

## DIGITAL MARKETING MODEL FOR MSMEs IN GARUT REGENCY USING A DYNAMIC SYSTEM

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**Abstract.** Micro, Small and Medium Enterprises (MSMEs) in Garut Regency increase 6% annually. This increase proves that more and more MSMEs can innovate and compete among MSMEs. There are many MSME sectors, such as industrial to culinary UMKM. Along with the rapid development of technology, everyone must put it to good use. The existence of Digital Marketing is an opportunity for MSMEs to expand their marketing network. MSMEs need to understand Digital Marketing in order to survive and progress amid digital competition and increasingly advanced technology. The background of this research is digital marketing for SMEs, especially SMEs in Garut Regency. Understanding and using Digital Marketing needs to be understood by every MSME so that they can survive and get more and more profits. The research sample was conducted by interviewing 10 UMKM Garut Regency in the Culinary field. This sample has met the MSME criteria from the use of Digital Marketing and MSME income. This research method uses a dynamic system starting from system definition, making causal loop diagrams, making stock and flow diagrams, then validating and verifying dynamic system models. Based on the results of the research, digital marketing affects two important things, namely viewers of the content that we offer regarding products and also costs for digital marketing itself so that optimization of these two things can control digital marketing output, namely sales or transactions (sales). Apart from that, UMKM Perceptions of Digital Marketing must understand Digital Marketing itself so that the impact will be better in accordance with the targets of the MSME itself.

**Keywords:** Culinary, Digital\_marketing, MSME, System Dinamic

### I. INTRODUCTION

MSMEs (Micro, Small, and Medium Enterprises) refer to business units owned by individuals or certain legal entities. According to Databoks, in 2019 the number of MSMEs in Indonesia reached 65.5 million enterprises. Compared to 2018, this figure increased by 1.98% from 64.2 million business units. In more detail, the number of micro enterprises in 2019 reached 64.6 million units, while approximately 798.7 thousand units were classified as small enterprises (Jayani, 2021). The role of MSMEs is indeed very important for the Indonesian economy. MSMEs contribute significantly to regional Gross Domestic Product (GDP). Based on Databoks data, the contribution of MSMEs to Indonesia's GDP from 2015 to 2019 amounted to IDR 9,062.6 trillion, representing an increase of 5.7%

compared to the previous year. MSMEs also play a major role in employment absorption, employing approximately 119.6 million workers, or 96.92% of the total workforce in Indonesian business units, with an increase of 2.21% from 2018 (Jayani, 2021). These figures clearly demonstrate that MSMEs have a crucial role in Indonesia's economic activities. In Garut Regency, there are numerous MSMEs operating across various industrial sectors, such as the leather industry, culinary businesses, and others. Based on data accessed from the Open Data portal of West Java Province, the situation can be described as figure 1.

Based on MSME data in Garut Regency, it can be observed that from 2016 to 2021 there was an annual increase of approximately 6% in the number of MSME units. With a total of 349,863 MSMEs recorded in 2021, this growth

indicates that competition among MSME actors has become increasingly intense. At the same time, the large number of MSMEs also represents significant potential to further stimulate economic development in Garut Regency [1].

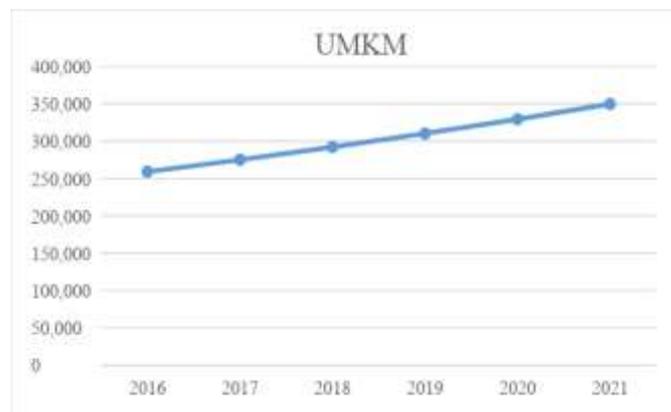


Figure 1. MSME Curve of Garut Regency

According to the Head of the Industry and Trade Office (Disperindag) of Garut Regency, as stated in an interview reported by Lutfhi, the purpose of organizing related activities was to ensure that business actors understand how to market their products through digital marketing. One of the main points emphasized was encouraging MSME actors to collaborate with electronic marketplaces (e-commerce platforms). Furthermore, the Head of Disperindag explained in the same interview [2], that business actors must understand how to produce proper product photographs and videos, as well as develop appropriate strategies to collaborate with local and even international e-commerce platforms. Digital marketing is defined as a series of marketing activities, including branding, that utilize various digital media. Examples include blogs, websites, email marketing, AdWords, and social media networks [3].

In general, a common problem faced by MSME actors in Garut Regency is the lack of understanding of how to market products through digital marketing. Many business actors are not yet accustomed to using digital marketing tools, particularly e-commerce platforms. E-commerce, or electronic commerce, refers to the buying and selling of goods and services conducted via the internet (online). Despite the significant potential offered by digital marketing through e-commerce and social media platforms, MSME actors with limited technological literacy often experience difficulties in understanding and utilizing these tools. In contrast, younger entrepreneurs who are already familiar with technology typically only require additional support in terms of marketing strategies and product innovation. Given the rapid pace of technological development, MSME actors are inevitably required to adopt digital technologies; otherwise, they risk being left behind. This issue is commonly encountered among MSME actors both in Indonesia in general and in Garut Regency in particular.

Considering the crucial role of MSMEs in the economy, guidance and support from the government are essential to ensure sustainable economic growth. As digital marketing should now be regarded as a standard practice for MSME product promotion, business actors must be more careful and knowledgeable in its implementation. Therefore, this study examines digital marketing practices among MSMEs using a System Dynamics modeling approach. System dynamics is a modeling method that explains components within complex systems by describing interrelationships, feedback loops, data flows, time delays, and nonlinear behavior within subsystems. It is also closely related to systems thinking, which requires a holistic perspective when analyzing complex problems. In this study, system dynamics is employed to test a digital marketing model for MSMEs in Garut Regency. The following section presents several MSMEs in Garut Regency operating in the food or culinary sector as part of the overall MSME population in the region.:

Table 1. Culinary MSMEs in Garut Regency

No	Business Name	Main Product	Digital Media Used	Average Turnover (Rp)
1	Cancimen Food	Cuanki Ramen	TikTok, Shopee, Lazada, Bibli, Facebook, Instagram, WhatsApp	35,000,000
2	Croffle Dunk	Croffle	Instagram, TikTok, GrabFood, GoFood	10,000,000
3	Burayot Simadu	Burayot	Instagram, Facebook, TikTok, Shopee, Lazada	80,000,000
4	Baso Yulaajat	Various Meatballs	Shopee, Lazada, Instagram, Facebook	5,000,000
5	Tuang Rung	Squid, Tareng, and others	Instagram, WhatsApp, Shopee, TikTok	20,000,000
6	Jajanken Weh	Dimsum	Instagram, WhatsApp, GoFood, Shopee	8,000,000
7	GALA Garut	Various Cuanki Products	Shopee, Tokopedia, Bukalapak, Instagram, Facebook, TikTok	250,000,000
8	Jajanan Menak	Moring	WhatsApp, Instagram, Shopee	1,500,000
9	Habisin Id	Chicken Rice	Instagram, WhatsApp	2,000,000
10	Pentol DoWer	Pentol	Instagram, Facebook, TikTok, YouTube, GrabFood, GoFood	20,000,000
Average				43.150.000

## II. RESEARCH METHODS

This study employed a descriptive research design using a System Dynamics approach to analyze the impact of digital marketing on the sales performance of Micro, Small, and Medium Enterprises (MSMEs) in Garut Regency. The research focused on culinary MSMEs that actively utilize digital marketing platforms such as social media and online marketplaces. Primary data were collected through semi-structured interviews with ten selected MSME owners to obtain information related to digital marketing practices, viewer engagement, marketing costs, and sales performance. Secondary data were gathered from official government reports, MSME databases, and relevant academic literature.

The System Dynamics method was applied to identify causal relationships among key variables, including digital marketing, viewers, cost, demand, competition, and sales. These relationships were first represented in a causal loop diagram and then transformed into a stock and flow diagram to simulate system behavior over time. The simulation was conducted using an annual time interval to project sales performance over a ten-year period. Model verification and validation were carried out by comparing simulation results

with empirical data obtained from MSME interviews. This approach enables a comprehensive understanding of how digital marketing activities influence sales growth and provides strategic insights for optimizing digital marketing implementation among MSMEs [4], [5].

### III. RESULT AND DISCUSSION

The results of this study were obtained from the System Dynamics simulation model developed to analyze the relationship between digital marketing and sales performance of culinary MSMEs in Garut Regency. The model integrates key variables such as digital marketing intensity, viewers, marketing cost, demand, competition, and sales as the main output variable. Simulation was conducted using an annual time horizon to project sales performance over a ten-year period. The simulation results indicate that digital marketing functions as a critical driving force that directly influences sales growth. In the early years of implementation, sales performance shows moderate growth, reflecting the adjustment phase in which MSMEs are still optimizing digital marketing strategies. As digital marketing activities become more structured and consistent particularly in terms of content creation, platform selection, and budget allocation the sales trajectory demonstrates a significant upward trend.

The projected results show that sales increase progressively over time when digital marketing performance remains stable and controlled. Viewer growth contributes positively to sales by expanding product exposure and increasing the probability of transactions. However, the model also reveals that uncontrolled increases in digital marketing costs can reduce efficiency and slow sales growth if not balanced with viewer engagement and conversion rates. These findings highlight the importance of managing both viewer reach and cost efficiency in digital marketing implementation.

The findings confirm that digital marketing plays a strategic role in improving MSME sales performance, particularly when analyzed using a System Dynamics perspective. The positive feedback loop between digital marketing and sales indicates that increased marketing exposure leads to higher viewer engagement, which in turn stimulates sales growth. This result is consistent with previous studies emphasizing that digital marketing effectiveness depends not only on platform usage but also on the integration of content quality, targeting accuracy, and cost control [7].

Viewer engagement emerged as a dominant variable influencing sales outcomes. Higher viewer numbers increase market reach and brand visibility, but they do not automatically guarantee sales conversion. This finding supports the argument that digital marketing success is determined by how well MSMEs align content with market segmentation and consumer behavior rather than merely increasing exposure [8]. Therefore, MSMEs must focus on relevance and informativeness of content to improve conversion rates.

Marketing cost also plays a dual role within the system. While increased spending can enhance viewer reach through

paid promotions and endorsements, excessive or poorly planned expenditure reduces marketing efficiency. This result aligns with research suggesting that digital marketing investments must be strategically allocated to avoid diminishing returns and financial inefficiency [9]. MSMEs with limited resources are particularly vulnerable to inefficient cost structures, making strategic budgeting essential.

The simulation further demonstrates that demand and competition moderate the relationship between digital marketing and sales. In highly competitive environments, digital marketing becomes a necessary tool for differentiation and market positioning. However, competition also limits the marginal impact of digital marketing when multiple MSMEs target similar audiences using comparable strategies. This finding supports earlier studies highlighting the importance of innovation and differentiation in digital marketing practices among MSMEs [10].

Overall, the System Dynamics approach provides a holistic understanding of how digital marketing variables interact over time. Unlike static analysis, this model captures feedback mechanisms and long-term effects, enabling MSMEs to anticipate future outcomes and adjust strategies accordingly. The results reinforce the view that digital marketing should be treated as a strategic, data-driven process rather than a short-term promotional activity [11].

### IV. CONCLUSIONS

The System Dynamics model developed for Digital Marketing among MSMEs in Garut Regency, based on references and field observations of culinary MSMEs, indicates that digital marketing performance is influenced by two main variables: viewers and cost. These variables determine the effectiveness of digital marketing implementation and enable MSME actors to analyze the extent to which their digital marketing activities are optimally executed. The primary objective of digital marketing as a promotional medium is to increase sales or sales performance. Therefore, viewers and cost serve as key considerations for MSMEs in evaluating and optimizing their digital marketing usage. Viewers and cost are defined as core activities within digital marketing that must be carefully managed. In addition, content quality and informativeness in content marketing play a crucial role in determining how promotional messages are communicated and delivered to consumers through digital media. Effective content presentation is expected to attract consumer attention and ultimately lead to product transactions. MSMEs exhibit diverse perceptions and conceptual understandings of digital marketing. These conceptual differences highlight the need for each MSME to adopt a clear and structured digital marketing concept aligned with its specific objectives. Digital marketing should function as a strategic marketing approach guided by principles that correspond to the selected market segmentation. Market segmentation plays a critical role in determining the direction and effectiveness of digital marketing activities.

The simulation results of the Digital Marketing System Dynamics model indicate that digital marketing functions as a flow that drives sales as the primary output. Under stable digital marketing implementation, the simulation estimates show that sales performance will continue to increase significantly over a ten-year forecasting period. This finding suggests that optimal utilization of digital marketing can generate sales growth that aligns with MSME targets. However, fluctuations in viewers and cost within digital marketing activities require proper control mechanisms to mitigate potential declines or inefficiencies. Since digital marketing has become a necessity for MSMEs, careful cost management and performance monitoring are essential to ensure optimal outcomes. Digital marketing budgets must be adjusted according to actual needs to ensure efficiency and effectiveness. Various digital marketing activities—such as online advertising, influencer endorsements, and other promotional strategies—should be selected and implemented based on the specific requirements and characteristics of each MSME.

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