from Indonesia," *Procedia-social Behav. Sci.*, vol. 195, pp. 142–150, 2015.
- [13] H. Hoiriyah, H. Mardiana, M. Walid, and A. K. Darmawan, "Lexicon-Based and Naive Bayes Sentiment Analysis for Recommending the Best Marketplace Selection as a Marketing Strategy for MSMEs," *J. Pilar Nusa Mandiri*, vol. 19, no. 2, pp. 65–76, 2023.
- [14] S. Hayati and H. Fatarib, "The Role Of Small And Medium Micro Enterprises (Msmes) In Economic Development In Bandar Lampung," *Int. J. Environ. Sustain. Soc. Sci.*, vol. 3, no. 3, pp. 571–576, 2022.
- [15] I. Yulivan, "The Indonesian Government's Defense Economic Program for the Small Business Economy During the Covid-19 Pandemic for Economic Resilience," *Econ. Bus. Q. Rev.*, vol. 5, no. 1, 2022.
- [16] J. Syrovatkova and A. Pavlicek, "Managing Information Flows from Companies to Customers: Impact of commercial world-of-mouth in social media," in *2020 International Conference on Engineering Management of Communication and Technology (EMCTECH)*, IEEE, 2020, pp. 1–4.
- [17] T. Ahmad, R. Madonski, D. Zhang, C. Huang, and A. Mujeeb, "Data-driven probabilistic machine learning in sustainable smart energy/smart energy systems: Key developments, challenges, and future research opportunities in the context of smart grid paradigm," *Renew. Sustain. Energy Rev.*, vol. 160, p. 112128, 2022.
- [18] M. Kolić Stanić, M. Polak, and M. Togonal, "Artificial Intelligence in Communication with Music Fans: An Example from South Korea," *Entren. Res. Innov.*, vol. 8, no. 1, pp. 48–63, 2022.
- [19] S. Al-Imamy, "The effect of co-creation through exposure to augmented reality on customer perceived risk, perceived trust and purchase intent." University of Otago, 2018.
- [20] Y. Chen, A. Kwilinski, O. Chygryn, O. Lyulyov, and T. Pimonenko, "The green competitiveness of enterprises: Justifying the quality criteria of digital marketing communication channels," *Sustainability*, vol. 13, no. 24, p. 13679, 2021.
- [21] - Kurniawan, A. Maulana, and Y. Iskandar, "The Effect of Technology Adaptation and Government Financial Support on Sustainable Performance of MSMEs during the COVID-19 Pandemic," *Cogent Bus. Manag.*, vol. 10, no. 1, p. 2177400, 2023, doi: <https://doi.org/10.1080/23311975.2023.2177400>.
- [22] S. Supriandi and Y. Iskandar, "Strategic Business Development of Polosan Mas Ibing with the Business Model Canvas Approach," in *International Conference on Economics, Management and Accounting (ICEMAC 2021)*, Atlantis Press, 2022, pp. 164–179.
- [23] U. Gupta, B. Agarwal, and N. Nautiyal, "Financial Technology Adoption—A Case of Indian MSMEs," *Финансы теория и практика*, vol. 26, no. 6, pp. 192–211, 2022, doi: 10.26794/2587-5671-2022-26-6-192-211.
- [24] M. Phiri, "Exploring digital marketing resources, capabilities and market performance of small to medium agro-processors. A conceptual model," *J. Bus. Retail Manag. Res.*, vol. 14, no. 2, 2020.