

## APPLICATION OF BIG DATA ANALYTICS FOR DECISION MAKING IN DIGITAL MARKETING

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### ABSTRACT

The growing development of technology gave birth to the existence of big data that can store a very large amount of information. The presence of big data provides opportunities for businesses. Business owners can utilize big data to generate data that can be used to provide an overview as a basis for decision making in conducting digital marketing activities. The method used is the documentation method with a qualitative approach. The data used is secondary data derived from various search engines such as Google Scholar and PubMed. Data analysis using the Miles and Huberman interactive model includes data condensation, data display and conclusions drawing. The results show that the application of big data analysis in digital marketing combines technological advances with a deep understanding of consumer behavior, enabling companies to optimize marketing strategies, improve operational efficiency, and respond more quickly to market changes, as well as make more informed decisions and improve corporate image, becoming the key to success in facing competition in today's increasingly complex and dynamic market.

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**Keywords :** *Big data; Decision making; Digital Marketing*

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### INTRODUCTION

Every year, information technology continues to develop and advance by leaps and bounds. The emergence of various systems and more sophisticated technologies requires to always accompany the development of existing technology (Nainggolan & Nasution, 2023). This technology facilitates efficient data management and drives innovation in information processing for decision-making and knowledge development. Big data is a new and important technological development that enables the storage and integration of enormous volumes of data from multiple sources (Ferdiansyah & Nasution, 2023).

Big Data is one of the main pillars in the industrial revolution 4.0, which is generated by technology development and automation. Data can be valuable if it has been converted into information, and Big Data experts say that the amount of data will grow faster in the future (Arifulsyah et al., 2023). This growth can be seen from the size of the data used, where the smallest size of data ever used is bits (binary digits) and has now reached petabytes (PB), and is expected to continue to grow beyond the size currently measurable by humans (Kurniawan, 2019).

In the economic aspect of society, there is an important role of communication that can affect marketing activities. Good and targeted communication will generate a positive response from consumers. Companies must master marketing communications to support sales figures (Syira et al., 2023). The right marketing and media strategies are used to be able to reach the intended market so that sales volume always increases and profit is with digital marketing (Gumilang, 2019). Currently, many people are interested in digital marketing to support various activities, one of which is for marketing media (Susanto et al., 2020). Digital marketing is a tool to promote their products that utilize internet media (Firdaus et al., 2022).

Pemasaran digital tidak mengharuskan penjual untuk bertatap muka dengan pembeli/pelanggan karena menggunakan media internet. Pada pemasaran digital data yang digunakan berasal dari sosial media dan website yang disebut dengan big data. Big data dapat dikelola dengan berbagai teknik sehingga menghasilkan data yang dapat digunakan untuk memberikan gambaran sebagai dasar pengambilan keputusan (Sofia et al., 2019).

Previous research conducted by Pangestu & Ikasar (2023) states that Big Data for business analytics has great potential in improving decision making, operational efficiency, and creating business value. By leveraging Big Data technology and infrastructure, organizations can collect, manage, and analyze data at scale. This enables them to identify new patterns, relationships, and

insights that support strategic decision making, customer understanding development, and business process optimization. The role of big data in the trading industry sector has several fairly specific roles including showing price distribution, consumer privacy protection, stock price forecasting, tax potential diggers, as corporate value creation management, business value liaison for strategy (Septa & Hoirul, 2022).

The novelty of this study is to analyze more deeply the process of big data analysis for decision making in digital marketing. One technology that can increase the effectiveness of a company's marketing is artificial intelligence (AI) (Octavio, 2023).

Technology that continues to develop causes all aspects of life to adjust. Including marketing aspects. The development of technology presents the existence of big data that can store various amounts of information in very large quantities. So that big data will help in the marketing process more, especially digital marketing. Thus, this study aims to analyze the application of big data analysis for decision making in digital marketing.

## **RESEARCH METHOD**

The research method used is a documentation method with a qualitative approach. The documentation method is a method of collecting data by seeing, studying, then recording data that has something to do with the object of research (Khosiah et al., 2019). Meanwhile, the qualitative approach is an approach used to examine for natural object conditions, where researchers are key instruments, data collection techniques are triangulated (combined), data analysis is inductive, and qualitative research results emphasize meaning rather than generalization (Apriyanti et al., 2019).

The data source used is a secondary data source. Secondary data is a data source that does not directly provide data to the data collector (Pratiwi, 2017). Data analysis using Miles and Huberman's interactive model includes Data condensation, Data Display and Conclusions drawing (Wanto, 2018).

## **RESULT AND DISCUSSION**

New technological advances that integrate the physical, digital, and biological worlds have affected all disciplines, economics, industry, and government. Allow devices to talk and connect with each other with centralized control (Setyowati & Nasir Ahmad, 2021). The rapid development of information and communication technology has penetrated all aspects including the economy, namely digital marketing, one form of digital marketing tools that can be utilized is social media as a marketing medium (Sanjaya et al., 2022).

Digital marketing is the application of digital technology that forms online channels to market (websites, e-mail, databases, digital TV and through various other recent innovations including blogs, feeds, podcasts, and social networks) that contribute to marketing activities aimed at making profits and building and developing relationships with customers in addition to developing a planned approach to increase knowledge about consumers (to the company, its behavior, values and level of loyalty to its brand), then unify targeted communications with online services according to the specific needs of each individual or customer. In short, digital marketing is achieving marketing goals through the application of technology and digital media (Jasri et al., 2022). Many ways can be used today to sell products digitally such as the use of social media, marketplaces and websites that provide information and also as a promotional strategy (Herdiansah, 2021).

The development of internet technology has also given birth to a system, namely big data as a giant warehouse that holds all information (Florid et al., 2023; Solihin, 2021). The importance of big data in the modern era is revealed in the phenomenon where the income of various industrial sectors is through extracting the most suitable and useful information in creating strategies or business opportunities that they manage. Sources of information can be through social media, consumer transaction data, to service data that is of interest to the market. The more complex the information you want to obtain and analyze, the greater the data that will be extracted.

The purpose or main thing of this Big Data phenomenon is, there is a very exponential growth of data and information, speed in data accretion (volume), and increasingly varied content of the data that has the potential to create new challenges, new opportunities, and new sales or marketing strategies. This indicates that optimal data processing in a big data warehouse will be able to maximize the company's goal of winning the competition (Mantik & Awaludin, 2014).

Big Data is a term given to data sets that are very large and complex, making it impossible to process using conventional database management devices or other data processing applications (Duha et al., 2022). Big data is a collection of very large and complex data sets, which makes it very difficult to process using only ordinary database management or traditional data processing applications (Aldisa et al., 2022).

Big Data refers to the 3V's: volume, variety, velocity, and some add other V elements such as *veracity* and *value*. Volume (data capacity) relates to the size of data storage media that is very large or may be unlimited to units of petabytes or zettabytes; variety (data diversity) related to the type or types of data that can be processed ranging from structured data to unstructured data; While velocity (speed) is related to the speed of processing data generated from various sources, ranging from batch data to real time, while the characteristics of veracity (truth) and value (value) are related to the uncertainty of data and the value of the benefits of the information produced (Turmuzi et al., 2023).

The role of Big Data in the industrial sector has been going on for a long time with the main reasons being efficiency, time saving, and cost. Other reasons include increased effectiveness. Companies engaged in the business sector have the main orientation on achieving the highest possible profit margin (profit oriented) (Oktatriani et al., 2023). Various important information can be generated from Big Data that can support the decision-making process for company leaders as follows:

- a. Knowing the public's response to the products issued through sentiment analysis on social media.
- b. Helping companies make more informed and accurate decisions based on data.
- c. Helps improve the company's image in the eyes of customers.
- d. Business planning, by knowing customer behavior such as telecommunications and banking companies.
- e. Know market trends and consumer desires.

The occurrence of the industrial revolution 4.0 will certainly have an impact on the reduced use of human resources in the production process, because the process has almost entirely been replaced by machines and robots that can be programmed independently and remotely through cloud computing technology and the internet of things as stated by Bal and Erkan (2019), the data is then processed using big data technology and artificial intelligence which will provide output in the form of suggestions for improvements and efficiency of the production process to management.

A good marketing strategy must be supported by the ease of information technology to be able to obtain accurate and real-time information. In the digital era like now, an effective and efficient marketing monitoring information system can make a major contribution in supporting marketing activities. With a good monitoring information system, marketing decision making can be more targeted because it is based on accurate and real-time data. Some of the latest trends and approaches in this research include, Application of artificial intelligence, Use of AI techniques such as machine learning, neural networks, and natural language processing algorithms in data analysis of marketing monitoring information systems to identify patterns, trends, and customer behavior. This helps in smarter and timely strategic decision making. Big data analysis, utilizing sophisticated technology and analytical methods to process large volumes of data generated by marketing monitoring information systems. This allows organizations to gain deeper insights into customer preferences, market trends, and strategic opportunities (Sugiana & Musty, 2023).

Marketing stimulus carried out by marketers relies heavily on the internet and big data as the trigger. The amount of data spread becomes a medium for making purchasing decisions. Big data has been used in many businesses. Not only is the magnitude of the data the main point but

what the organization should do with the data. In the world of marketing, this big data analysis can be used to identify consumer behavior in interacting and transacting online. So that marketers are able to develop marketing strategies where marketers can plan, create, and distribute content that is able to attract target consumers to immediately make purchase decisions (Sudarsono, 2020).

Data sources from big data can be structured and unstructured data, so human resources who master this problem are needed. Structured data has defined data types, formats, and structures. Data can be transactional data, OLAP data, traditional RDBMS, CSV files, simple spread-sheets. While unstructured data is textual data with erratic formats or does not have an inherent structure, so to make it structured data requires more effort, tools, and time (Solihin, 2021).

To get maximum results from the information received as a result of Big Data, companies will utilize Big Data Analytics to facilitate information analysis. Big Data Analytics itself is a process of extracting information used to find patterns (such as customer behavior patterns) or trends (such as market trends) based on the data obtained. Big data not only simplifies the process of storing data but also greatly facilitates the process of data mining. Data that has been processed with Big Data Analytics will provide useful information for the Company which is then used as a guide for decision making. Data source and quality are also one of the keys to providing the right information so that companies can make the right decisions in Purnama, (2022) in (Adyastuti & Khafid, 2022).

The development of technology gives birth to big data that can help humans. Big data can collect very large information so that humans with various techniques can process the data to streamline their business activities. With big data can help companies to make decisions in digital marketing.

## **CONCLUSION**

Based on the results of the study, it was found that the application of big data analysis in digital marketing is a vital strategy that combines technological advances with the need for a deep understanding of consumer behavior. By utilizing information and communication technology and large sources of information from big data, companies can optimize marketing strategies, improve operational efficiency, and respond to market changes more quickly. Big data analytics enable companies to take more informed decisions, improve corporate image, and plan more effective marketing strategies, becoming the key to success in facing competition in today's increasingly complex and dynamic market.

## **REFERENCES**

- Adyastuti, N. A., & Khafid, M. (2022). Pengaruh Ukuran Perusahaan, Leverage dan Profitabilitas terhadap Manajemen Laba dengan Kompensasi Bonus sebagai Variabel Moderating. *Owner*, 6(2), 2071–2084. <https://doi.org/10.33395/owner.v6i2.830> [Google Scholar](#)
- Aldisa, R. T., Maulana, P., & Abdullah, M. A. (2022). Penerapan Big Data Analytic Terhadap Strategi Pemasaran Job Portal di Indonesia dengan Karakteristik Big Data 5V. *Jurnal Sistem Komputer Dan Informatika (JSON)*, 3(3), 267. <https://doi.org/10.30865/json.v3i3.3905> [Google Scholar](#)
- Apriyanti, Y., Lorita, E., & Yusuarsono, Y. (2019). Kualitas Pelayanan Kesehatan di Pusat Kesehatan Masyarakat Kembang Seri Kecamatan Talang Empat Kabupaten Bengkulu Tengah. *Profesional: Jurnal Komunikasi Dan Administrasi Publik*, 6(1). <https://doi.org/10.37676/profesional.v6i1.839> [Google Scholar](#)
- Arifulsyah, H., Heri Ribut Yuliantoro, & Abdi Bhayangkara. (2023). Pengaruh Penerapan Analisis Big Data Dalam Pengambilan Keputusan Investasi Saham. *Jurnal Akuntansi Keuangan Dan Bisnis*, 16(2), 169–178. <https://doi.org/10.35143/jakb.v16i2.6206> [Google Scholar](#)
- Bal, H. Ç., & Erkan, Ç. (2019). Industry 4.0 and Competitiveness. *Procedia Computer Science*, 158, 625–631. <https://doi.org/10.1016/j.procs.2019.09.096> [Google Scholar](#)

- Duha, T., Nurul Fajriyah, Wawan Setiawan, & Ernawati Dewi. (2022). Implementasi Teknologi Big Data di Era Digital. *Jurnal Informatika*, 1(1), 1–7. <https://doi.org/10.57094/ji.v1i1.333> [Google Scholar](#)
- Ferdiansyah, V., & Nasution, M. I. P. (2023). Penerapan Teknologi Big Data dalam Pengembangan Database Pendidikan. *Jurnal Riset Manajemen*, 1(3), 22–29. <https://doi.org/https://doi.org/10.54066/jurma.v1i3.591> [Google Scholar](#)
- Firdaus, M. I., Azizah, P. N., & Sa'adah, R. (2022). Pentingnya Digital Marketing Sebagai Strategi Pemasaran UMKM di Era 4.0. *Jurnal Graha Pengabdian*, 4(2), 154. <https://doi.org/10.17977/um078v4i22022p154-162> [Google Scholar](#)
- Florid, M. I., Hendra, R. F., & Purnamasari, P. (2023). The Influence of Accounting Information Systems, Internal Control Systems and The Implementation of Good Corporate Governance In Efforts to Prevent FRAUD. *Return : Study of Management, Economic and Bussines*, 2(2), 106–117. <https://doi.org/10.57096/return.v2i2.66> [Google Scholar](#)
- Gumilang, R. R. (2019). Implementasi Digital Marketing terhadap Peningkatan Penjualan Hasil Home Industri. *Coopetition : Jurnal Ilmiah Manajemen*, 10(1), 9–14. <https://doi.org/10.32670/coopetition.v10i1.25> [Google Scholar](#)
- Herdiansah, A. G. (2021). Pengembangan Potensi Kewirausahaan dengan Prinsip Penta Helix di Desa Margamekar Kabupaten Sumedang. *Kumawula: Jurnal Pengabdian Kepada Masyarakat*, 3(3), 539. <https://doi.org/10.24198/kumawula.v3i3.31078> [Google Scholar](#)
- Jasri, J., Arfan, N., Hasanuddin, H., & Ali Hasan, H. (2022). Penerapan Digital Marketing dalam Upaya Peningkatan Pendapatan Usaha Mikro Kecil dan Menengah. *ILTIZAM Journal of Shariah Economics Research*, 6(2), 212–224. <https://doi.org/10.30631/iltizam.v6i2.1452> [Google Scholar](#)
- Khosiah, K., Hajrah, H., & Syafril, S. (2019). Persepsi Masyarakat Terhadap Rencana Pemerintah Membuka Area Pertambangan Emas di Desa Sumi Kecamatan Lambu Kabupaten Bima. *JISIP (Jurnal Ilmu Sosial Dan Pendidikan)*, 1(2). <https://doi.org/10.58258/jisip.v1i2.219> [Google Scholar](#)
- Kurniawan, C. (2019). A Survey on Big Data Analytics Model. *ITEJ (Information Technology Engineering Journals)*, 4(1), 1–13. <https://doi.org/10.24235/itej.v4i1.46> [Google Scholar](#)
- Mantik, H., & Awaludin, M. (2014). Revolusi Industri 4.0: Big Data, Implementasi Pada Berbagai Sektor Industri (Bagian 2). *Jurnal Sistem Informasi Universitas Suryadarma*, 10(1). <https://doi.org/10.35968/jsi.v10i1.991> [Google Scholar](#)
- Nainggolan, N. S., & Nasution, I. P. (2023). Pentingnya Keamanan Big Data Dalam Lembaga Pemerintahan Di Era Digital. *Jurnal Sains Dan Teknologi (JSIT)*, 3(2), 253–257. <https://doi.org/10.47233/jsit.v3i2.883> [Google Scholar](#)
- Octavio, M. (2023). *Kegiatan Marketing Modernserta Penggunaan Kecerdasan Buatan(AI)untuk Meningkatkan Efektivitas PemasaranPerusahaan*. [Google Scholar](#)
- Oktatriani, A., Putri, C. D., & Terttiaavini, T. (2023). Peran Analisis Big Data dalam Sektor Industri Di Indonesia. *JNKTI: Jurnal Nasional Komputasi Dan Teknologi Informasi*, 6(3), 407–410. [Google Scholar](#)
- Pangestu, R. A., & Ikasari, I. H. (2023). Penerapan Sistem Informasi Manajemen Berbasis Big Data untuk Analisis Bisnis. *AI Dan SPK : Jurnal Artificial Intelligent Dan Sistem Penunjang Keputusan*, 1(1), 64–67. [Google Scholar](#)
- Pratiwi, N. I. (2017). Penggunaan Media Video Call Dalam Teknologi Komunikasi. *Jurnal Ilmiah Dinamika Sosial*, 1(2), 202–224. <https://doi.org/https://doi.org/10.38043/jids.v1i2.219> [Google Scholar](#)
- Sanjaya, A., Nursandy, F. L., Lisvia, L., & Nurlita, Y. S. (2022). Pemanfaatan Digital Marketing Dalam Memasarkan Produk di Masa Pandemi Covid-19. *Jurnal Plakat: Jurnal Pelayanan Kepada Masyarakat*, 3(2), 167–181. [Google Scholar](#)
- Septa, S., & Hoirul, H. (2022). Peran Big Data pada Sektor Industri Perdagangan: Tinjauan Literatur pada Perusahaan Bidang Perkantoran. *Journal of Office Administration : Education and Practice*, 2(3), 198–210. <https://doi.org/10.26740/joae.v2n3.p198-210> [Google Scholar](#)

- Setyowati, L., & Nasir Ahmad, D. (2021). Pemanfaatan Big Data Dalam Era Teknologi 5.0. *ABDINE: Jurnal Pengabdian Masyarakat*, 1(2), 117–122. <https://doi.org/10.52072/abdine.v1i2.205> [Google Scholar](#)
- Sofia, D., Sekarpuji, P., Fauziah, F., & Raya, A. M. (2019). Analitik Big Data Untuk Peramalan Pemasaran Obat. *Jurnal INSTEK (Informatika Sains Dan Teknologi)*, 4(2), 230–238. <https://doi.org/https://doi.org/10.24252/instek.v4i2.11002> [Google Scholar](#)
- Solihin, O. (2021). Implementasi Big Data pada Sosial Media sebagai Strategi Komunikasi Krisis Pemerintah. *Jurnal Common*, 5(1), 55–66. [Google Scholar](#)
- Sudarsono, S. (2020). Pengaruh Big Data, Content Marketing, Artificial Neural Networks Terhadap Minat Beli dan Keputusan Pembelian Secara Online di Indonesia. *Seminar Nasional Kepariwisata (SENORITA)*. [Google Scholar](#)
- Sugiana, N. S. S., & Musty, B. (2023). Analisis Data Sistem Informasi Monitoring Marketing; Tools Pengambilan Keputusan Strategic. *Jutisi: Jurnal Ilmiah Teknik Informatika Dan Sistem Informasi*, 12(2), 696–708. [Google Scholar](#)
- Susanto, B., Hadianto, A., Chariri, F. N., Rochman, M., Syaukani, M. M., & Daniswara, A. A. (2020). Penggunaan Digital Marketing untuk Memperluas Pasar dan Meningkatkan Daya Saing UMKM. *Community Empowerment*, 6(1), 42–47. <https://doi.org/10.31603/ce.4244> [Google Scholar](#)
- Syira, S. D., Fauzi, A., Woestho, C., Vilani, L., Firmansyah, P. D., Pratama, D. R., Apriliana, A. D., Ghaffar, N. S. A., & Putri, D. A. (2023). Pemanfaatan Big Data dalam Peningkatan Efektivitas Strategi Komunikasi Marketing Terpadu pada Perusahaan E-Commerce. *Jemsi: Jurnal Ekonomi Manajemen Sistem Informasi*, 4(5), 891–900. [Google Scholar](#)
- Turmuzi, I. H., Mellenia, D., & Fadhlih, U. I. (2023). Implementasi Teknologi Big Data di Pemerintahan Indonesia. *Jurnal Jawara Sistem Informasi*, 1(1). [Google Scholar](#)
- Wanto, A. H. (2018). Strategi Pemerintahan Kota Malang dalam Meningkatkan Kualitas Pelayanan Publik Berbasis Konsep Smart City. *JPSI (Journal of Public Sector Innovations)*, 2(1), 39. <https://doi.org/10.26740/jpsi.v2n1.p39-43> [Google Scholar](#)