



# Artificial Intelligence as Human Behavior Detection for Auto Personalization Function in Social Media Marketing

R D Santy<sup>1</sup>, M I Habibillah<sup>2\*</sup>, Y R Dimiyati<sup>3</sup>, V S S Nofia<sup>4</sup>, S Luckyardi<sup>5</sup>, T V L Gaol<sup>6</sup>, D Oktafiani<sup>7</sup>

<sup>1,5</sup>Departemen Manajemen, Universitas Komputer Indonesia, Indonesia

<sup>2,3</sup>Departemen Ilmu Komunikasi, Universitas Komputer Indonesia, Indonesia

<sup>4,7</sup>Departemen Sastra Inggris, Universitas Komputer Indonesia, Indonesia

<sup>6</sup>Departemen Perencanaan Wilayah dan Kota, Universitas Komputer Indonesia, Indonesia

Email : \*irfan.habibillah@mahasiswa.unikom.ac.id

**Abstract.** Artificial intelligence is almost used in every aspect of human life, especially in marketing activities on social media, increasing its effectiveness. This study aims to determine how artificial intelligence's role in increasing marketing activities' effectiveness in automatic personalization. Some of the factors that can influence humans using social media are what they like, where they comment, and their type in the search fields on their social media. The method used in this research is a comparative descriptive method, namely describing or explaining and validating a phenomenon under study, then comparing it with other social media that has a different system. Some of the variables or objects studied in this paper are the user's habits in using social media and the artificial intelligence found on several social media that reacts with their users' habits. This study shows how artificial intelligence can increase the effectiveness of marketing activities on social media and produce comparable data between artificial intelligence technologies found in several social media, which shows that artificial intelligence is proven to increase marketing activities' effectiveness. It is done on social media.

## 1. Introduction

Artificial intelligence (AI) is an information technology that has been developing in the last ten years. Industries that utilize artificial intelligence are not only used in the telecommunications sector but are also widely applied in other sectors such as banking, services, manufacturing, and others. Artificial Intelligence (AI) is a general term that recommends utilizing a PC to show quick direct with inconsequential human intervention. The advancement of robots started computerized reasoning. The word robot comes from Czech "robota" which means biosynthetic machines used as obliged work [1].

The application of artificial intelligence technology is beneficial in monitoring social media to obtain a complete picture of the interactions that occur on social media. This technology is also helpful in marketing content following the habits of social media users [2].

Big data provides an overview of the growth and availability of structured and unstructured data. It can be used for analytical purposes on social media. This data can be



obtained by machine learning, a type of artificial intelligence system that allows the system to learn and adapt to incoming or outgoing data. Machine learning is often used to model a data set by studying it with a particular configuration/algorithm [3]. Artificial intelligence technology applied in social media has three primary analyses in carrying out its functions: sentiment analysis, audience analysis, and image analysis. These three analyzes work simultaneously in studying social media users' habits to decide the right content to display. These analyses provide adequate social media marketing support in optimizing audience, image analysis, and sentiment by identifying content interactions with high user engagement with social media [4]. Machine learning (ML) enables artificial intelligence software to identify social media user habits patterns from large data sets and big data and classify them to be tailored to social media marketing goals. Initially, this technology has been widely applied in the manufacturing industry, namely technology that includes intelligent manufacturing architecture technology, software-defined network system architecture technology, smart manufacturing standardization technology, and others. The application of artificial intelligence has begun to reach all industrial sectors, including the business sector [5].

Studies conducted by Hamet and Tremblay used Artificial Intelligence (AI) in medicine to clinical determination, clinical insights, and human science. AI in medicine consists of virtual and physical essential branches. The virtual joins informatics to control the board systems, including electronic prosperity records and specialists' dynamic course in their treatment decisions. The genuine branch is best addressed by robots used to help old patients or trained professionals. In like manner exemplified in this branch are centered around nanorobots, a wonderful new medicine movement system [6]. Likewise, Buch et al. Advising clinical dynamic through bits of knowledge from past information is the pith of proof-based medication. Customarily, measurable techniques have moved toward this undertaking by portraying designs inside information as numerical conditions. For instance, straight relapse recommends a 'line of best fit.' Through 'AI' (ML), AI gives procedures that reveal complex affiliations that can only significantly decrease to a condition [7]. Research conducted by Florea et used Artificial intelligence in education, one on how might AI improve training, help customize the learning experience, help educators in their undertaking, and its effect on e-learning, and the other on how schooling in AI must be imagined to make the work power needed to confront this new mechanical upset[8]. Studies conducted by Capatina et al. stated that the extending use of Artificial intelligence in social media advertising set off the prerequisite for this assessment to recognize and also examine such suspicions for likely customers of artificial intelligence-based programming for Social Media Marketing; an item that will be made in the accompanying two years, taking into account its future capacities [9]. These various studies show that artificial intelligence in today's world is the tool to detect human behavior for auto personalization function due to the utilization of artificial intelligence and the profound learning subtype.

This study aims to explore artificial intelligence and its application in business marketing. This study explores some of the literature to determine its relationship to marketing effectiveness based on human user behavior in using social media.

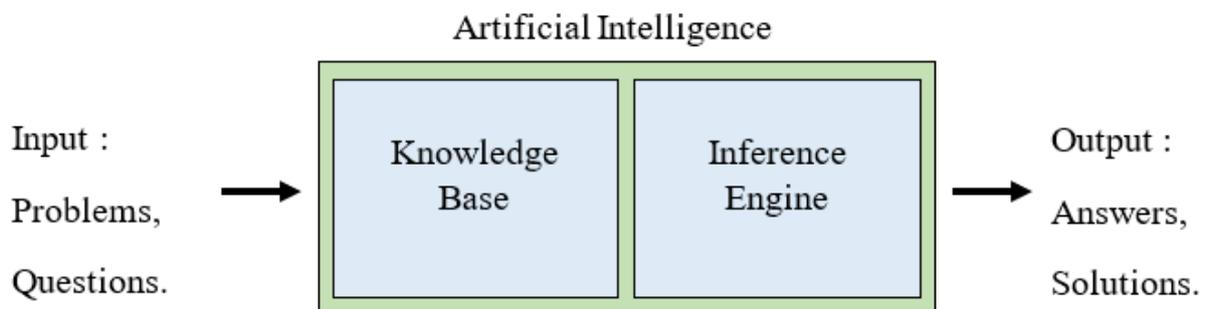
## 2. Method

A comparative descriptive method was used to describe or explain and validate the phenomenon under study. Then, it was compared to other social media that have a different system. Some of the variables or objects studied include user behavior in using social media; and artificial intelligence found on some social media that reacts with its users' habits.

### 3. Results and Discussion

#### 3.1 Artificial Intelligence and Machine Learning

Artificial intelligence is a computer science branch defined as a simulation of human intelligence programmed into a machine/system to behave and think like humans. There are two main parts needed in making artificial intelligence applications, including a knowledge base, which is the fact, theory, and connected data, and an inference engine, namely the ability to draw conclusions based on experience and knowledge [11]. The application of the concept of artificial intelligence to computers is shown in Figure 1.



**Figure 1.** Application of the concept of artificial intelligence to computers

Machine learning is a subfield of computer science that gives "computers the ability to learn without being explicitly programmed." Evolving from pattern recognition studies and computational learning theory in artificial intelligence, the study and construction of algorithms can learn and produce predictions from the incoming data due to machine learning exploration. The algorithm follows static program instructions by making predictions or data-driven decisions through modeling from the input sample. Machine learning is used in various computational tasks where designing and programming explicit algorithms with good performance are complicated.

Moreover, computational statistics is closely related to machine learning. It focuses on making predictions through computers. It has a strong relationship with optimization based on mathematical models, which provide theory, application domains, and methods to the field. Machine learning is sometimes combined with data mining, where the last subfield focuses more on exploratory data analysis and is known as unsupervised learning [12].

Machine learning can also be used unattended and used to study and establish basic behavioral profiles for various entities and then use it to find meaningful anomalies. In data analytics, machine learning is used to design complex models and algorithms suitable for prediction; this is known as predictive analytics in commercial use. These analytical models enable researchers, data scientists, engineers, and analysts to "produce reliable and repeatable decisions and results" and uncover "hidden insights" through learning from historical relationships and trends in data. Machine learning can be trained and validated to be used for data grouping, dimension reduction, data visualization, and trend analysis [12].

#### 3.2. Social Media Marketing



Social media marketing is another pattern and a quickly developing advertising organization method to arrive at focused clients effortlessly. Social media advertising is characterized as utilizing web-based media channels to advance an organization and its items. This marketing sort can be viewed as a web-based component, supplemented by a site-based advancement system, such as a web-based publicizing effort. The primary contrast between social media marketing and promoting, by and large, is the association that can be made among organizations and buyers [13]. Promoting utilizing social media can take numerous structures. For instance, Facebook includes the idea of "companions" in loving an item from a Facebook page or gathering, while Twitter is a mix of microblogging and interpersonal interaction. Twitter permits clients to get minor updates and ads from their #1 maker client accounts [14]. The fundamental points of interest of social media marketing are lessening costs and expanding reach. Social media stages cost not exactly other showcasing stages. Plus, online media showcasing permits organizations to arrive at clients who may not be open by the organization because of restricted time and area of existing circulation channels [15]. Social media gives sponsors induction to target groups and purchasers subordinate site page the region customers' tendencies and what their buddies love. By then, with wise displaying and publicizing, promoters can contact the most interested people concerning what they need to bring to the table. It is undefined from a confounding advancing structure that incorporates automated thinking, specifically AI, to consider online media customers' penchants or tendencies.

### *3.3. Artificial Intelligence in Social Media Marketing*

Artificial intelligence that is applied in web-based media showcasing is AI. This framework examines web-based media clients' conduct/propensities dependent on three primaries dissects: specific crowd examination, picture investigation, and assumption investigation, which are depicted as follows.

#### *A. Audience analysis*

The social media promoting technique embraced by numerous organizations, be it the innovation area or not, is upheld by human-made consciousness innovation dependent on crowd examination. Crowd investigation is now used to control shared messages and the right distribution time to accomplish showcasing objectives [16]. Organizations are looking to computerized reasoning innovation a ton since they can follow their individuals' affinities and interests and gather individuals with comparable interests. In this way, crowd examination can give a visual report on gathering individuals who rely upon the local area's worth [17]. Artificial knowledge with crowd investigation offers different exact scientific capacities in distinguishing openings, sensemaking, and dynamics [18]. Artificial intelligence consciousness innovation utilizes client-related information, such as buying deals or conducting and segmenting information. The outcome in moment proposals to web-based media clients about the correct item to purchase [19]. The job of human-made brainpower-based web-based media methodology is to create client bits of knowledge, make imparted thoughts and ideas to clients, and recommend new item dispatches and the correct items to purchase.

#### *B. Image analysis*

Artificial intelligence can be classified into three, among others: into three classifications: insightful computerized reasoning (logical AI), human-propelled AI, and acculturated AI.



Insightful artificial intelligence consciousness alludes to intellectual knowledge that utilizes learning dependent on past encounters to advise future choices. Artificial intelligence that falls into this classification utilizes picture acknowledgment or picture examination. Artificial intelligence is used to upgrade customized correspondence and to empower enhancements in focusing on [20]. Artificial intelligence in perceiving brand logos is used to examine the interests of online media clients. For instance, online media clients' photographs reflect practices, constantly needs that advertisers normally do not focus on.

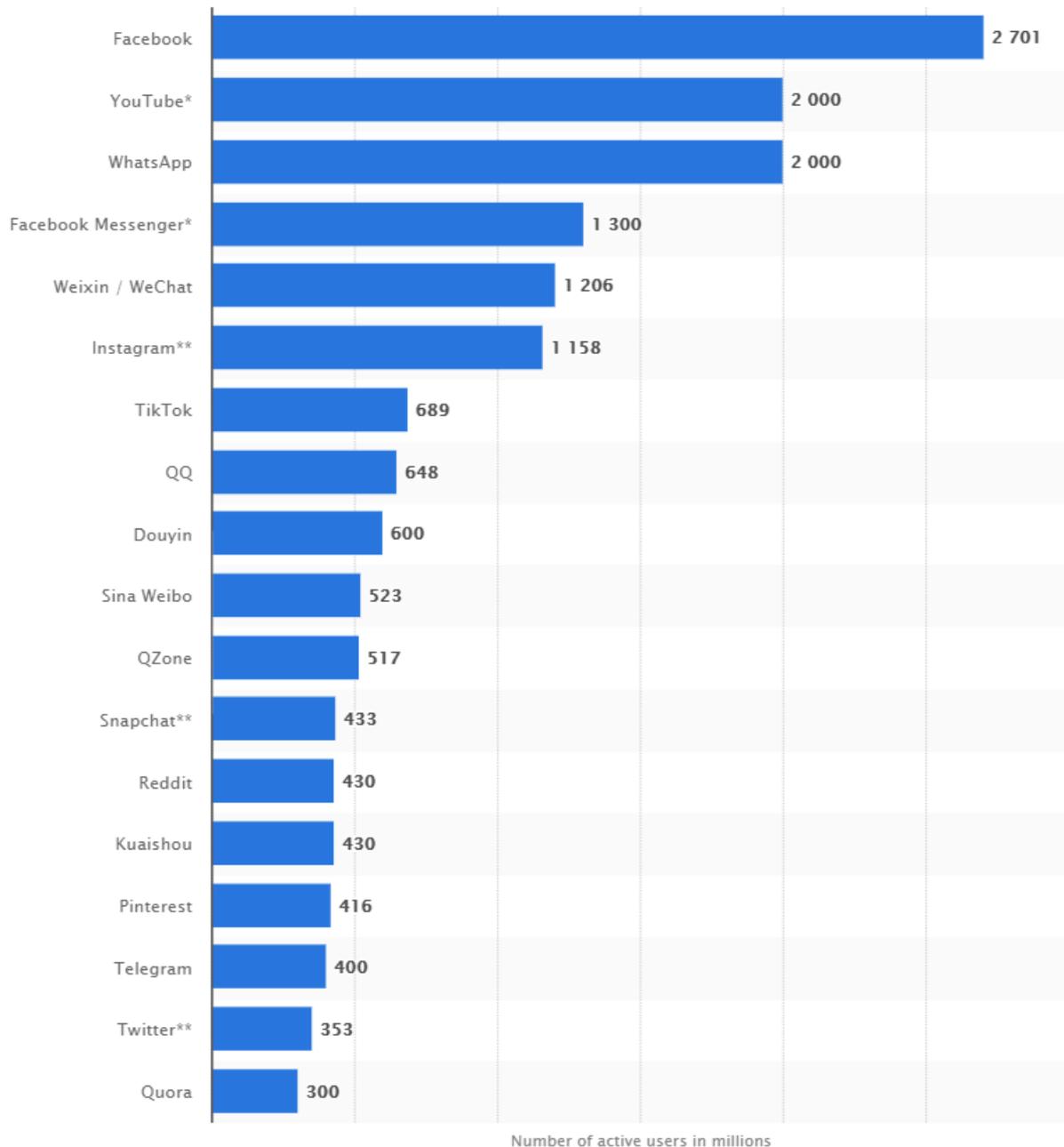
Nonetheless, images incorporate online media information to be utilized as an information source in web-based media advertising. Image content acknowledgment permits the framework to perceive things from pictures and burden them into literary portrayals. For instance, Image content shared through Instagram can offer wellbeing-related data. If the framework can remember it as a well-being classification, Instagram will offer more well-being-related substance [21].

### *C. Sentiment analysis*

Many studies show that sentiment analysis can be used to predict sales performance and product classification. Researchers are currently focusing on machine learning-based sentiment analysis used by social media, such as Twitter and Facebook, which focuses on unigram, bigram, speech tags, emoticons, and others. In the sentiment analysis, positive and negative comments from social media users are closely related to the popularity of a brand's post. Artificial intelligence technology leads to classifying and grouping user-generated content based on variables such as sentiment, topic, or theme [21]. Through sharing images, social media clients can communicate their suppositions. Subsequently, social media pictures offer an incredible asset with which to distinguish client conclusions. This strategy can be utilized successfully in social media showcasing, for example, item suggestion components or web-based media publicizing. Finally, large-scale social media content for sentiment analysis can use a consistent cross-modality regression model to use two lines of sentiment analysis, namely visual sentiment analysis and sophisticated textual sentiment analysis [22].

### *3.4. Artificial Intelligence Applications in Social Media Marketing*

Based on data compiled by Statista, a leading market, and consumer data provider company, Figure 2 shows the number of active users on the world's most popular social media platforms as of October 2020. The three largest platforms are Facebook, Youtube, and Whatsapp. Currently, Facebook has been widely used as a marketing medium. Therefore, machine learning application in obtaining user behavior data is significant to provide recommendations for uploaded content (posts) and product content being sold [23].



**Figure 2.** Number of most popular social network users as of October 2020 (in a million units)

Source: <https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/>

Practically speaking, the artificial intelligence consciousness framework is designed with natural language preparation in breaking down human language to get significance from sites, remarks, item surveys, and tweets. The volume of this information is gigantic, which is generally unstructured and comes from interpersonal organizations. It urges text mining to assume a part in social information investigation. Text mining looks at unstructured data and



recognizes examples of fundamental information rapidly. Preprocessing is the essential key in content mining, comprising three phases: tokenization, sifting, and lemmatization [24]. For instance, Facebook is a social media site with many users whose users share much information all the time. This information is in the form of unstructured data so that text mining can be used to obtain the important information so that Facebook can recognize the characteristics of its user behavior. The classification of text mining techniques is shown in Table 1.

**Table 1.** text mining technique

Technique	Concept
<b>Retrieval</b>	Take important facts from unstructured text
<b>Extraction</b>	Retrieves knowledge overview from structured databases
<b>Summarization</b>	Keeping the main points that have the same meaning
<b>Categorization</b>	Document-based classification, pattern mining
<b>Clustering</b>	Grouping documents into clusters (unsupervised learning), term-based ontology, k-means
<b>Filtering</b>	Supports vector engines

The decision of information factors in settling on choices on artificial intelligence consciousness innovation, for this situation, AI, is critical. An examination shows that information on sexual orientation, intergenerational perspectives, and occupation position are not huge elements when contemplating the degree of familiarity with applying AI to pursue employment destinations. The investigation clarifies that choosing information factors is vital in getting a suitable objective [25].

AI is firmly identified with settling on choice emotionally supportive networks and for examination. One of the primary advancements in computerized promoting methodologies is applying artificial intelligence brainpower frameworks to abbreviate the showcasing cycle and make business more successful. Utilizing AI to acquire an inside and out comprehension of buyer discernments and streamline item showcasing methodologies has been generally applied by numerous long-range informal communication stages. AI can be a helpful instrument for advanced advertisers, empowering them to unveil and comprehend information better and precisely.

As many as 2 billion monthly active users, Facebook automatically uses artificial intelligence to tag posts (posts). Meanwhile, LinkedIn uses machine learning and artificial intelligence for almost all of its products. LinkedIn uses an algorithm to predict a user's suitability for a role (job). It allows the system to highlight the suitable candidates for the appropriate information. Another case on Twitter is launching an update to its service using artificial intelligence technology to crop images using face detection or create entire images' thumbnails [26].



#### 4. Conclusion

The actual result of effective artificial intelligence-based programming in social media marketing depends intensely on artificial intelligence consciousness frameworks' capacity to investigate information and target substance or item commercials to social media clients. Artificial intelligence presents the next step of a marketing campaign. Artificial intelligence makes it possible to generate personal information and carry out successful marketing on social networking platforms. Companies today have the opportunity to use artificial intelligence technology to profile potential customers, analyze their behavior, follow their habits, determine their motivation, and so on. To offer a product or service that meets the needs and expectations of social media users. Social networking is an essential platform for business marketing, personalized relationships with customers, and knowing market or customer saturation. Artificial intelligence technology can make marketing campaigns more personal and smarter.

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