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AI Chatbot as a Prompt Generator: A Solution for Enhancing Digital Marketing Campaign Productivity

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Abstract

This research implements utilization of the artificial intelligence (AI) based chatbots for automatically generating prompt for digital marketing ideas to boost productivity. The interesting results of the study revealed through qualitative methods are that, besides tremendously speeding up the content creation process, chatbots attract a much larger audience. As AI understands the natural language and is processed, the chatbots can help with generating relevant and content ideas in compliance with user needs. This is an alarming discovery that emphasizes how required AI is as a part of modern marketing strategies as personalization and efficiency are essential for a successful marketing campaign and part of marketing technology stack. The paper further discusses potential challenges like data privacy and algorithmic bias that should be considered while using AI. So, the created chatbot system will be a sustainable solution.

***Keywords**: AI Chatbot; Generator prompts; Digital marketing; Productivity; Engagement.*

Abstrak

Penelitian ini mengimplementasikan pemanfaatan chatbot berbasis kecerdasan buatan (AI) untuk secara otomatis menghasilkan prompt ide pemasaran digital guna meningkatkan produktivitas. Hasil menarik dari studi yang diperoleh melalui metode kualitatif menunjukkan bahwa, selain secara signifikan mempercepat proses pembuatan konten, chatbot juga mampu menarik audiens yang jauh lebih luas. Karena AI mampu memahami dan memproses bahasa alami, chatbot dapat membantu menghasilkan ide konten yang relevan dan sesuai dengan kebutuhan pengguna. Temuan ini menjadi penanda penting yang menekankan betapa dibutuhkannya AI sebagai bagian dari strategi pemasaran modern, di mana personalisasi dan efisiensi menjadi kunci keberhasilan dalam kampanye

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pemasaran serta sebagai bagian dari tumpukan teknologi pemasaran (marketing technology stack). Makalah ini juga membahas berbagai tantangan potensial seperti privasi data dan bias algoritmik yang perlu diperhatikan dalam penggunaan AI, sehingga sistem chatbot yang dikembangkan dapat menjadi solusi yang berkelanjutan.

***Kata kunci**:* AI Chatbot; Generator prompts; Digital marketing; Productivity; Engagement.

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INTRODUCTION

The rapid advancement of information technology has significantly impacted various aspects of human life, especially in the business sector. One of the most prominent innovations is Artificial Intelligence (AI), which is now widely adopted across industries, including digital marketing (Balcombe, 2023). One key application of AI is the use of chatbots in social media marketing, enabling companies to accelerate services and enhance customer engagement (Adamopoulou et al., 2020). Companies that fail to adapt to this technological shift risk falling behind, missing opportunities to reach broader market segments and retain existing customers (Fetasi et al., 2022; Poulis et al., 2019). In social media marketing practices, a common challenge is the user's inability to deliver clear instructions or prompts to chatbots. This often causes the chatbot to misinterpret the request, resulting in inaccurate or irrelevant responses (Lou et al., 2022). Vague prompts can significantly reduce the chatbot's effectiveness (Dermawan, 2024), negatively impacting marketing strategies (Belongie, 2022). Many users still perceive chatbots as simple tools, without realizing that well-crafted prompts can transform them into highly intelligent and responsive systems (Sikha et al., 2023).

The lack of understanding of prompt engineering limits the optimal use of chatbot technology, even though its potential spans areas such as content personalization and market research (Israfilzade, 2021; Auernhamer, 2020). Without sufficient knowledge, users fail to utilize the advanced capabilities of AI, leading to subpar performance (Anton et al., 2024). As prompt engineering continues to evolve, digital marketers need to develop sufficient technical literacy to stay competitive in the ever-changing digital marketing landscape (Bilgram et al., 2023). AI plays a vital role in shaping the modern digital marketing landscape. Its ability to analyze big data quickly enables smarter and faster decision-making (Kumar et al., 2021). However, many existing chatbots are static systems that respond based solely on prewritten scripts (Adamopoulou, 2020). Businesses still

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rely heavily on manual, rule-based systems that struggle with scalability and lack real-time adaptability (Yaacub et al., 2021; Seeam, 2014; Safitri et al., 2023).

The rise of Machine Learning (ML) and Natural Language Processing (NLP) technologies has made AI systems more adaptive and capable. Still, traditional AI systems often cannot provide personalized, relevant recommendations without human intervention (Allil, 2024; Michael et al., 2024). This research develops a generative AI chatbot prototype that can automatically generate prompts based on a relevant knowledge base. It is designed to learn and improve over time (Chudleigh, 2024), helping users create more effective and personalized social media marketing content.

Productivity is defined as the ratio between output and input (Sinungan, 2005). The chatbot developed in this study aims to improve productivity by generating accurate, relevant content using NLP and ML. With proven capabilities such as increasing ROI by 35% (Donthireddy et al., 2024) and reducing campaign planning time from 64 hours to 50 hours per cycle (Tastemirovich, 2024), AI chatbots offer a competitive edge. They are also accessible to non-technical users (Choung et al., 2023) and help businesses save time, money, and human resources (Broek, 2024; Larimo & Leonidu, 2023; Homola, 2023).

This research applies a prototyping approach to build the chatbot system, and a quantitative descriptive method to assess its impact on productivity in social media marketing. The process includes problem identification, initial data collection through interviews, observations, literature reviews, and functionality testing. The novelty of this study lies in its focus on an Indonesian-language AI chatbot specifically designed for generating social media content prompts. The research addresses the gap in user knowledge regarding prompt engineering and aims to contribute both theoretically and practically to the development of innovative AI marketing tools.

METHODS

Research Design

This study employs a descriptive quantitative method. According to Sugiyono (2016:7), descriptive research that uses surveys begins with a paradigm (concept) and data, with the goal of either accepting or rejecting the applied theory. Descriptive research heavily relies on measurement results derived from the data. Therefore, statistics play a crucial role as a tool for analyzing problem-solving solutions in this study.

Data Collection Methods

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The initial phase of data collection involved an extensive review of academic literature, industry publications, and case studies related to the use of AI in marketing. This comprehensive review established the theoretical foundation, enabling the identification of key concepts, emerging trends, and existing knowledge gaps. The researcher collected data through literature review, observation, and interviews. Three key informants were interviewed: a social media specialist, a content creator, and a freelance wedding organizer, all of whom work in the field of content marketing. The interviews and observations served as primary data sources for identifying the requirements in developing the chatbot. In addition, the researcher distributed questionnaires to assess perspectives on whether the AI chatbot has an impact on productivity in social media marketing.

Data Analysis Techniques

According to Sugiyono (2011), an instrument is valid if it measures what it is intended to, and reliable if it provides consistent results. Siregar (2011) noted that questionnaire data is interval-scaled and continuous. Pearson's Product Moment Correlation is used to test validity, while Cronbach's Alpha test's reliability. A reliability coefficient (r11) > 0.6 indicates the instrument is reliable. SPSS was used for both validity and reliability tests.

Data analysis was conducted after empirical data collection. The data was processed using descriptive statistics (Sugiyono, 2016; Sudjana, 1996). Scores were assigned as follows: Positive Statements: Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1. Negative Statements: Scoring is reversed. Data was analyzed using SPSS v25.0, with results presented through tables, percentages, mean, median, and standard deviation. Based on Sudijono (2009), scores were categorized into five intervals ranging from "Very Negative" to "Very Positive" based on mean (M) and standard deviation (SD).

The research was conducted in Surabaya, chosen for its strategic relevance to the study topic. Population: Social media users engaged in digital marketing activities (e.g., digital marketers, business owners, content creators, freelancers, and digital agencies). The population size is unknown and considered non-probability. Sampling Technique: The study used purposive and snowball sampling. Criteria for participants included

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individuals involved in content creation or social media marketing. In total, 54 respondents were surveyed.

RESULT AND DISCUSSION

Artificial Intelligence

Artificial Intelligence (AI) is a branch of computer science that develops systems capable of performing tasks typically requiring human intelligence. AI enables machines to process data, make decisions, and solve problems through reasoning and pattern recognition (Russell & Norvig, 2021). In digital marketing, AI serves as the foundation for chatbot functionality, particularly in generating personalized content prompts that enhance audience engagement.

AI chatbots provide brands with personalized content prompts that foster new forms of engagement in digital marketing. AI-powered chatbots utilize two primary technologies: Natural Language Processing (NLP) for understanding user input and Machine Learning (ML) for continuous improvement through pattern recognition and effectiveness measurement. This combination allows chatbots to deliver increasingly accurate and relevant responses over time (Goodfellow et al., 2016; Husin et al., 2022).

Natural Language Processing (NLP)

Natural Language Processing enables computers to interpret and generate human language through various computational techniques. Core NLP processes include tokenization (breaking text into manageable units), syntactic parsing (understanding grammar structures), and sentiment analysis (detecting emotional tone). These capabilities allow chatbots to comprehend user intent and respond appropriately (Jurafsky & Martin, 2020).

In marketing applications, NLP allows chatbots to adapt their communication style based on detected user emotions and preferences. By analyzing interaction history, these systems learn language patterns and provide increasingly relevant content recommendations, creating more natural and engaging user experiences that effectively bridge artificial intelligence with authentic human interaction.

Machine Learning (ML)

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Machine Learning (ML) is a branch of Artificial Intelligence (AI) that enables computers to learn from data and make predictions or decisions without being explicitly programmed. In ML, systems are trained on historical datasets to recognize patterns and make informed decisions based on new incoming data (Goodfellow et al., 2016). In this project, ML is utilized to enhance the chatbot's ability to generate relevant and effective prompts.

There are three main types of ML: supervised learning, unsupervised learning, and reinforcement learning. This chatbot applies supervised learning by training the model with labeled prompt-response data. Through this method, the chatbot learns the most effective prompt structures to use in specific social media contexts. ML also plays a key role in analyzing historical interaction data to understand user preferences. Past user interactions such as the most frequently used prompts or those that drive high engagement are leveraged to adapt and refine the chatbot's responses. This personalization increases the relevance and usefulness of the prompts generated.

Next, unsupervised learning enables the chatbot to discover new patterns from user interactions without direct supervision. For instance, the system may identify emerging content categories or social media trends based on frequently submitted inputs. This helps the chatbot not only stay current but also suggest content ideas aligned with those trends. Finally, reinforcement learning allows the chatbot to improve over time through experience. The system learns from user feedback in real time, adjusting its prompt generation to better suit user preferences. For example, if a user consistently favors a particular type of prompt, the chatbot will begin to prioritize offering similar prompts in future interactions (Sutton & Barto, 2018).

Natural Languange Processing in Chatbot

Natural Language Processing (NLP) is a subfield of Artificial Intelligence that enables computers to understand and generate human language. In chatbot applications, NLP serves as the foundational technology for processing user input, interpreting intent, and generating contextually appropriate responses (Jurafsky & Martin, 2020). According to Ding, Dong, & Grewal (2024), Generative AI provides comprehensive solutions for content creation and data processing, with significant

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applications in social media marketing that enhance organizational productivity.

The implementation of NLP in chatbots allows systems to transform ambiguous or complex user input into meaningful, contextual responses. This capability is particularly valuable in marketing contexts, where chatbots must generate prompts that users perceive as valuable and relevant (Husin et al., 2021). NLP technology empowers marketers with intelligent prompt recommendations that align with current trends and target audience preferences, making it essential for developing responsive chatbots that enhance social media marketing productivity (Goodfellow et al., 2016).

Tokenization

Tokenization represents the fundamental NLP process of breaking down text into smaller, manageable units such as words or phrases. This process enables computers to better understand language structure and segment meaning, allowing chatbots to identify relevant keywords for generating appropriate responses (Manning et al., 2008).

Two primary tokenization approaches exist: word-level tokenization, which splits text into individual words, and sentence-level tokenization, which divides paragraphs into sentences. Word-level tokenization proves particularly valuable in chatbot applications, enabling systems to detect key marketing terms like "promo" or "discount" for contextually relevant responses.

However, tokenization faces significant challenges with contractions and compound expressions. Languages without clear word separators, such as Mandarin or Japanese, require advanced techniques including character-based models or machine learning-based segmentation (Goodfellow et al., 2016). Modern NLP libraries like NLTK and SpaCy provide automated tokenization tools that can be customized to recognize context-specific terminology, ensuring chatbots generate appropriate prompts and maintain content relevancy.

Sentiment Analysis

Sentiment analysis involves identifying emotions or opinions expressed in user text, enabling chatbots to tailor responses according to user emotional states. This technology employs machine learning

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algorithms or emotion dictionaries to classify text into positive, negative, or neutral categories (Manning et al., 2008).

In marketing applications, sentiment analysis helps chatbots detect input tone and deliver appropriate responses. When users express dissatisfaction, chatbots can respond with supportive messages or relevant promotional offers, while enthusiastic users may receive cheerful promotional suggestions (Jurafsky & Martin, 2020). This capability allows marketers to understand audience reactions to specific content and refine social media strategies accordingly.

Text Generation

Text generation refers to the automated creation of text or Text generation enables automated creation of content suggestions based on user input. This technology allows chatbots to produce creative, contextually relevant prompts that help marketers streamline brainstorming processes (Goodfellow et al., 2016).

Deep learning models such as GPT and BERT, trained on extensive datasets, power text generation capabilities. These models enable chatbots to understand user context and produce comprehensive responses tailored to specific needs (Radford et al., 2019). Text generation systems can be customized to match brand voices and tones, whether formal or casual, significantly enhancing marketing team efficiency by providing auto-generated prompt options that allow focus on strategy and implementation rather than initial content ideation.

Social Media Marketing

Social media marketing has become the most effective tool in terms of user-generated content and word-of-mouth promotion. In turn, businesses can give their messages the opportunity to grow through their users. The speed of these platforms, along with the ease of customer response, promotes organizational flexibility while highlighting customers or inquiring about customer outcomes (Labrecque et al., 2013). Furthermore, social media analytics allow marketers to gather real-time insights from customers, which are crucial in strategy development and delivering targeted campaigns (Moe & Schweidel, 2017).

Various types of social media represent a new horizon in communication between companies and users, such as Instagram, TikTok,

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and Facebook. Brands can diversify their advertising campaigns across a wide spectrum of audiences. These platforms not only serve as promotional communication channels but also as spaces for customer support, offering opportunities for relationship development (Hajli et al., 2017). Along with the speed of communication, social media marketing has taken on an important role in crisis management, allowing companies to monitor brand image, thus reducing risk and managing public interaction (Borah et al., 2020).

AI has a significant impact on marketing processes, and its influence will only grow in the future. Many manual and repetitive tasks in marketing can already be replaced by AI. The use of machines working alongside humans is key to achieving better marketing results. The main challenges in AI adoption are human trust in the technology and readiness for cultural change. Chatbots that generate relevant content and adapt based on social media trends will align with best practices in modern Social Media Marketing (Ribeiro & José Luís Reis, 2020).

Table 1. Marketing Evolution

Era	Period	Focus
Technology-Augmented Marketing Era	2000+	Technology augments all aspects of strategic and tactical marketing efforts.
Value-Based Marketing Era	1980-2000	Focus on relationship marketing and customer-centric strategies.
Marketing Era	1950-1980	Focus on tactical marketing: product, place, price and promotion (4Ps).
Sales Era	1920-1950	Focus on competition for customers, prospecting, and lead generation.
Production Era	1900-1920	Focus on product manufacturing efficiency.
Simple Trade Era	Pre-1900	Focus on basic exchange.

Source: Grewal and Levy (2024)

Consistency

Consistency in Social Media Marketing (SMM) is about maintaining regular content quality and posting schedules to build expectations among the audience. Consistent brands are easier to remember and trust, as audiences feel comfortable with repetitive and stable experiences (De Vries et al., 2017). A consistent strategy involves regular posts tailored to each platform's format, such as visual content on Instagram or short messages on X (formerly Twitter). Consistency also includes message alignment across multiple media to reinforce brand identity. With a cohesive approach, companies can enhance cross-platform campaign effectiveness and create

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a unified experience for consumers (Dwivedi et al., 2019). Consistent brands are more likely to gain loyalty and positive engagement, especially as consumers develop expectations and attachments to content patterns.

However, consistency does not mean monotony. It is important to innovate in content presentation without changing the brand's core values and message. Companies must adapt to trends while staying true to their communication style and brand guidelines. Automation tools such as chatbots can help maintain posting frequency and provide consistent responses to users, especially at scale (Carlson et al., 2018).

Table 2. Marketing Elements Added to Marketing Edition

Edition	Year	Key Changes & Features
Marketing 1e	2008	First marketing principles textbook to integrate new AMA definition of value emphasizing value creation, capture (added), communication, delivery, analysis, and assessment
Marketing 2e	2010	Consideration of conscious CSR, greater emphasis on marketing metrics, introduction of "value-based marketing" orientation in first chapter
Marketing 3e	2012	Emphasis on the power of the internet (illustrations and examples)
Marketing 4e	2014	New chapter on social and mobile marketing with 4E framework and social media strategy framework (listen, analyze, and do)
Marketing 5e	2016	Further emphasis on social and mobile marketing throughout the book
Marketing 6e	2018	Additional emphasis on marketing analytics
Marketing 7e	2020	Increased discussion of sustainability and advanced consumer behavior topics (choice architecture, nudges, opt-ins/opt-outs), introduction of AI role, new technology framework in service chapter
Marketing 8e	2022	Greater emphasis on digital marketing (online, social, mobile), introduced 4R framework for influencer marketing (relevance, reach, response, ROI), added 5Vs of big data (volume, value, variety, velocity, veracity)
Marketing 2024	2024	Chapter 1 introduces technology-augmented era, Chapter 3 explores AI in digital marketing, Chapter 20 covers digital sales process (generating leads, acquiring customers, closing), added UN SDGs discussion
M version 2025	2025	Major emphasis on generative AI

Source: (Grewal et al 2024)

Relevance

Relevance is crucial for making campaigns more engaging and meaningful to the audience. Relevant content is based on interests, preferences, or the latest trends, allowing brands to stay emotionally and

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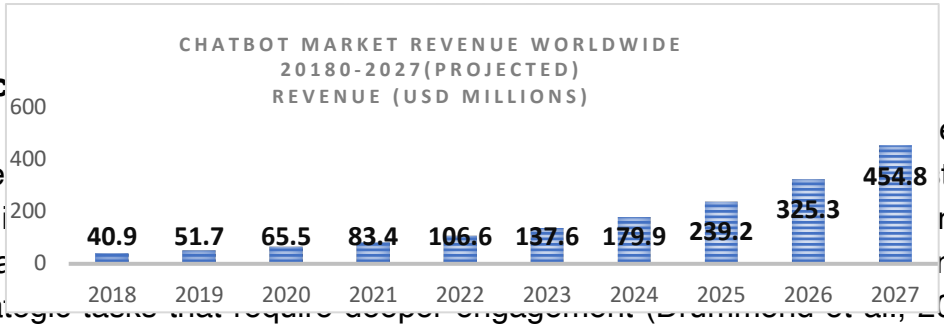
informatively connected with their audience (Holliman & Rowley, 2014). A relevant strategy considers customer data and social media analytics to identify the most suitable topics or formats. The use of data also enables trend prediction, helping companies anticipate customer needs. In this context, AI-powered chatbots can generate appropriate content or suggestions based on direct user input, making communication more personal and relevant (Timoshenko & Hauser, 2019). This makes brands appear more responsive and aligned with consumer needs. Furthermore, AI has a significant influence on personalized content marketing. Its capabilities enable highly tailored marketing strategies, and the integration of AI channels significantly enhances content personalization (Alqurashi et al., 2023).



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As a result, companies can remain productive without sacrificing campaign consistency and quality. Chatbot automation also speeds up response times to customer inquiries or complaints. This enhances service quality and customer experience, especially on platforms that demand rapid interaction such as Instagram and Twitter (Timoshenko & Hauser, 2019). By shortening response time, companies can maintain customer engagement and reduce the risk of losing customers due to delays.

Productivity in Social Media Marketing

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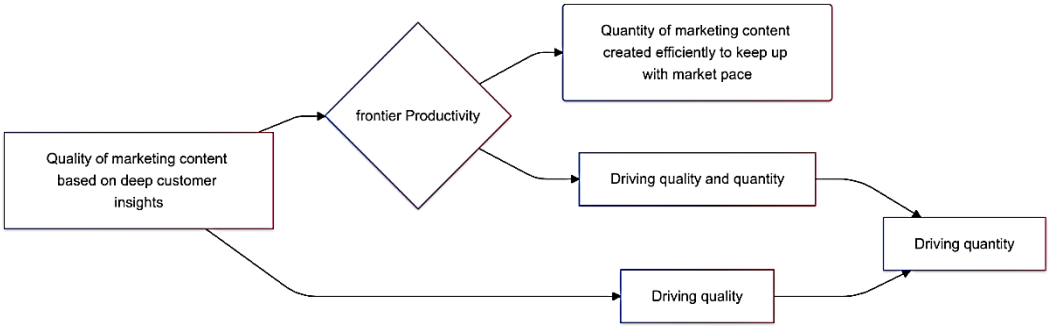
Gao, Arava et al. (2023) highlight the use of ChatGPT in enhancing productivity in social media marketing. Heitmann (2024) emphasizes that using Generative AI (GenAI) to boost productivity in promotional content enables the efficient creation of high-quality content both text and visuals allowing marketers to produce more content without compromising quality. GenAI supports ideation, message adaptation to specific audiences, and the creation of diverse product concepts (Holliman & Rowley, 2014).

Chatbots capable of analyzing content performance in real-time provide marketing teams with essential insights to improve future strategies. With accurate engagement data, chatbots help identify the most effective posts and enhance ROI (Timoshenko & Hauser, 2019). Furthermore, AI has



is often time-consuming, especially during brainstorming and material curation. The chatbot in this project aims to shorten the process by providing relevant and automated content suggestions based on trends and user input. This automation enables social media teams to move more quickly from idea to execution. With a chatbot capable of generating prompts, companies can ensure a consistent posting schedule without compromising the creativity of their teams (Tashtemirovich, 2024)

Figure 2. Shifting the productivity frontier of marketing
Source: (Heitmann,2024)

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Content Volume

The volume of content produced significantly affects audience reach and engagement. The more content published regularly, the higher the chances of capturing audience attention. Chatbots help increase content volume by offering templates or content concepts, accelerating both the creation and publication processes (Hewett et al., 2016). However, increasing volume must be accompanied by relevance and quality. Through AI-based analysis, chatbots can offer specific content recommendations aligned with current trends, making each post more likely to attract audience interest and boost engagement. Timely and relevant content distribution results in higher interaction. With a chatbot system, companies can automatically adjust the number of posts to align with audience behavior patterns.

Engagement Rate

Engagement rate is a key metric in Social Media Marketing (SMM) that measures how actively audiences interact with content. Interactions such as likes, comments, and shares reflect audience interest and engagement. Chatbots can enhance engagement by providing quick responses and suggesting content that aligns with user interests (Carlson et al., 2018). Automation also enables companies to respond to questions or comments in real time, improving the overall customer experience.Bots connected to analytics tools can monitor which content receives the highest engagement and recommend future improvement strategies. Chatbots can help companies achieve their campaign objectives more quickly and effectively.

Table 3 Comprehensive Metrics for ROI, Time, and Effectiveness
Source: (Tashtemirovich,2024)

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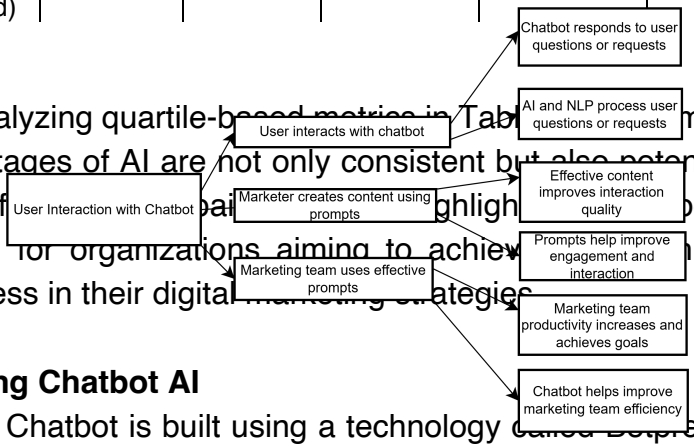
Metrics	Q1 (Lowest Quartile)	Q2 (Lower-Mid Quartile)	Q3 (Upper-Mid Quartile)	Q4 (Highest Quartile)	Overall Average
ROI (Traditional)	0.98	1.12	1.2	1.35	1.16
ROI (AI-Enabled)	1.22	1.4	1.5	1.66	1.48
Time (Traditional, hours)	90	86	82	78	84
Time (AI, hours)	64	60	56	50	56
Effectiveness (Traditional)	0.42	0.48	0.52	0.58	0.49
Effectiveness (AI-Enabled)	0.54	0.59	0.63	0.7	0.62

By analyzing quartile-based metrics in Table [illegible] mes evident that the advantages of AI are not only consistent but also potentially greater in higher-perf[illegible]ghligh[illegible]portance of AI integration for organizations aiming to achiev[illegible] efficiency and effectiveness in their digital marketing strategies.



Protoyping Chatbot AI

The AI Chatbot is built using a technology called Botpress. Botpress is a comprehensive platform for building AI agents. These conversational agents are constructed with a *node* structure. Nodes are the main units of the chatbot agent's conversational logic. Nodes typically execute one or a series of actions and transition to other nodes or flows. Nodes serve as steps in the conversation. A single node can contain multiple types of content, instructions, and transitions. The following diagram illustrates the relationship between AI and NLP technology, the use of prompts in marketing, and their impact on productivity:

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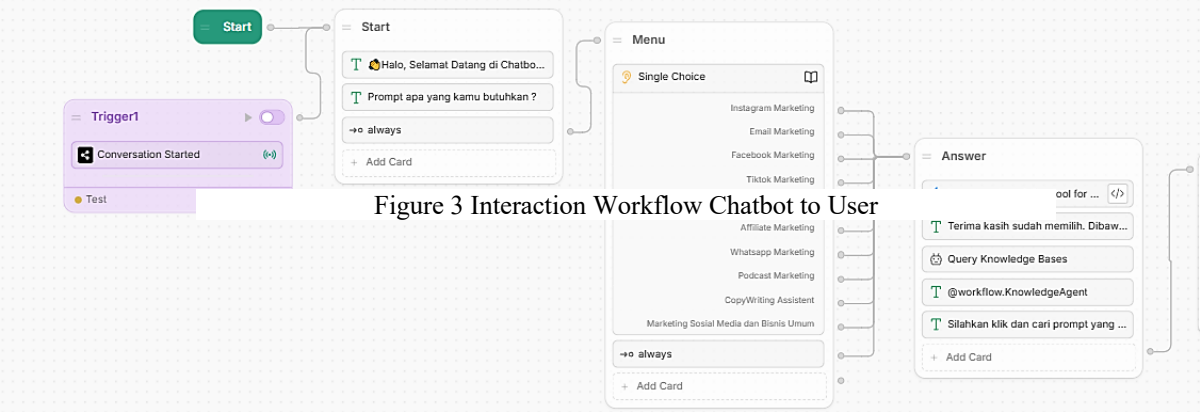
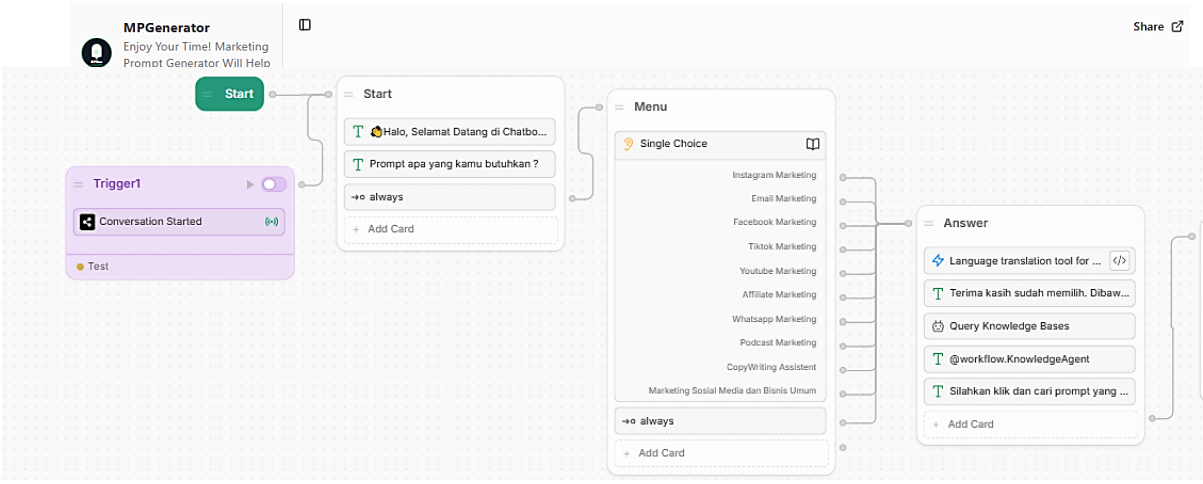


Figure 3 Interaction Workflow Chatbot to User

Figure 4. Display and Answer Chatbot

Chatbot UI/UX display and response:



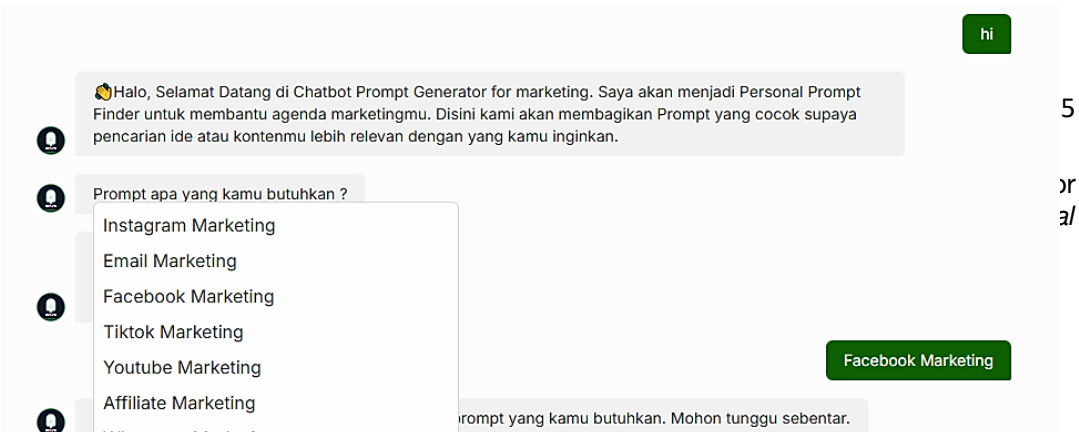


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Table 3. Blackbox Testing Prototype Chatbot

Data Analysis

No	Test Name	Test Steps	Expected Result	Status
1	Welcome Message	1. Open the chatbot 2. Wait for the initial response	Welcome message appears	Valid
2	Main Menu	1. Open the chatbot 2. View available menu options	All 11 menu options appear	Valid
3	Social Media Selection	1. Open the chatbot 2. Select an option	Response corresponds to selected option and provides further guidance	Valid
4	Query Knowledge Base	1. Enter the conversation 2. Use the 'Query Knowledge Bases' feature	Relevant and informative search results from the knowledge base	Valid
5	Language Translation Feature	1. Send a message in a language other than Indonesian 2. Observe if the translation tool activates	Message is accurately translated into Indonesian	Valid
6	Generative Response AI	1. Send a question requiring AI response 2. Wait for response from 'Generative_AI' module	AI response is relevant, contextual, and helpful	Valid
7	Multiple Choice Selection	1. Access the 'Advance_conversation' section 2. Select one option from the multiple choice.	Selected option is correct, and conversation continues accordingly	Valid
8	Web Search Integration	1. Enter the 'Autonomous' module 2. Activate 'Web Search' 3. Send a question requiring web search	Web search results are accurate and up-to-date	Valid
9	Generate Content	1. Enter the 'Autonomous' module 2. Activate 'Generate Content' 3. Ask chatbot to create specific content	Content is high-quality, relevant, and as requested	Valid
10	End Conversation	1. Complete the conversation flow 2. Observe the closing message	Closing message appears and conversation ends correctly	Valid

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Validity Testing

In this testing, the number of respondents: 54, the number of statement items was 15, and the measurement was using a 4-point Likert scale (1 = Strongly Disagree, 4 = Strongly Agree). The validity test was conducted using the corrected item-total correlation method. An item is considered valid if the calculated correlation coefficient (r-value) is greater than the critical value from the r-table. With 54 respondents and a 5% significance level, the r-table value is 0.268.

Table 4 Corrected Item Total

Indicator	Item 1	Item 2	Item 3	Item 4	Item 5	Status
Time Efficiency	0.84	0.84	0.83	0.82	0.73	Valid
Content Quality and Relevance	0.77	0.72	0.76	0.70	0.73	Valid
User Satisaction and Usability	0.75	0.68	0.81	0.78	0.78	Valid

According to Arikunto, as cited in Duwi Priyatno (2009:17), an instrument is considered valid if the calculated r-value (r-count) is greater than the r-table value. Based on the results of the validity test presented in the indicator table above, it can be seen that all items in the research variables have r-count values greater than the r-table at a 5% significance level (α = 0.05). Therefore, it can be concluded that all question items are valid and can be used as research instruments.

Reliability Testing

Table 5. Reliability Testing

Indicators	Cronbach's Alpha	Items	Interpretation
Time Efficiency	0.9142	5	Reliable
Content Quality and Relevance	0,8516	5	Reliable
User Satisaction and Usability	0,9069	5	Reliable

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This is considered reliable because all indicators show a Cronbach's Alpha (α) value greater than 0.5. This demonstrates that all the question items used can produce consistent data.

Descriptive Analysis

Table 6. Descriptive Analysis (Mean and Stanard Deviation) Per Indicator

Indicators	Mean	Standard Deviation
Time Efficiency	3.39	0.42
Content Quality and Relevance	3.22	0.48
User Satisaction and Usability	3.16	0.51

Interpretation and Discussion of Results

Respondent Characteristics

- Many respondents were female (81.5%).
- Most respondents were aged 21–22 years (66.7%).
- The most common profession was content creator (24.1%).
- A total of 85.2% had used an AI chatbot, with 61.1% having tried it and 24.1% using it frequently.

Time Efficiency

- Average score: 3.39 (moderate-positive category).
- 50% of respondents rated time efficiency as positive to very positive.
- Highest score: "AI chatbot helps save time in content creation" (3.46).
- Lowest score: "AI chatbot helps reduce content revision time" (3.19).

Content Quality and Relevance

- Average score: 3.22 (moderate category).
- 40.8% of respondents rated quality and relevance positively.
- Highest score: "Helps reduce creative block" (3.28).
- Lowest score: "Content is of better quality" (3.15).

User Satisfaction and Ease of Use

- Average score: 3.16 (moderate category).
- 37% rated satisfaction and ease of use positively.
- Highest score: "AI chatbot is easy to use" (3.22).
- Lowest score: "Would recommend AI chatbot to others" (3.11).

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All indicators fell within the moderate to positive range. Time Efficiency scored the highest (3.39), suggesting users appreciate the chatbot's support in speeding up their workflow. However, improvements are still needed in content quality and user satisfaction. Validity and reliability tests confirmed the instrument is both valid and reliable. Notably, the term "moderate" does not indicate neutrality but rather a balanced, measurable positive stance. Time Efficiency was the most appreciated aspect, with 50% of respondents giving positive to very positive ratings. Most users agreed the AI chatbot saves time (3.46) and enables quicker content creation (3.44). The score of 3.28 on the item about creative block shows the chatbot's effectiveness in supporting brainstorming and idea flow.

Most respondents (85.2%) had used AI chatbots, and the average satisfaction score was 3.16. Respondents stated the chatbot helps produce more engaging content (3.26) and supports creative, trend-aligned idea generation (3.22). These results highlight the chatbot's flexibility and relevance, particularly for content creators (24.1%), digital marketers (14.8%), and freelancers (14.8%). While negative ratings remained consistent across indicators (around 14.8–16.7%), the general sentiment was positive, especially regarding work efficiency. Still, improvements in output quality and user experience are needed to boost satisfaction and adoption rates.

Interpretation Based on Chatbot Testing and Survey Results

The findings confirm that the AI chatbot is a productive tool for modern social media marketing. All indicators scored moderately to positively, with strong instrument reliability and validity. A total of 98.15% of respondents (53 out of 54) believed the chatbot could increase productivity in social media marketing. Qualitative feedback indicated the chatbot was useful for efficiency and ideation but had limitations in personalization, natural content tone, response speed, contextual understanding, and required human supervision. The average score of 3.39 on Time Efficiency demonstrates its significant role in streamlining brainstorming tasks. The chatbot integrates Claude 3.5 Sonnet and GPT-4o-mini-2024, making it more dynamic and creative than rule-based systems. Its features include:

- Dynamic search capabilities.
- Prompt automation tailored to tone, language, and platform (Instagram, TikTok, Facebook).
- Support for creative ideation and content customization.

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This makes the chatbot not just a technical tool, but a creative partner. The system helps maintain content frequency without compromising quality. On Content Quality and Relevance, the average score of 3.22 indicates that the AI supports brand-aligned and audience-relevant content. Continuous learning through NLP and ML allows the chatbot to improve recommendations and performance over time.

With a 3.28 score on "less creative block," the chatbot proves valuable in combatting creative fatigue. Users reported that it structured their content planning more efficiently, reducing the need to start from scratch. Teams could then focus on strategy and analysis, optimizing human resources and operational costs.

In terms of usability, the chatbot scored 3.16, suggesting it's accessible even to users without technical backgrounds. However, there were suggestions to improve flexibility in understanding informal or community-specific language. This calls for more localized NLP development.

Despite positive results, limitations remain. Some respondents found outputs too generic or impersonal, stemming from a lack of cultural nuance. AI cannot yet fully replace human creativity, especially for emotionally resonant content. Collaboration between AI and humans remains essential.

The chatbot showed difficulty with complex context in extended conversations, and response times varied based on input complexity.

In conclusion, the AI chatbot developed in this research is a strategic tool that improves productivity in social media marketing. It significantly enhances ideation, content generation, and time efficiency. While it supports creative professionals, human oversight is crucial for polishing and refining the content. Rather than being a threat, AI is a tool for amplifying creative workflows. Future optimization will make AI chatbots increasingly relevant as demand grows for fast, personal, and contextual digital content.

Conclusion

Overall, the AI-based prompt generator chatbot developed in this study has had a positive impact on social media marketing productivity. Leveraging generative AI and knowledge base integration, the chatbot

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provides faster and more practical solutions for marketers in creating trend-appropriate and engaging content. The research successfully built a functional prototype aligned with Technology Readiness Level 6 indicating a software system prototype that supports content automation in a social media marketing context.

The chatbot was developed using the Botpress platform and designed to understand user needs and provide contextual content suggestions. The prototyping method involved stages of requirement analysis, system development, testing, and evaluation. Key findings include:

a. Based on responses from 54 users, 98.15% agreed the chatbot supported their content idea brainstorming process indicating a high level of user acceptance, particularly among content creators and social media specialists.
b. In terms of time efficiency, the chatbot received an average score of 3.39 out of 4, showing that it significantly helped users save time by offering ready-to-use prompts based on categories, trends, and platform-specific needs (Instagram, TikTok, WhatsApp).
c. The relevance and quality of content were rated at an average of 3.22, suggesting the chatbot produces fresh and contextual ideas that align with brand communication styles—crucial for maintaining engagement and strengthening brand positioning.
d. The ease-of-use indicator scored 3.16, proving the chatbot was user-friendly, even for non-technical users. Its intuitive interface and conversational design contributed to a smooth user experience.
e. From a system quality perspective, blackbox testing confirmed all features functioned as expected, with responses generated in under 3 seconds. This demonstrates its readiness for broader implementation, including integration with WhatsApp, Telegram, or business websites.
f. The chatbot effectively helped users overcome creative blocks. The "overcoming content block" indicator scored 3.28, validating its usefulness as a creative assistant in maintaining a steady flow of content ideas.
g. Strategically, the chatbot enables marketing teams to focus more on high-level tasks like campaign planning and audience analysis

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by automating prompt generation. This saves time and manpower without compromising content quality.

h. A unique contribution of this study is its development of a chatbot tailored specifically for social media marketing in Indonesian, unlike general-purpose tools like ChatGPT or Jasper. Its local context training makes it especially suitable for small businesses and professional marketers.
i. In sum, the research demonstrates that AI chatbots can play a strategic role not only as technical tools but also as creative collaborators—enhancing efficiency, consistency, and competitiveness in digital marketing.
j. Nonetheless, some aspects still require improvement, particularly in personalization, contextual understanding, and output consistency. Enhancing these areas through algorithm refinement and additional features could elevate the chatbot's value even further.

Suggestions

Improve Output Quality

a. Upgrade the AI model to generate more natural and relevant content.
b. Develop content filters based on audience segmentation and current trends.
c. Regularly update the system with the latest digital marketing practices to ensure relevance.

Deeper Personalization & Performance Optimization

a. Integrate user preferences and historical data to generate more personalized outputs.
b. Optimize response speed and accuracy, especially for handling complex queries.

Further Research

a. Conduct comparative studies on different AI chatbot platforms.
b. Explore the long-term impact of chatbot usage on users' creativity.

Developers should consider integrating performance analytics so the chatbot can assess content effectiveness (e.g., reach, engagement, CTR). Users—especially marketing teams—are encouraged to learn basic prompt

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engineering to maximize chatbot utility. Educational institutions and industries should actively promote AI as a productivity tool rather than viewing it solely as an innovation. A synergy between technology, human creativity, and business strategy is key to building adaptive and sustainable marketing practices.

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