

Developing a User-Centered Design Model for Digital Marketing Adoption in Village MSMEs

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Abstract. This study develops a user-centered design (UCD) model for digital marketing of village MSMEs using questionnaire surveys and entropy analysis. Key determinants like infrastructure, knowledge management and target market focus were identified for the Curug Sangereng MSMEs. The proposed approach provides a framework for rural enterprises to adopt online platforms and data-driven personalization to boost sales based on customer preferences. However, further testing across contexts is required to generalize applicability.

Keywords: Digital Marketing; MSME; User-Centered Design; Village

1. Introduction

In the digital era, digital marketing for MSMEs requires technological innovation. Technological innovation is essential to increase efficiency, effectiveness, productivity, and competitive advantage for MSME businesses. The implementation of technology is a challenge for MSMEs to increase sales of the products/services produced so that, as a concrete manifestation, it proves that MSMEs are the heart of the economy for a region to create employment opportunities and a source of income for the region (Krisnawati 2018). For this reason, MSMEs need to make breakthroughs to follow trends in technological innovation in the form of Digital Marketing information systems to introduce, promote and improve the products/services produced by MSMEs to be better known to the broader community to increase competitive advantage. To achieve this, guidance or provision of digital literacy is needed to increase the capacity of MSMEs Human Resources in opening insight and understanding about how digital marketing-based information systems work. Improve product quality and quality and open digital marketing opportunities. Although previous research has examined digital marketing for MSMEs, further research is still needed to develop a digital marketing model for MSMEs from a user perspective. This research focuses on discussing the development of user-centred Design (UCD) to improve the digital marketing of products/services produced by MSMEs in Curug Sangereng Village, Banten, as a research object. This research uses a literature survey method based on previous research to determine the critical factors influencing the digital marketing of MSME products/services. The results of mapping the critical factors became the basis for compiling questionnaire statements, which the researchers then tested on respondents to get feedback on the questionnaire statements. This research resulted in the development of UCD in Digital Marketing for MSMEs in Curug Sangereng Village, Banten, as a research object.

Curug Tangerang Banten Village has MSMEs which produce potato chips, which are managed by the youth of the village youth organization. Potato chips are still made traditionally and as a home product. These potato chips have various flavours such as balado, spicy and original. Apart from potato chips, MSMEs in Curug Sangereng Village, Banten, also produce spinach chips. This research is a work program to improve the ability of village communities to use information technology following the RIP and Community Service RENSTRA programs and also in the Sustainable Development Goals (SDGs) for Industry, Innovation and Infrastructure as an effort to support inclusive industrialization and help the development of innovation as a way to create a better life for society. This research develops a User-centred Design approach in digital marketing for MSMEs. Therefore, here are the Research Gaps of this research: Lack of UCD Model for Village MSMEs: There is a gap in the literature regarding the development of a

- a) User-Centered Design (UCD) approach specifically tailored to the digital marketing needs of MSMEs in rural villages, such as Curug Sangereng Village in Banten.
- b) Limited Focus on Digital Marketing for Rural MSMEs: Previous research has primarily focused on digital marketing for MSMEs in urban or more developed areas, overlooking the unique challenges and opportunities faced by rural MSMEs, particularly those producing traditional products like potato and spinach chips.
- c) Absence of Research on Digital Literacy in Rural Contexts: While digital literacy is highlighted as crucial for MSMEs to leverage digital marketing, there is a gap in understanding the specific digital literacy needs and challenges faced by rural MSMEs, especially in remote areas like Curug Sangereng Village.

Based on the research gap, here is the Research Questions (RQ):

1. **RQ 1:** What are the critical factors needed in developing marketing?: This question aims to identify the specific factors essential for developing effective marketing strategies tailored to the context of rural MSMEs in Curug Sangereng Village. Understanding these factors is crucial for devising targeted interventions to enhance marketing practices in these settings.

2. **RQ 2:** How is the User-Centered Design approach developed in MSME's Digital Marketing?: This question seeks to explore the process of developing and implementing a User-Centered Design (UCD) approach in digital marketing specifically tailored to the needs and constraints of rural MSMEs. It delves into the methods, strategies, and considerations involved in designing user-centric digital marketing solutions for MSMEs operating in villages like Curug Sangereng Village.

2. Methodology

Traditional marketing relies on advertising, television, radio, and face-to-face marketing, with limited consumer coverage. Digital Marketing requires the use of digital technology and internet innovation. Digital Marketing is a marketing strategy supported by digital media and online platforms focusing more on promoting products/services to a broader range of consumers. Digital Marketing helps interact with consumers effectively through various digital media (Bangun and Purnama 2022). Websites are the basis for Digital Marketing, so companies can market complete information about products or services and interact with visitors. Social Media is a platform (Facebook, Instagram, Twitter, LinkedIn, and others) used to interact with audiences and share relevant content. Email Marketing sends emails to provide information, promotions, or valuable content. Online Advertising is using paid advertising through platforms such as (Google Ads, Facebook Ads, and others) to target audiences that are relevant to the products/services produced. Search Engine Optimization (SEO) is an effort to increase website rankings in search engine results so that it is easier to find people looking for related information. Digital Content is a medium for creating and sharing content such as blog articles, videos, infographics, and others to provide audience information and build engagement. Analysis and Measurement for Digital Marketing is a more accurate measurement tool for effectiveness, such as website traffic analysis, social media engagement levels, sales conversions, etc. Digital Marketing provides flexibility and the ability to adapt better based on the data obtained so that companies can optimize marketing.

User-centred Design (UCD) is an approach to understanding user needs, preferences, and characteristics at each stage of the design process. The goal of UCD is to create products/services that meet user needs optimally (Dayanthi and Sedyono 2023). The UCD process is based on the understanding that actively involves users in the design process, which includes activities: Information collection using methods (questionnaires, interviews, surveys, and observations) to understand user needs and perspectives; Data Analysis and Mining to identify problems encountered and identify opportunities to improve user experience; Persona creation is based on collected data that represents user characteristics and needs. Personas are fictional depictions of users to understand users; Ideation and Prototyping to generate creative and diverse ideas; Testing and Evaluation to obtain user feedback; and Implementation for users (Aritonang, Johan, and Prasetiawan 2022). In the UCD approach, Digital Marketing has advantages, including Greater personalization in the content that can be presented to users to appeal to each individual in improving the user experience. Companies can interact directly with users for fast response, tracking and analysis regarding users interacting with content. Users can interact with various types of multimedia content (video, images, and animations). Users can explore products, compare prices, and make purchases quickly. In this way, Digital Marketing can provide a more personalized, interactive and customized user experience. By utilizing technology and data, companies can design content that is more relevant and focused on increasing user satisfaction. By implementing UCD, the products/services produced by MSMEs will become more relevant, easier to use, and able to provide a better experience to users because they are supported by designs based on an understanding of the end user so that they can significantly increase the marketing value of the product.

In the context of information system analysis, the Prototype method is a system development method that prioritizes user interaction in every process in information system development (Astuti, Kartono, and Rahmadi 2020). Prototypes are useful for ensuring that information system development meets user needs. This method is carried out by creating designs, prototypes, evaluations, reviews, and

updates that carry out development, testing and maintenance. The prototype method is also a system development approach that involves creating an initial model of the system being built. The aim of using the prototype method is to design system requirements by developing a model that is tested and evaluated by users and stakeholders. Based on an understanding of the requirements, the systems analyst team creates an initial prototype of the system that includes the core of the planned functionality. Prototype testing by users and stakeholders aims to obtain feedback regarding the suitability of the prototype to needs, and identify problems encountered. Based on feedback, the system analyst team makes changes to the prototype to correct problems by users. For this reason, further development is comprehensively based on designs and functionality that have been tested through prototypes. In information systems analysis, the prototype method has advantages including Involvement with the initial model of the system, so that the understanding of user and stakeholder needs is better, identifying problems and improvements in full system development, so that the risk of errors in system development can be avoided to achieve improvements level of user satisfaction. To achieve this, it is necessary to carry out good planning and management.

Table 1. Result Mapping from Previous Research

No	Factors	Definitions	References
1	Digital Marketing	Optimizing digital marketing requires technological support for MSMEs to market the products/services they produce.	(Bangun and Purnama 2022), (Aritonang et al. 2022), (Gellysa Urva, Pratiwi, and Oemara Syarief 2022), (Sasa et al. 2021), (Purwatiningsih and Pamungkas 2022), (Abdurrahman et al. 2020), (Raharja and Natari 2021), (Yolanda, Sinaga, and Simanjuntak 2022), (Ascharisa 2018), (Suranto et al. 2022)
2	Media online	E-Marketplace, online platform/marketplace, social media, Google Business, online ads	(Aulami and Ariany 2022)
3	Financial Management	Financial management with technology support can improve control and performance of MSMEs	(Bismala 2017)
4	Available Infrastructure	Availability of Technological Infrastructure is an important factor in improving marketing.	(Bismala 2017)
5	Track-ability	Availability of Track-ability function in the System to track integrated information for users	(Bismala 2017)
6	HR Quality	The quality of human resources determines the performance of MSME businesses.	(Astuti et al. 2020), (Bismala 2017), (Idah and Pinilih 2020), (Umiyati and Achmad 2021)
7	Focus Customer Need	Digital Marketing to meet customer needs for MSME products.	(Rosalina, Hamdan, and Harsiti 2019)
8	Training	application usage training to ensure users understand application usage.	(Umiyati and Achmad 2021), (Sumarmi et al. 2021)
9	User Satisfaction	User satisfaction is a measure of how satisfied users are with a product or service.	(Umiyati and Achmad 2021), (Sumarmi et al. 2021)

No	Factors	Definitions	References
10	Business Process Development	e business development process cycle,	(Kim and Moon 2021)
11	Knowledge Management	Implementing a knowledge management strategy can optimize the marketing of MSME products.	(Bismala 2017), (Pratiwi and Hansugian 2019)
12	Information Available	The availability of information influences decision making for company management	(Bismala 2017)
13	System Design	WEB-Based Home Industry UMKM Product Purchase Attraction Information System	(Mustabirin, Kartiko, and Prasetyo 2021), (Kristanda, Hansun, and Albert 2018)
14	Usability	A measure of how satisfied users are with the product or service they use.	(Dayanthi and Sedyono 2023), (Budianto and Kusniawati 2016), (Hasiholan and Amboningtyas 2021)
15	Accessibility	Accessibility for users in using the application is well used by users who have access	(Dayanthi and Sedyono 2023), (Budianto and Kusniawati 2016), (Hasiholan and Amboningtyas 2021)
16	Analytical	Analytical to carry out analysis in making further decisions for users.	(Kristanda et al. 2018)
17	Collaborative	Collaborative in the system to collaborate on control result information for users	(Kristanda et al. 2018)
18	Innovative Technology	innovative technology to follow technological trends in applications	(Kristanda et al. 2018), (Oktadini et al. 2022)

The knowledge management factor is one of the critical factors for improving the culture of sharing knowledge and communicating effectively to enhance the quality of human resources in an organization (Pratiwi and Hansugian 2019). The application of new technology can measure the level of readiness to accept new technology to improve company performance (Oktadini et al. 2022).

This research uses a literature survey method from previous research to map critical indicators in developing a digital marketing model for MSMEs. Researchers used the search engine Google Scholar with the keywords "MSMEs and Digital Marketing", considering the publication years of proceedings and journals for the last five years. The results of the indicator mapping become the basis for making questionnaire statements. This research also processes data based on the results of distributing questionnaires via Google Forms. The results of the analysis of data processing are the basis for designing a Digital Marketing model for MSMEs.

Table 2. Dependent Factors Affecting MSMEs

No	Dependent factors	Statements
1	Digital Marketing	11
2	HR Quality	4
3	System Design	1
4	Measure	1
5	Financial Management	1
6	Available of machine tools	1

7	Focus Customer need	1
8	Media Online	1
9	Knowledge Management	1
10	Available of Materials	1
11	Information Available	1
12	HR Competency	1
13	Usability	1
14	Accessibility	1
15	Precision	1
16	Recall	1
17	Business Process Development	1
18	User Satisfaction	1

This research uses a questionnaire method to map from previous research to create a synthesis and find critical factors that influence the development of digital marketing modelling for MSMEs. Based on these vital factors, this research then formulates essential components that can answer this research problem. The results of the formulation from previous research are the basis for designing digital marketing modelling for MSMEs, which is reviewed from a perspective related to the problems in this research.

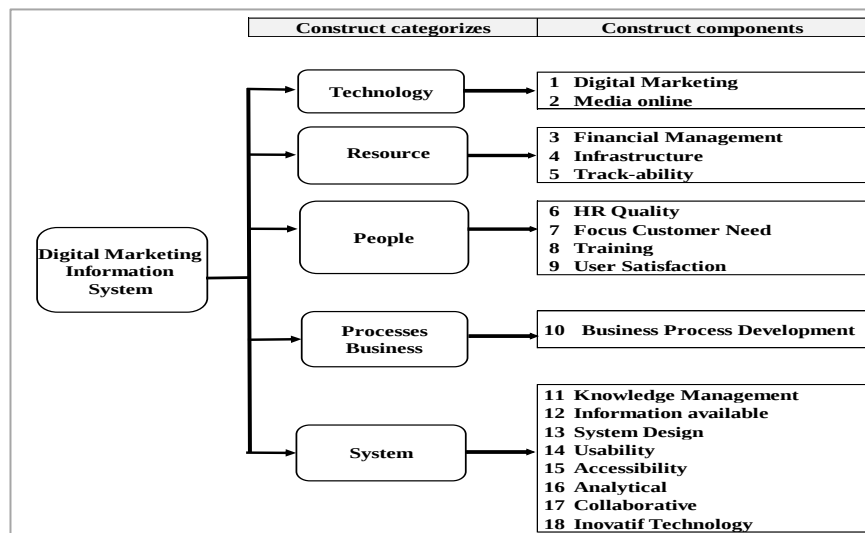


Fig.1: Research model

In determining the ranking of each indicator, which is the basis for the probability distribution of respondents' answers to questionnaire questions, this research uses the entropy method. The entropy method is one of the MCDM methods used to determine indicator rankings (Asl et al. 2012).

The author assesses the weight of each indicator using the following formula: Each number is reduced to its ideal value. X_{ij} states the result of this reduction:

- Each number was subtracted with the ideal value. X_{ij} expresses the result of this subtraction.
- X_{ij} value was obtained from the P_{ij} matrix as:

$$P_{ij} = \frac{x_{ij}}{\sum_{i=1}^m x_{ij}}, \forall i, j \quad (1)$$

where m denotes the number of respondents.

- Entropy values for each criterion were calculated using:

$$E_j = -k \sum_{i=1}^m P_{ij} \ln P_{ij}, \forall j, \quad (2)$$

$$\text{Where } K = \frac{1}{\ln m} \quad (3)$$

- d) The dispersion of each criterion was calculated using:

$$dj = 1 - Ej, \forall j \quad (4)$$

- e) Assume that the total weight = 1, so to get the weight of each criterion, the dispersion value was normalized using (4), where n is the number of criteria.

$$Wj = \frac{dj}{\sum_{j=1}^n dj} \quad (5)$$

3. Result and Discussion

Based on the results of the questionnaire, this research was carried out processing using the Entropy method. The ranking of indicators resulting from data processing can be shown. The results of data processing shows that Digital Marketing is the most significant factor, with a score of 0.981, the infrastructure factor has a score of 0.872, and the Knowledge Management factor has a score of 0.833. The results of this data processing show that the Digital Marketing indicator is a significant indicator in efforts to promote products/services to increase marketing for MSMEs, which is carried out digitally. Marketing products/services digitally for MSMEs has become a necessity.

For this reason, there is an absolute need for support from technological facilities and assistance for resources to understand how to use this information system application so that optimal use of the information system application can significantly increase the marketing of products/services and the transparency of business and financial processes becomes more controlled. This is an answer to the formulation of the first problem in this research, namely, the digital marketing factor is a critical factor needed in developing marketing. Likewise, the results of data processing show that the Knowledge Management factor is a significant factor that can influence the development of a UCD approach in digital marketing for MSMEs, namely by identifying the target market for MSMEs through data analysis and customer charm so that they can know the characteristics and needs of customers precisely and specifically. For this reason, it is necessary to build an information system application with more focus on designing a relevant and exciting user experience. Besides that, it requires a commitment to adapt to change and improve the user experience. This is an answer to the formulation of the second problem in this research, namely efforts to develop a User-centred Design approach in Digital Marketing for MSMEs Table 3.

Table 3. Indicator Ranking

No	Factors	Entropy Indexes
1	Digital Marketing	0.981
2	Infrastructure	0.872
3	Knowledge management	0.833
4	Business Process Development	0.817
5	Training	0.810
6	System Design	0.805
7	Accessibility	0.803
8	Information available	0.801
9	Innovative Technology	0.797

No	Factors	Entropy Indexes
10	HR Quality	0.794
11	Usability	0.787
12	Analytical	0.781
13	User satisfaction	0.738
14	Financial Management	0.737
15	Media online	0.715
16	Focus Customer Need	0.715
17	Collaborative	0.707
18	Track-ability	0.654

3.1.1. Limitations:

- a) **Subjectivity of Entropy Method:** While the Entropy method can provide rankings based on data, it may still be subject to biases or subjective interpretations in selecting and weighting indicators.
- b) **Limited Scope of Questionnaire:** The results are dependent on the questionnaire used, which might not encompass all relevant factors or perspectives, potentially leading to overlooking crucial aspects.
- c) **Generalization of Results:** The findings might not be universally applicable as they are based on specific survey responses and may not represent the broader population of MSMEs.
- d) **Single Method Approach:** Relying solely on the Entropy method for data processing may overlook other valuable analytical techniques or perspectives, limiting the depth of insight gained from the research.

3.1.2. Enhancements:

- a) **Validation and Triangulation:** Supplementing the Entropy method with other analytical approaches or data sources could enhance the robustness and reliability of the findings, providing a more comprehensive understanding of the factors influencing digital marketing for MSMEs.
- b) **In-depth Qualitative Analysis:** Incorporating qualitative research methods such as interviews or focus groups could offer deeper insights into the experiences, challenges, and needs of MSMEs in digital marketing, complementing the quantitative findings from the questionnaire.
- c) **Longitudinal Study:** Conducting a longitudinal study to track changes over time could provide valuable insights into the evolving dynamics of digital marketing for MSMEs, allowing for more informed decision-making and strategy development.
- d) **Cross-sectional Analysis:** Analyzing data across different industries or regions could reveal variations in digital marketing practices and needs among MSMEs, enabling targeted interventions and support tailored to specific contexts.

4. Conclusions

The UCD model offers a baseline framework for village MSMEs digital marketing tailored to local infrastructure constraints and rural consumer behavior. Nonetheless, validating suitability through user studies across multiple locations remains necessary. Overall, the analysis provides data-backed approach for context-specific applications to enable small rural producers transform digitally for growth and competitiveness.

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