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**Applicazioni dell'intelligenza artificiale al marketing
digitale e l'impatto dell'IA generativa sui social media**

**Artificial Intelligence applications to Digital Marketing
and the impact of GenAI on social media**

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Ai miei genitori
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ABSTRACT

Questa tesi esplora le applicazioni dell'intelligenza artificiale al mondo del marketing digitale, valutando l'impatto della combinazione delle due discipline. Tra queste, viene posta particolare attenzione al ruolo dell'IA generativa nel social media marketing per la generazione di contenuti.

A partire dalla definizione di intelligenza artificiale e dalla sua storia, la ricerca approfondisce le diverse tipologie di IA nonché i vari modelli di Machine Learning e Deep Learning che nel tempo sono stati sviluppati. La tesi procede quindi con l'analisi dell'impatto dell'IA e delle sue componenti sul marketing digitale, mostrando i principali benefici dell'adozione di questa tecnologia da parte dei marketers. In modo speculare, si valuta il ruolo dell'IA generativa nel customer engagement attraverso la generazione di contenuti innovativi e di alta qualità per i social media. Le implicazioni dell'AI marketing vengono esplorate anche da una prospettiva pratica, individuando per ciascuna applicazione dei casi studio reali di aziende che hanno ottimizzato i propri processi di marketing attraverso l'IA. Dallo studio di questi casi pratici emerge come l'intelligenza artificiale stia trasformando il modo in cui le aziende interagiscono con i clienti e generano valore, attraverso specifiche tecnologie, come i chatbots, gli assistenti virtuali e i sistemi di raccomandazione, o attraverso l'automazione e il miglioramento di processi chiave come la segmentazione, l'analisi competitiva, l'e-mail marketing e l'ottimizzazione per i motori di ricerca.

Infine, le principali preoccupazioni etiche relative allo sviluppo e all'utilizzo di questa tecnologia sono analizzate, sottolineando come ad ogni innovazione si accompagnino sempre dubbi, paure e perplessità.

Le varie analisi sono state condotte tramite una revisione della letteratura scientifica, individuando e analizzando le principali pubblicazioni sul tema.

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INTRODUCTION

Artificial Intelligence has now entered all sectors of our society. From the medical sector to information, from education to industry and even the automotive one, every sector is experiencing the benefits of this new technology which presents itself as the new great revolution in our society. In business, one of the most impacted sectors is digital marketing where AI's ability to process data and provide responses based on it appears like a game changer. An in-depth knowledge of the customer and his needs, a clearer understanding of the market and personalization up to an individual level are just some of the benefits that algorithms can bring to this discipline.

This thesis explores the main applications of Artificial Intelligence in digital marketing with the aim of identifying the benefits and relationships of this combination. Furthermore, a focus on the impact of Generative Artificial Intelligence on social media is proposed. The methodology used for these purposes is that of literature review: numerous scientific articles, blogs and other sources were researched and subsequently selected, with the aim of identifying those most relevant to the objective of this thesis. The chosen publications were then analyzed to identify strengths and weaknesses and key findings from the various studies. Finally, the information collected were summarized and organized for the analyses necessary for the thesis.

The structure of the thesis is composed of four chapters.

In the first chapter the theoretical framework is outlined, retracing the historical evolution of AI and GenAI, presenting the different models and stages of AI development, as well as the disciplines that are part of it, specifically Machine Learning and Deep Learning. Also, an overview of the dynamics of digital marketing and the role of social media in this discipline is offered.

In the second chapter, the relationship between AI and digital marketing is analyzed, identifying the links that may arise between the two disciplines. Furthermore, the impact that this technology has on digital marketing is evaluated, presenting the main benefits from both a qualitative and quantitative point of view. A similar structure is followed for Generative AI and social media, identifying the connections between the two subjects and studying the impact of AI-generated content on customer engagement.

The third chapter is dedicated to the analysis of the main applications of AI to digital marketing, for which the implications are identified. For each of them, one or more real case studies are also proposed, to analyze how companies are already implementing AI in their processes on a practical level.

Finally, in the last chapter, the main ethical problems of the development and use of AI in business are outlined to highlight that if on the one hand AI provides great benefits for companies, on the other it gives rise to challenges and issues that must be adequately addressed.

CHAPTER 1 – THEORETICAL FRAMEWORK

Artificial Intelligence is considered a revolution in marketing so much so that it has been claimed that its implementation will change the future of marketing.¹ The applications of this discipline to marketing are various with a very strong impact on efficiency.

It's not a mystery that a lot of companies has already implemented AI systems and the investments are raising: let's think about Netflix with its recommendations system,² Apple with Siri,³ and many more.

The application of AI to marketing can enhance existing tools and strategies but also creates new way of generating value, both for customers and companies.⁴

Before diving into the applications of artificial intelligence in digital marketing it is useful to understand the boundaries of this topic and the evolution of this discipline over the years.

Also, a quick review of the current state of digital marketing is presented.

¹ Cf. Davenport et al. (2020) p. 24.

² Cf. Netflix, n.d. (online).

³ Cf. Apple (2017), n.d. (online).

⁴ Cf. Haleem et al. (2022) p. 120.

1.1 Definition and history of Artificial Intelligence

Defining Artificial Intelligence is not simple because there is not a unique and universally accepted definition for this discipline: there is a proliferation of definition, but the “problem” is still open.⁵

To better understand the boundaries of this matter we can start from the meaning of the two terms: “artificial” and “intelligence”.

Oxford Languages defines “artificial” as “made or produced by human skills rather than occurring naturally, especially as a copy of something natural”.⁶

Even for “intelligence” there is not a unique definition but one could be: “the ability to learn, understand, and make judgments or have opinion that are based on reason”.⁷

If we combine these two elements with the technological component, we can define Artificial Intelligence as: “a variety of intelligent human behaviors, such as perception, memory, emotion, judgment, reasoning, proof, recognition, understanding, communication, conception, thought, learning, forgetting, creating, etc. which can be achieved artificially by machine, system or network”.⁸

⁵ Cf. Dobrev (2005) p. 67.

⁶ Oxford English Dictionary, n.d. (online).

⁷ Cambridge Dictionary, n.d. (online).

⁸ Deyi/Yi (2017), p. 1.

Beyond the terminological issue, it is interesting to note that the main objective of the discipline is to reproduce the way of thinking and acting of human being in a machine.

Systems that think and take decisions could sound like a futuristic idea but the origins of artificial intelligence date back to XVII century: Blaise Pascal (in 1642) and Gottfried Wilhelm von Leibniz (in 1674) were both driven by the intention of creating a machine that could think as a human (in the specific field of math).

Similarly, in early 1830s Charles Babbage created the “Analytical Engine”, the first prototype of a computer to perform general tasks.⁹

However, the first big step in the evolution of AI is the book “*On Computable Numbers, with an application to the Entscheidungsproblem*”, published in 1936 by Alan Turing.¹⁰ Considered the father of Artificial Intelligence, the mathematician, in his book lays the foundations of calculability, computability and the Turing machine. This was an abstract machine that, according to a set of rules, moved from one state to another scanning symbols on a one-dimensional tape.¹¹

⁹ Cf. Garnham (2017), p. 4.

¹⁰ Cf. Grzybowski et al. (2024) p. 4.

¹¹ Cf. De Mol (2021) n.d. (online).

In 1950 Turing published “*Computing Machines and Intelligence in the Mind*” in which he introduced the “Turing test”,¹² a test to prove the intelligence of machine.

The following year, at University of Manchester, the first working AI programs were created: Christopher Strachey wrote a checkers-playing program while Dietrich Prinz made a chess-playing program.¹³

1956 was a very significant year for Artificial Intelligence. Allen Newell, J.C. Shaw and Herbert A. Simon wrote a computer program, called “Logic Theory Machine”, to solve math problems.¹⁴ This is considered the first usage of AI computer technology.

In the same year, John McCarthy used the term “Artificial Intelligence” for the first time to name a conference held at Dartmouth College.¹⁵ This event marks the birth of AI as a discipline.

The 1950s and the 1960s were a period of great enthusiasm and growing expectations towards Artificial Intelligence. In fact, an increasing number of machines and programs were created in this period.

¹² Cf. Mijwel (2015) p. 3.

¹³ Cf. Grzybowski et al. (2024) p. 5.

¹⁴ Cf. Garnham (2017), p. 6.

¹⁵ Cf. Grzybowski et al. (2024) p. 5.

In 1957, Herbert A. Simon, J. C. Shaw and Allen Newell created the General Problem Solver (GPS) that was intended to imitate man's problem-solving methods.¹⁶

In 1965, Edward Feigenbaum starts to develop a software to identify unknown organic molecules using scientific data, called "DENDRAL".¹⁷

In this period, at MIT, Joseph Weizenbaum developed a computer program to explore communication between humans and computers, called "ELIZA".¹⁸ This is considered the first chatbot of history, a technology that will be crucial in marketing in the following decades.

In the 1970s and 1980s the enthusiasm about Artificial Intelligence waned: the computational and technological level was not enough to realize the expectations and governments began to cut funding for AI research.¹⁹

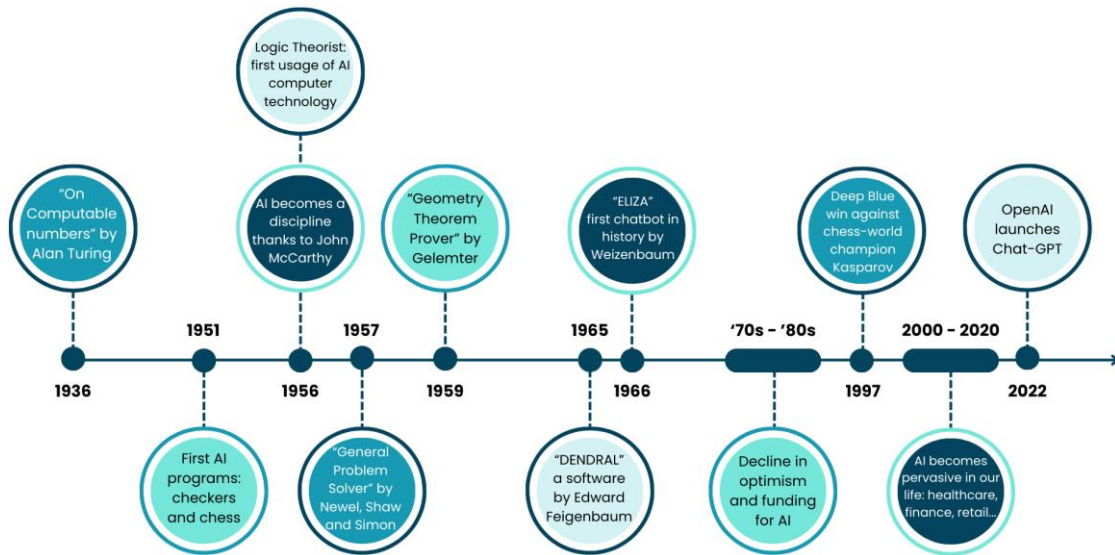
¹⁶ Cf. Haenlein/Kaplan (2019) p. 3.

¹⁷ Cf. Grzybowski et al. (2024) p. 5.

¹⁸ Cf. Zemčík (2019) p. 15.

¹⁹ Cf. Haenlein/Kaplan (2019) p.p. 3-4.

Fig. 1- AI TIMELINE



Source: personal elaboration

As we can see from Fig. 1, which describes the main steps of the evolution of AI, the event that put back the spotlight on AI was a chess game. In 1997, the AI program Deep Blue by IBM won a match against Garry Kasparov, the world chess champion (at that time).²⁰

In the new millennium, the applications of AI have multiplied expanding in all areas of daily life. There are many examples: virtual assistants, like *Siri* or *Cortana*, are powered by AI; e-commerce, like Amazon, or streaming platform, like Netflix, use Artificial Intelligence to recommend products or films/TV series

²⁰ Cf. Mijwel (2015) p. 3.

based on customer's preferences; in healthcare, Artificial Intelligence is used to monitor patient's parameters or to identify diseases: banks use Artificial Intelligence to personalize customer's experience on mobile devices as well as protect sensitive data and avoid fraud; almost every medium-big company has a chatbot that deals with customer care.

In 2022, OpenAI introduced *ChatGPT*, one of the most advanced chatbot, designed to generate human-like text responses given a prompt or input.²¹ Even though this program was criticized for its tendency to "hallucinate" ("a phenomenon in which an AI responds with factually incorrect answers with high confidence"²²) it gained much popularity, reaching 100 million users in January 2023.

Although Artificial Intelligence is having a major impact on our life, not everyone is enthusiastic about this new technology; a growing number of people has started to fear Artificial Intelligence, believing in a dystopian future in which machines will take control of the world exterminating human being.²³

Among those who believe that AI could be a threat there are also prominent figures of our time such as Elon Musk, Steve Wozniak, Sam Altman, and Bill

²¹ Cf. OpenAI (2022) n.d. (online).

²² Grzybowski et al. (2024) p. 6.

²³ Cf. Aggarwal et al. (2022) p. 115.

Gates. All these technological leaders have launched appeals for a more conscious and responsible development of AI programs.

In February 2024, another big step for Artificial Intelligence has been made: ChatGPT-4, the last version of OpenAI's bot, successfully completed the Turing Test. According to the study conducted by Stanford University, ChatGPT-4 has a personality that is totally comparable to that of a human, making the distinction between man and machine practically impossible.²⁴

1.2 Types of Artificial Intelligence

The first distinction about Artificial Intelligence is between “weak” and “strong” AI.

- Weak AI: refers to machines created with the aim of solving specific tasks for humans.²⁵ These programs are specialized in certain functions but are not equipped with autonomous thinking,²⁶ requiring human presence to proper function. Some examples are: chatbots, email spam filters, self-driving cars...

²⁴ Cf. Mei et al. (2024) p. 8.

²⁵ Cf. Wang/Siau (2019) p. 62.

²⁶ Cf. Martinez (2019) p. 1028.

- Strong AI: refers to machines equipped with autonomous thinking, capable of reasoning like a human being.²⁷ There are no concrete examples of strong Artificial Intelligence yet because we are not yet capable of developing such a technology.²⁸

Systems that belong to weak AI try to simulate human intelligence in a specific task while strong AI concerns computational machine that have human intelligence.²⁹

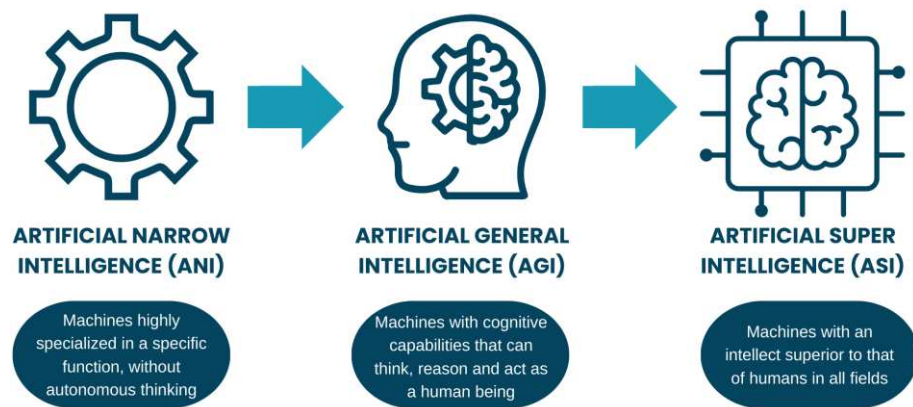
A second distinction concerns the evolutionary stage of AI. Accordingly, we find: Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI) and Artificial Super Intelligence (ASI). Fig. 2 provides a brief description of these stages.

²⁷ Cf. Liu (2021) p. 3.

²⁸ Cf. Aggarwal et al. (2022) p. 117.

²⁹ Cf. Liu (2021) p. 3.

Fig. 2- STAGES OF AI EVOLUTION PROCESS



Source: personal elaboration

Artificial Narrow Intelligence finds application in systems that are highly specialized in a specific function; these systems are not equipped with an autonomous thinking, but they use human-like capabilities.³⁰

ANI is the current step of the AI evolutionary process, and the applications are everywhere around us. For examples, we can think about chatbots and self-driving cars as well as recommendation systems and stock trading.³¹ An application of this technology to marketing could be an algorithm that, based on previously collected data, can identify similar characteristics between groups of customers and segment the customer base.

³⁰ Cf. Zhu et al. (2021) p. 1.

³¹ Cf. Pohl (2015) p. 1. f.

Artificial General Intelligence refers to systems that possess cognitive capabilities, meaning they can “reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly, and learn from experience”.³²

Even if this was the original goal of Artificial Intelligence, we have not yet reached this level. Creating a machine with the same level of consciousness as humans requires computational capabilities and technological skills that we don’t have yet and the debate on this topic is still open.

The last step is Artificial Super Intelligence that concerns the creation of systems with an intellect far superior to the human one in all field of interests. In the common imagination, this is the dystopian situation in which machines will take control by eliminating human being.³³ This is the reason why a lot of people, including prominent figures, are asking for a slowdown in the race for AI development.³⁴ Certainly, regulation and a sense of responsibility in the development of AI machines is necessary. However, it should be noted that, at present, the realization of this objective is almost a utopia.

³² Gottfredson (1997) p. 13.

³³ Cf. Pohl (2015) p. 10.

³⁴ Cf. Zhu et al. (2020) p. 2.

1.3 Machine Learning and Deep Learning

Machine Learning is a subset of Artificial Intelligence that “explores the study and construction of algorithms that can learn from and make predictions on data”.³⁵ This branch of computer science gives to machines the ability of identifying patterns, based on the training data; the machine, autonomously, applies these patterns to new and unknown data set in order to make predictions and decisions, without being explicitly programmed.³⁶

Voice recognition features and speech transcription found in smartphones are examples of Machine Learning.

Traditionally, ML has two main methods, Supervised learning and Unsupervised learning, alongside two other more recent methods, Semi-supervised learning and Reinforcement learning.

- Supervised learning: in this method the algorithm receives a series of inputs with the corresponding correct output. In this way, the algorithm can learn the relationship between the input and the correct output. Then a pattern is made that can be applied to unknown data set.³⁷

Most of the ML applications that we can find today belongs to this category, especially for classification task and predictions of future

³⁵ Ongsulee (2017), p. 2.

³⁶ Cf. Aggarwal et al. (2022) p. 117.

³⁷ Cf. Chahal/Gulia (2019) p. 4912.

events.³⁸ For example, companies can use these algorithms to predict the sentiment of a piece of text to determine negative comments made by costumers.

- Unsupervised learning: the algorithm receives as input a set of unlabeled data and it must figure out alone patterns and models to classify data.³⁹ The goal is usually to analyze large amounts of data to find similar structures.

In marketing, these algorithms are largely used for segmentation, targeting and personalization of marketing campaigns.

- Semi-supervised learning: is a combination of the two previous methods. The algorithm receives a small amount of labeled data and a large amount of unlabeled data.⁴⁰

Semi-supervised learning is typical of recommendation systems that use information from the preferences that users express on the web.

- Reinforcement learning: learning is based on a mechanism of feedback, that are positive when the algorithm achieves the goal or negative when it makes a mistake.⁴¹

³⁸ Cf. Chahal/Gulia (2019) p. 4912.

³⁹ Cf. Aggarwal et al. (2022) p. 118.

⁴⁰ Cf. Oongsulee (2017), p. 3.

⁴¹ Cf. Chahal/Gulia (2019) p. 4912.

This mechanism can be very useful in digital marketing when it comes to advertising. Based on customer interaction, the algorithm can create more effective adv campaigns.

Deep Learning is a subset of Machine Learning that uses artificial neural networks to recreate the functioning of human brain. Artificial neural networks consist of a series of algorithms that play the role of neurons in biological networks,⁴² analyzing big amount of raw data to extract information and features. More specifically, the learning process goes through a series of layers with a “cascade” logic: “each layer uses the output of the previous layer as input”.⁴³

There are two main types of artificial neural networks: convolutional neural networks (CNN) and recurrent neural networks (RNN).⁴⁴

Deep Learning algorithms have many applications, but they play a very important role in Natural Language Processing (NLP) and Computer Vision (CV).

NLP is a branch of AI that aims to comprehend, interpret and generate human language.⁴⁵ NLP is the backbone of chatbots, virtual assistants (that companies use for customer care), translators (like *Google Translate*), and sentiment analysis, to understand the impressions of customer on a product or a service.⁴⁶

⁴² Cf. Aggarwal et al. (2022) p. 119.

⁴³ Ongsulee (2017), p. 3.

⁴⁴ Cf. Aggarwal et al. (2022) p. 119.

⁴⁵ Cf. Priya et al. (2021) p. 598.

⁴⁶ Cf. Priya et al. (2021) p.p. 601-602.

Computer Vision is a field of AI that aims to derive information from images, videos, and other inputs. In digital marketing activities, Computer Vision can be very helpful, especially in the analysis of user-generated content (UCG) to gain meaningful insights on customers, products, brand and more.⁴⁷

1.4 Generative Artificial Intelligence: historical evolution and main models

The growing interest in Artificial Intelligence in the last few years is mainly attributed to the introduction of ChatGPT, DALL-E and other models belonging to Generative Artificial Intelligence.⁴⁸

Generative Artificial Intelligence is a branch of Artificial Intelligence that includes systems capable of generating seemingly new contents (such as images, text, code, biological elements, videos...).⁴⁹

The evolution of GenAI starts around the 1950s; in this period Hidden Markov models and Gaussian Mixture models were developed. These models generate sequential data such as speech and time series.

⁴⁷ Cf. Nanne et al. (2020) p.p. 158. f.

⁴⁸ Cf. Cao et al. (2023) p.1.

⁴⁹ Cf. Kshetri et al. (2024) p. 1.

However, the turning point in GenAI evolution was the implementation of Deep Learning models that significantly enhanced the performance.⁵⁰

In Natural Language Processing, text generation that previously occurred with N-gram language modeling, which is ineffectively with long sentences, was implemented with recurrent neural networks, marking a significant improvement.

A similar process occurred in Computer Vision: the limitations of texture synthesis and texture mapping for image generation were overcome with Generative Adversarial Networks (GANs) and Variational Autoencoders (VAEs).⁵¹

Another big step in GenAI evolutionary process was the introduction of transformer architecture in 2017.⁵² The transformer architecture is based on a self-attention mechanism that weights the different part of the input data differently, rather than follow a specific sequence.⁵³

For example, if the input data is a sentence, RNN needs to process one word at a time while the transformer architecture can process the whole sentence simultaneously.⁵⁴

⁵⁰ Cf. Mariani/Dwivedi (2024) p. 3.

⁵¹ Cf. Cao et al. (2023) p. 4.

⁵² Cf. Vaswani et al. (2017).

⁵³ Cf. Cao et al. (2023) p. 4.

⁵⁴ Cf. ChatGPT (2024), n.d. (online).

The transformer is largely used in many NLP and CV models, as GPT, BERT and others.

Beside the improvement that this architecture brought to individual models, it also enabled models from different domain to be fused to deal with multimodal tasks.⁵⁵

In other words, it permits the creation of model that can process different types of data both as input and output, like text, images, videos and so on.

Generative Artificial Intelligence models can be divided in two categories: unimodal models and multimodal models.

Unimodal models are designed to process a single modality of raw data, meaning they accept a specific raw data modality, such as text or images, and they generate an output in the same modality.⁵⁶

Multimodal models can process different types of data as input and generate results in different modalities.⁵⁷

The main models belonging to these categories are: Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), Transformers and Generative Diffusion Model (GDM).⁵⁸

The architecture of GANs models is composed of two elements: a generator and a discriminator; the generator generates data as realistic as possible based on

⁵⁵ Cf. Mariani/Dwivedi (2024) p. 3.

⁵⁶ Cf. Cao et al. (2023) p. 8.

⁵⁷ Cf. Hariri (2023) p. 3.

⁵⁸ Cf. IBM (2024) n.d. (online).

training data while the discriminator tries to discriminate between real data and data created by the generator. The objective of the generator, that also learns from the output of the discriminator, is to make images that look real to the discriminator.⁵⁹

An example of this model is GauGAN by NVIDIA, a tool to turn drawings into photorealistic pictures.

VAEs models architecture, also, is composed of two elements: the encoder and the decoder. The former encodes data into parameters while the latter tries to recreate the content based on those parameters. VAEs models are used, especially, for anomaly detection and text-generation.⁶⁰

GDMs models work by a process of progressively corrupting data adding noise and then learning how to reconstruct the content by denoising it for sample generation.⁶¹ These models are usually very efficient as media editing tool and high-quality image generation. An example is DALL-E, by OpenAI.

Finally, Transformer models are based on the transformer architecture which was previously explained. These models, like ChatGPT and BERT, excel at Natural Language Processing.⁶²

⁵⁹ Cf. Liu et al. (2023) p. 799.

⁶⁰ Cf. IBM (2024) n.d. (online).

⁶¹ Cf. Cao et al. (2023) p. 12.

⁶² Cf. IBM (2024) n.d. (online).

1.5 The evolution of digital marketing and the role of social media

Digital marketing refers to marketing activities carried out through online channels and digital tools. Even if a definition is necessary to delimit the boundaries of the matter under consideration, it should be noted that the classic distinction between “digital marketing” and “traditional marketing” no longer exists.⁶³ The creation of online marketing strategies is itself “marketing” just as traditional techniques represent a fundamental knowledge base for digital success. The distinction is even more subtle in the eyes of consumers accustomed to switching between the real world and the online one repeatedly.⁶⁴

The birth of digital marketing coincides with the spread of the web and information and communication technologies (ICT).⁶⁵ The diffusion and evolution of these technologies have created digital spaces where users carry out various activities that previously only took place in the real world. The presence of current and/or potential customers in these spaces has pushed many companies to intercept these customers with messages conveyed through digital channels and with real marketing activities. In the first phase of development, the level of

⁶³ Cf. Gregori/Pascucci (2019) p. 9.

⁶⁴ Cf. Kannan/Li (2017) p. 26.

⁶⁵ Cf. Gregori/Pascucci (2019) p. 16.

complexity of digital marketing was quite low: a company that posted photos on its social networks and had its own website could be considered innovative.⁶⁶

However, the fast evolution of the digital world and related technologies have brought a series of challenges to face, such as: growing numbers of competitors, customer empowerment⁶⁷, low level of attention (especially to company content), media proliferation, information overload...⁶⁸

The consequence is an increase in complexity in the online scenario which requires a strategic approach to digital marketing.

The strategic approach that appears most effective to date is the one that places the customer at the center⁶⁹ and aims to create a memorable customer experience. Optimizing the customer experience requires a deep knowledge of all the customer's features, like needs, desires, purchasing behavior, fears, preferences and many more.⁷⁰ Little by little, the traditional segmentation process is enhanced by the buyer persona tool, a realistic identikit of a typical customer that contains

⁶⁶ Cf. Gregori/Pascucci (2019) p. 56.

⁶⁷ "Customer empowerment" refers to a new perspective in which customer is no longer passive but his "power" towards companies grew thanks to a reduction in information asymmetry. This phenomenon comes from the diffusion of internet that has made it easier to access information on companies, products, and prices, has brought a greater variety of it and has multiplied the opportunities for consumers to come together (Gregori & Pascucci, 2019).

⁶⁸ Cf. Gregori/Pascucci (2019) p. 56.

⁶⁹ Cf. Pascucci et al. (2023) p. 30.

⁷⁰ Cf. Camilleri (2021) p. 53.

all its main characteristics. Companies use buyer personas to make a tailored digital marketing strategy by leveraging key features.⁷¹

Once the target is defined, the next step is designing the “customer journey”. This theory is based on the idea that the customer goes through a “journey” before, during and after the purchase. This journey is composed by a series of stages in which the customer gets in touch with the company,⁷² to ask for information, dispel doubts, make comparisons, pay and so on. Each one of these stages is called “touchpoint” and represents crucial moments for the customer journey because every touchpoint is a little part of the experience.⁷³ Companies must identify all these touchpoints and analyze the best way to satisfy customers in every stage, providing the right information, answering questions and, more in general, meeting their expectations.⁷⁴

Furthermore, it is important to remember that the touchpoints should not be considered separately: the customer usually switches from one channel to another and expects consistency across all touchpoints. For the companies, this means creating an “omnichannel” experience, in which every touchpoint/channel shares data and information with others,⁷⁵ to create a smooth and seamless experience.

⁷¹ Cf. Gregori/Pascucci (2019) p. 75-76.

⁷² Cf. Lemon/Verhoef (2016) p. 74. f.

⁷³ Cf. Gregori/Pascucci (2019) p. 57.

⁷⁴ Cf. Lemon/Verhoef (2016) p. 76.

⁷⁵ Cf. Gregori/Pascucci (2019) p. 57-58.

The proliferation of touchpoints (online and offline) and the importance given to customer experience make the omnichannel approach fundamental for the creation of value.⁷⁶

Social media are one of the most important touchpoints for a company. According to *We Are Social*, in 2023, the number of social media users was 4,76 billion, around 60% of the world population.⁷⁷ Only from this data it is clear that the role of these digital spaces has grown during the last years and, nowadays, they represent a very important touchpoint in the customer journey.

As for every touchpoint, the use of social media must be part of the broader digital marketing strategy; this means that every social media activity must start from objectives and target definition. Once the latter have been defined, companies should choose the logic⁷⁸ to use social media. The choice about platforms and the creation of contents should take place only after these steps.⁷⁹

To better define all these elements, it is helpful to remind that the role of social media as a touchpoint varies depending on where the consumer is along the customer journey. Social media could be the starting point of a purchasing

⁷⁶ Cf. Lemon/Verhoef (2016) p. 83.

⁷⁷ Cf. Starri (2023) n. d. (online).

⁷⁸ There are two main logics: the traditional one, in which social media are used as a vehicle for advertising, and the participative one, in which social media are used as a channel to interact with users increasing customer engagement (Gregori & Pascucci, 2019).

⁷⁹ Cf. Piñeiro-Otero/Martínez-Rolán (2016) p.p. 50-51.

process, when a customer discovers a product through it, could be a touchpoint of information research and even a useful touchpoint after the purchasing for customer care and after-sales service.⁸⁰ Understanding the role of social media in the customer journey is fundamental to define the social media strategy.

⁸⁰ Cf. Gregori/Pascucci (2019) p. 169.

CHAPTER 2 – HOW ARTIFICIAL INTELLIGENCE AFFECTS DIGITAL MARKETING AND SOCIAL MEDIA MANAGEMENT

2.1 The relationship between digital marketing and Artificial Intelligence

In the current digital marketing scenario data are increasingly playing a very important role. The ability of a company to collect, analyze and use data for marketing purposes is a game changer, allowing the company to obtain a competitive advantage.⁸¹

The diffusion of a growing number of digital technologies has changed the way companies operate. Internet of Things (IoT) as well as digital spaces, like website, social media and mobile devices produce a large amount of data everyday.⁸² Moreover, people live in a digital world and every little step they make inside this world leaves a trace, like personal information, preferences, needs, desires, geographical location and many more.

⁸¹ Cf. Gregori/Pascucci (2019) p. 230.

⁸² Cf. Cavlak/Cop (2021) p. 17.

The proliferation of information leads to the concept of “Big data”. Big data can be defined as large amounts of data that provide meaningful information with the help of digital technologies.⁸³ Big Data have five main characteristics:

- Variety: it refers to the heterogeneity of data. Data can be structured, unstructured or semi-structured, depending on their format.
- Velocity: it refers to the continuity of data creation speed, which, nowadays, is high.
- Volume: as the term “Big Data” suggests, the size of the data aggregate is massive.
- Veracity: it refers to the quality of data.
- Value: it refers to the possibility of generating value with data.⁸⁴

The analysis of Big Data offers valuable insights and feedback allowing optimization of various processes like marketing activities, sales, logistics and strategy development. Adopting a data-driven approach in decision-making processes provides managers with a greater understanding of the company's performance and allows the creation of sustainable and long-lasting value.⁸⁵

The integration of Big Data analytics in digital marketing offers new possibilities to create stronger customer-relationships, personalization, real-time interactions,

⁸³ Cf. Cavlak/Cop (2021) p. 19.

⁸⁴ Cf. Gregori/Pascucci (2019) p. 232.

⁸⁵ Cf. Cavlak/Cop (2021) p. 17.

and performances optimization.⁸⁶ This modern approach in which data is considered as “the new oil”⁸⁷ led to the concept of data-driven marketing which is the process of gathering and using data to inform marketing decisions and personalize the customer experience in real-time.⁸⁸ The fulcrum of this new approach lies in the possibility of expanding knowledge about customers through monitoring the digital environment. Social media interactions, activities on websites and blogs, sensors, cookies, real-time locations, and smart devices are all potential sources of data that companies need to monitor to gain detailed insights about their customers. Furthermore, through sentiment analysis on review sites and social media conversations companies can understand customers’ opinions on products, brand, and companies.⁸⁹

Marketers can monitor these data to understand consumer behavior, intent, demands and expectation; in this way, they can create more efficient and effective (digital) marketing campaigns, improving customer experience. The analysis of information about every aspect of costumer helps companies to notice elements of consumer behavior that remained in the dark.⁹⁰ In particular, they try to uncover consumers’ cognitive behavior leveraging frailties and other key aspects.

⁸⁶ Cf. Mukhopadhyay et al. (2024) p. 3.

⁸⁷ Cf. Palmer (2006) n.d. (online).

⁸⁸ Cf. Pascucci et al. (2023) p. 31.

⁸⁹ Cf. Camilleri (2021) p. 52.

⁹⁰ Cf. Cavlak/Cop (2021) p. 24.

Moreover, marketers may use insights to evaluate the evolution of consumer behavior, noticing changes and the possible correlation with changes in sales over time.⁹¹

The detailed and broad image of the customer that arises from this process is exploited by businesses to personalize products and services, identify more profitable customers, optimize marketing decisions, allocate resources on different customers, customize messages and contents, improve customer relationship management, and personalize every aspect of customer experience.⁹²

The process doesn't stop here: data are also fundamental to analyze the result of a particular campaign, evaluating the performance and taking corrective actions where necessary. Based on the objectives and the specific features of each tool/activity, marketers should gather the data that is most representative for a correct assessment. In this way data allows the creation of a series of improvement cycles based on an "action-correction" logic, with positive impact in the medium-long term.⁹³

Cavlak and Cop provide some great examples of Big Data implementation in digital environment:

⁹¹ Cf. Camilleri (2021) p.p. 52-53.

⁹² Cf. Cavlak/Cop (2021) p.p. 18. f.

⁹³ Cf. Piñeiro-Otero/Martínez-Rolán (2016) p. 46.

- Amazon analyzes order history, product search history and shopping cart records to predict online orders and develop new marketing strategies accordingly.
- Fresh Direct, a company that deals with online grocery delivery, bases its daily pricing and sales strategy on the flow of data that comes from its website and other online activities.
- Ford Motor, PepsiCo and Southwest Airlines have implemented sentiment analysis to evaluate the opinions shared on social media by their customers.⁹⁴

Data represent the link between Artificial Intelligence and digital marketing. The application of AI technology to digital marketing is mainly due to the ability of Artificial Intelligence to process data. ML algorithms, in fact, are able to collect data from multiple sources, in different formats and in large quantities and then process them correctly and quickly, satisfying the information need better than any person.⁹⁵

In other words, AI helps businesses facing some of the challenges associated with adopting Big Data in a data-driven strategy. First, it alleviates the difficulty of a company to handle large amounts of data and the risk of information overload by leveraging ML algorithms capable of processing vast volumes of data. Second,

⁹⁴ Cf. Cavlak/Cop (2021) p.p. 25-26.

⁹⁵ Cf. Verma et al. (2021) p. 2.

the need for data science skills is overcome (at least partially) as the skills are incorporated into the algorithm. Finally, AI models operate in the limits of economic convenience without increasing costs and providing efficiency.

Data analysis through Artificial Intelligence systems can enhance existing digital marketing techniques but can also generate new ways of creating and distributing value. Companies can understand the entire customer journey,⁹⁶ focusing on the critical points where the purchasing process can possibly stop.⁹⁷ Furthermore, they can carry out more accurate market research, gaining key information on different targets, or even on individual customer, in order to personalize products or services or communication campaigns, making them more effective. AI-powered chatbots and virtual assistants support customers during their purchasing journey, enhancing customer experience.⁹⁸ Deep Learning algorithms can help marketers with advertising, targeting the right group of customers for a higher chance of conversion.⁹⁹ Thanks to predictive analysis based on historical data, Machine Learning can help businesses find the most valuable customers to address them meaningful recommendations.¹⁰⁰ Generative models, supported by a deep

⁹⁶ Cf. Haleem et al. (2022) p. 120.

⁹⁷ Cf. Lemon/Verhoef (2016) p. 76.

⁹⁸ Cf. Apriani et al. (2024) p.p. 320-321.

⁹⁹ Cf. Haleem et al. (2022) p. 121.

¹⁰⁰ Cf. Haleem et al. (2022) p. 122.

comprehension of customer preferences, can enhance content marketing, generating more personalized content for each platform.¹⁰¹

From the intersection between digital marketing and Artificial Intelligence we can also understand the future trend of marketing. The greater importance given to data to comprehend the customer leads to the so-called phenomenon of “hyper-personalization”. This technique goes beyond the simple customization based on demographic data, concerning the personalization of the company offer up to the individual customer level.¹⁰²

This marketing approach, called “customer-centric”, aims at creating the stronger and long-lasting relationships with customer, creating the best possible experience.

The need for personalization is the result of some changes occurred in the competitive environment. In particular, the “new” customer¹⁰³ that emerges from digitalization expects a personal relationship with companies. Furthermore, a tailored experience makes it easier for consumer to choose among products, and brand they prefer.¹⁰⁴

Some of the biggest companies have already adopted this approach with clear advantages: for examples, Amazon’s mission is becoming the most customer-

¹⁰¹ Cf. Kshetri et al. (2024) p. 2.

¹⁰² Cf. Deloitte (n.d.) p. 8. (online).

¹⁰³ Cf. Gregori/Pascucci (2019) p.p. 34. f.

¹⁰⁴ Cf. Deloitte (n.d.) p. 15. (online).

centric company in the world; they pursue this objective by using ML models to detect the most relevant elements for customers.¹⁰⁵ Aeon Co. Ltd, Asia's largest retailer, is pursuing a digital-first strategy with the goal of providing the right content to the right customer at the right time. For this purpose, the company has also implemented Artificial Intelligence that helps with web monitoring and predictions.¹⁰⁶ Starbucks creates a unique in-app customer experience with the use of AI-empowered tools to send personalized messages and offers for each specific customer.¹⁰⁷

These practical examples show that the new marketing is not oriented to Artificial Intelligence but to customers; AI is just a means to reach the customer more precisely and effectively mixing the strengths of this discipline with digital marketing techniques.

The new paradigm that emerges from this merger is that of "Artificial Intelligence marketing". AI Marketing refers to a form of marketing that uses Artificial Intelligence concepts and models to make automated marketing decisions based on data collection and data analysis.¹⁰⁸ Since the consumer is the center of marketing activities, AI marketing focuses on responding quickly to their needs. The ability of AI systems to make real-time and data-driven decisions represents a

¹⁰⁵ Cf. Slater n.d. (online).

¹⁰⁶ Cf. KPMG (2016) p. 24. (online).

¹⁰⁷ Cf. Deloitte (n.d.) p. 13. (online).

¹⁰⁸ Cf. Flinders (2023) n.d. (online).

game changer in (digital) marketing and the most important strength of this technique.¹⁰⁹

Following the framework proposed by Kumar et al. (2024), the AI-driven marketing capabilities can be grouped in three categories:

- Analytical marketing capabilities: refers to the ability of ML-powered tools to gather data from different sources, collect them in databases and analyze these large datasets to gain valuable insights or to evaluate the performance of a marketing campaign. Some examples of these capabilities include predictive analysis from AI-enhanced CRM, customer segmentation and real-time performance tracking.
- Technological marketing capabilities: refers to the incorporation of AI platforms and tools in marketing processes to empower them. Some examples include the use of chatbots and virtual assistants and programmatic advertising.
- Strategic efficiency capabilities: refers to AI applications that make marketing process more responsive to market dynamics and changes in customer preferences. Following market trends, these initiatives enhance customer experience. An example of these capabilities is real-time assistance¹¹⁰

¹⁰⁹ Cf. Haleem et al. (2022) p.p. 127-128.

¹¹⁰ Cf. Kumar et al. (2024) p.p. 5. f.

A more detailed analysis of the applications of AI to digital marketing will be addressed in chapter 3.

2.2 The impact of Artificial Intelligence on digital marketing and business

Before analyzing the applications of AI to digital marketing it is necessary to evaluate the impact that this technology has on the discipline and on the business in general. In this way it is possible to better understand the benefits of the AI-marketing combination as well as the relevance of the topic in the current and future scenario.

Beyond the individual tools that AI can empower (and which will, in any case, be dealt with in the following chapter), the main benefits of AI for marketing activities can be grouped into two categories: greater efficiency and greater effectiveness.

- Greater efficiency: in this category there are all the interventions that improve the relation between input and output, both at the level of individual processes and entire marketing campaigns.

AI is very helpful in saving time in every process, facilitating decision-making processes through the analysis of data and eliminating personal variables like sentiment, opinions, biases, and individual interests.¹¹¹

Also, it allows the automation of some processes and techniques, such as, for example, e-mail marketing, analytics, and pay-per-click advertising, revitalizing the theory of *Marketing Automation*.¹¹² The automation of processes, not only provides better results, but also frees up time for strategic work¹¹³ especially when the automation regards repetitive tasks.

Moreover, AI implementation reduces rate error: machines usually follow the same scheme for each task, eliminating human interactions that can affect the result.¹¹⁴ However, this technology does not replace employees but increases the quality of their work.¹¹⁵

Thanks to data analysis, AI promotes optimal resource allocation¹¹⁶ across customers, channels, processes, and marketing objectives.

¹¹¹ Cf. Boddu et al. (2022) p. 2290.

¹¹² Marketing Automation refers to the use of software to automate marketing activities. The automation is implemented not only to foster efficiency but also to provide a more personalized experience to customers (Gregori & Pascucci, 2019).

¹¹³ Cf. Kumar et al. (2024) p. 9.

¹¹⁴ Cf. Boddu et al. (2022) p. 2290.

¹¹⁵ Cf. Davenport et al. (2020) p. 27.

¹¹⁶ Apriani et al. (2024) p. 324.

Finally, AI brings a generalized cost reduction due to automation and optimization of digital marketing activities.¹¹⁷

- Greater effectiveness: in this category there are all the AI implementations that lead to a greater achievement of marketing goal.

AI marketing uses real-time decisions, based on data, to react quickly to consumer desire in a particular stage of the customer journey. This technique is specifically effective online: modifying some elements (like messages, price, visual content...) according to the digital traces left by users leads to a greater conversion rate.¹¹⁸

The strengthening of lead-generation techniques allows for an expansion of the customer base and, consequently, a higher probability of more sales.¹¹⁹

AI speeds up A/B Testing,¹²⁰ very useful in digital marketing for e-mail, website components, content creation, advertising, landing page and many more. In this way is possible to recognize faster the best option, according to the chosen key performance indicators (KPIs), improving effectiveness.

¹¹⁷ Cf. Davenport et al. (2020) p. 27.

¹¹⁸ Cf. Kumar et al. (2024) p.p. 8-9.

¹¹⁹ Cf. Boddu et al. (2022) p. 2291.

¹²⁰ Apriani et al. (2024) p. 322.

The use of AI can have a positive effect on the positioning of the company in the consumer's mind: NLP tools can be used to develop attractive slogans to emphasize customer perceptions.¹²¹

Finally, AI can provide predictions of future trends and situations. Based on historical data, ML algorithms can understand valuable patterns. These patterns have a double utility for a company: they can be applied to customers, to identify prospects with a higher chance of conversion or to find the best way to approach a particular segment, or they can be exploited for strategically plan marketing actions or sales operations.¹²²

The previous two categories should not be considered as separated, but as two sides of the same coin; any improvement in efficiency is instrumental in achieving greater effectiveness and vice versa.

Shifting attention to marketing objectives, the main benefit of AI marketing concerns the optimization of the purchasing experience for the customer. As already seen in subchapter 2.1 (to which reference is made), the enhancement of the experience passes through the exploitation of data to understand the customer, personalize content and offer, and provide a pleasant customer journey. This process can be considered as a cause of the benefits seen above: greater customer satisfaction and loyalty allow an optimization of processes and a saving of

¹²¹ Cf. Ming-Hui/Rust (2021) p. 38.

¹²² Cf. Kumar et al. (2024) p.p. 6-7.

resources for marketing activities as well as guaranteeing the achievement of marketing objectives.

McKinsey & Company estimated the effects of AI marketing's benefits: the use of AI models generates an increase in productivity of the marketing function with a value between 5 and 15 percent of total marketing spending; moreover, sales productivity could increase by 3-5 percent.¹²³ This is the reason why the market for AI in marketing is expected to be worth \$107.5 billion by 2028.¹²⁴

The positive impact of Artificial Intelligence on digital marketing is not relegated only to marketing objectives but its benefits spread throughout the entire company and its economic-financial situation. The improvements in resources allocations, the speeding-up of decision-making processes together with a greater understanding of customer and customer journey have a significant impact on revenues and other indicators.

According to research conducted by McKinsey & Company "players that invest in AI are seeing a revenue uplift of 3 to 15 percent and a sales ROI uplift of 10 to 20 percent."¹²⁵ Moreover, the consultancy firm estimates that Generative AI could increase corporate profits by \$2,6 to \$4,4 trillion a year. Accenture discovered a similar positive correlation between AI implementation and financial indicators,

¹²³ Cf. McKinsey & Company (2023) n.d. (online).

¹²⁴ Cf. Kshetri et al. (2024) p. 1.

¹²⁵ Deveau et al. (2023) n.d. (online).

with an increase of 35 percent on Enterprise Value/Revenue Ratio, 33 percent on Price/Earnings Ratio and 28 percent on Price/Sales Ratio.¹²⁶

Much of this value comes from growth in productivity that Artificial Intelligence could generate; the estimate is for an annual increase between 0,1% and 0,6%; in combination with other technologies, productivity could grow by 0,5 to 3,4 percent annually. The fact that AI could be used for repetitive tasks, freeing up time to dedicate to activities with greater strategic content, plays a fundamental role in this process. In particular, the research shows that the number of hours that could theoretically be automated is around 60-70 percent of total hours worked.¹²⁷

Even if the implementation of Artificial Intelligence in companies is still in a preliminary phase, many managers give great importance to this topic. Different surveys show the level of adoption and the interest of managers regarding AI in their business. The Conference Board survey stated that 87% of marketers and 85% of communicators have used AI or experimented with AI tools for at least one application. Moreover, 82% of respondents believe that AI will improve productivity while only 4% expect productivity to decrease.¹²⁸ According to a survey conducted by McKinsey & Company, 90% of commercial leaders think that their organization should be using Machine Learning or GenAI “often” over

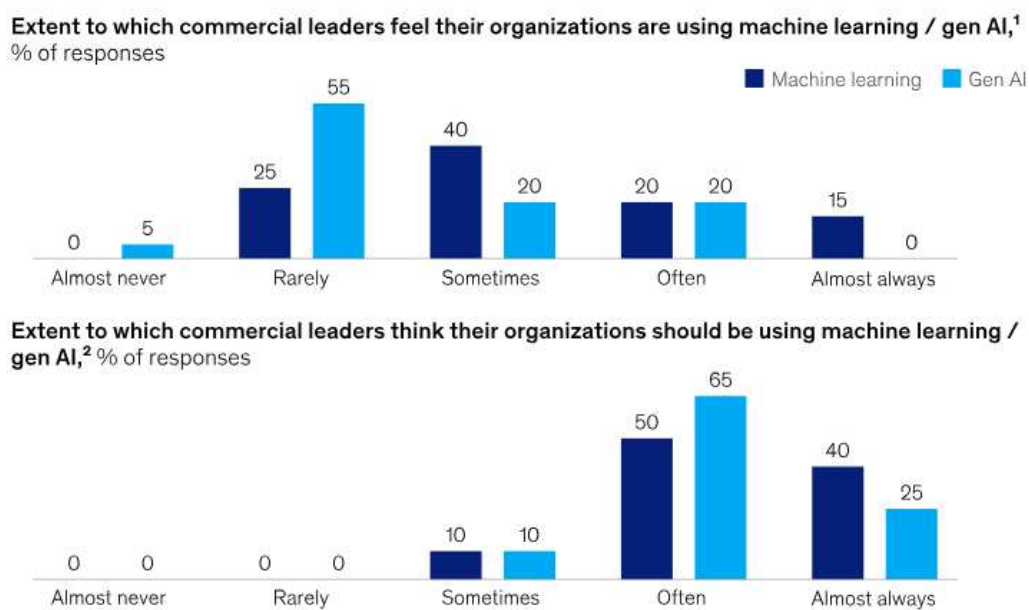
¹²⁶ Cf. Reilly et al. (2019) p. 5.

¹²⁷ Cf. McKinsey & Company (2023) n.d. (online).

¹²⁸ Cf. The Conference Board (2023) n.d. (online).

the next two years (fig. 3).¹²⁹ Accenture, also, conducted a survey to understand the opinion of managers regarding the use of AI. According to results, 84% of business executives believes they need to use AI to achieve their growth objectives, and three out of four managers believe that if they don't scale AI, they will put their business at risk.¹³⁰

Fig. 3- COMMERCIAL LEADERS' OPINION ON AI



Source: McKinsey & Company - AI-powered marketing and sales reach new heights with generative AI.

¹²⁹ Cf. Deveau et al. (2023) n.d. (online).

¹³⁰ Cf. Reilly et al. (2019) p. 3.

2.3 The relationship between Generative AI and social media

In the digital marketing scenario contents represent the central element of a company's online presence.¹³¹ Content creation helps companies creating a narrative about brand and products, with the function of informing and educating consumers on certain topics and entertaining them.¹³²

Moreover, customers require useful information to aid them during the purchasing journey; companies can provide contents to satisfy their need and meet their expectations. From this assumption it follows that contents are the means through which companies come into contact with their customers at the different touchpoints along the customer journey. Therefore, the relevance of content creation in enhancing customer experience increased significantly. Nowadays, people spend a lot of time in the digital environment, looking for high-value and updated content, such as images, videos, articles and many more. Furthermore, they want this experience to be as personalized as possible. Following the customer-centric approach, companies should satisfy their needs providing content richer in information and highly personalized.¹³³

¹³¹ Cf. Gregori/Pascucci (2019) p. 86.

¹³² Cf. Lou/Xie (2021) p. 2.

¹³³ Cf. Kee/Yazdanifard (2015) p.p. 1056-1057.

The great relevance of this topic leads to the paradigm of “Content Marketing”. Content Marketing can be defined as “the strategic marketing approach of creating and distributing valuable, relevant, and consistent content to attract and acquire a clearly defined audience, with the objective of driving profitable customer actions.”¹³⁴ Three elements emerge from this definition:

- A strategic approach: the creation of contents should be part of a broader strategy and related to specific objectives.
- High quality of content: companies should send messages which add value to the experience.
- A target audience: since digital marketing is customer-oriented, the definition of a target and customization of contents should be a priority.

Content Marketing can be seen as an ongoing socialization between the company and its customers, that improves trust and credibility and aims at convert customers passive behavior into an active one.¹³⁵ Even if Content Marketing shares with advertising the final objective, there are four characteristics that differentiate the two subjects:

- Content Marketing embodies a company's or a brand's sincere commitment to delivering value to customers by providing relevant or free content.

¹³⁴ Content Marketing Institute, n.d. (online).

¹³⁵ Cf. Lou/Xie (2021) p. 2.

- Its objective is to cultivate enduring relationships with consumers, rather than directly urging them to make immediate purchases.
- Content Marketing relies on consumers' initiative to seek out valuable brand content, rather than brands forcefully pushing content onto consumers.
- Lastly, in contrast to "paid" advertising, Content Marketing "earns" its audience by offering content that is rewarding or valuable.

Content Marketing provides different benefits for companies. The first benefit is directly connected to the ultimate goal of Content Marketing: the creation of valuable and relevant contents has a positive impact on sales.¹³⁶ However, there are more benefits that arise from this marketing technique that push companies to adopt this strategy. Meaningful and personalized contents help companies to emerge among competitors; moreover, the personalization of messages makes customers feel respected as individuals increasing their loyalty towards the brand. When a customer is loyal to a brand, not only becomes more receptive to messages but is also more inclined to recommend the company's products to other individuals generating an expansion in customer base.¹³⁷ The development of a narrative is functional to a better positioning of the products in the customer's

¹³⁶ Cf. Lou/Xie (2021) p. 2.

¹³⁷ Cf. Kee/Yazdanifard (2015) p.p. 1057. f.

mind as well as to the brand-building activity.¹³⁸ In fact, contents increase trust and credibility towards company and improve brand awareness and perceptions. Ultimately, we can affirm that Content Marketing allows for an enhancement of the customer experience, through personalization and distribution of value.

Social media are the most used channel by companies to deliver their contents and relate to their customers. The reasons for this are multiples. First, it is the very nature of social media that requires the creation of content in order to "be present" on the various platforms. Second, it was already discussed the importance of social media in today's digital scenario with billions of people using them every day (see chapter 1.6.). However, the main reason that pushes companies to use social media as the fulcrum of their Content Marketing strategy lies in the interactivity that social media guarantee.¹³⁹ Interactivity is the main characteristic of social media and it refers to the possibility of communicating, "meeting", sharing ideas, conversing, and interacting (precisely) in these platforms. With the diffusion of social media business environment has become more dynamic allowing customers to engage with organizations personally and in real-time.¹⁴⁰ The interaction between companies and customers on social media occurs through content. This interaction is satisfying for consumers when it's interesting and

¹³⁸ Cf. Lou/Xie (2021) p. 2.

¹³⁹ Cf. Gregori/Pascucci (2019) p.p. 171-172.

¹⁴⁰ Cf. Dolan et al. (2019) p. 2214.

funny.¹⁴¹ Therefore, the creation of valuable contents becomes crucial to improve the interaction with customers on social media. Meaningful interactions result in higher levels of customer engagement and strengthening of the bond with them. Ultimately, today social media represents the center of Content Marketing activities thanks to their ability to foster the engagement of consumers.

Customer engagement is a multi-dimensional concept that describes the psychological journey of customer towards brand loyalty,¹⁴² and which occurs in the context of interactive and co-creative experiences.¹⁴³

The three dimensions of customer engagement are:

- Behavioral: it refers to the behaviors that engagement produces in consumers, like actions and interactions.
- Cognitive: it refers to the mental state of continuous attention towards the brand and depends on the value of the contents conveyed by the company.
- Emotional: it refers to the emotional bond resulting from the emotions aroused by the relationship.¹⁴⁴

The degree of engagement varies on a spectrum that goes from low levels of engagement, associated with a passive behavior, through moderate active levels of engagement and up to high levels of engagement. Each of these levels is

¹⁴¹ Cf. Gregori/Pascucci (2019) p. 172.

¹⁴² Cf. Dolan et al. (2019) p. 2214.

¹⁴³ Cf. Brodie et al. (2011) p. 260.

¹⁴⁴ Cf. Gregori/Pascucci (2019) p. 175.

associated with behavioral responses which, in order, are: consuming (viewing brand-related video, listening to brand-related audio...), contributing (rating products and/or brands, “liking” and “sharing” brand-related content...) and creating (commenting positively on posts, blogs, videos and pictures, uploading brand-related video, audio, pictures or images...).¹⁴⁵

Brand community represents an example of meaningful interactions between a brand and its customers through social media with high level of engagement. A brand community is a “virtual community based on a structured set of social relationships among the consumers of a brand.”¹⁴⁶ Inside this community users can exchange information, share experiences, and generate knowledge about a shared passion. In this way customers become content creators rather than just consumers.

Brand communities provide a sense of membership among users, knowledge gains and meaningful interactions; the consequence is a high level of engagement and a growing loyalty to brand.¹⁴⁷

When creating the social media marketing strategy, it is therefore necessary to adopt the appropriate solutions for the development of engagement. In particular, the creation of valuable contents is fundamental to generate the behavioral,

¹⁴⁵ Cf. Dolan et al. (2019) p.p. 2216-2217.

¹⁴⁶ Huang et al. (2018) p. 2131.

¹⁴⁷ Cf. Huang et al. (2018) p.p. 2132-2133.

cognitive, and emotional responses.¹⁴⁸ In this regard, the study by Dolan et al. (2019) has shown that rational contents have a greater impact in generating social media engagement behavior (SMEB) than emotional ones; in particular, informative contents, with product- and brand-related information, drive more active SMEB than remunerative contents (sales-focused content). Emotional contents, such as entertaining and relational posts, produce more passive SMEB, especially in the form of consuming.¹⁴⁹

Content creation represents the connection between Generative Artificial Intelligence and social media management. Generative AI is likely to augment and transform content creation in several ways. This is mainly attributed to the ability of GAI models to generate human-like and customized contents, replacing or supporting experts in the creation of high-quality content.¹⁵⁰

The diffusion of GANs models and GDMs models allows the creation of high-quality visual contents, like images or videos. For instance, marketers can produce realistic representations of products to post on social media; high-quality videos can instead be used for product demo videos.¹⁵¹ Both images and videos can be personalized, even in real-time, to make them more relevant for the audience. In this regard, using various consumer characteristics like political beliefs and

¹⁴⁸ Cf. Gregori/Pascucci (2019) p. 178.

¹⁴⁹ Cf. Dolan et al. (2019) p. 2232.

¹⁵⁰ Cf. Wahid et al. (2023) p. 1814.

¹⁵¹ Cf. Kshetri et al. (2024) p. 6.

personality traits, ChatGPT effectively tailored ads to match consumer profiles, leading to a greater impact on consumer behavior compared to non-personalized controls. Advancement in NLP allows marketers to generate very engaging textual contents, such as captions or product descriptions. For example, companies can ask ChatGPT to write an attractive caption for a new Instagram post and ask Mid-Journey to develop a visual content to matches that caption.

More generally, companies can automate the entire content creation process from audience analysis to the actual design of content using GenAI models.¹⁵²

A very important benefit of these models is the possibility of producing personalized contents based on customer data previously collected and analyzed. For example, Salesforce Einstein GPT can conduct research on potential new customers, providing an overview of them and useful insights for personalized recommendations.¹⁵³ GAI algorithms are not only useful tools for market research: these insights can be exploited by these systems to create content tailored on the specific characteristics of customers, marking a substantial step towards hyper-personalization.¹⁵⁴ For a better customer experience, Generative

¹⁵² Cf. Brüns/Meißner (2024) p. 2.

¹⁵³ Cf. Kshetri et al. (2024) p.p. 5-6.

¹⁵⁴ Cf. Brüns/Meißner (2024) p. 2.

Artificial Intelligence can also contextualize the content generating customized messages in real-time with higher chance of conversion.¹⁵⁵

Moreover, the application of Generative Artificial Intelligence to Content Marketing enhances efficiency and optimization. GenAI algorithms can reduce costs and time to produce marketing content. GAI tools can generate highly personalized and relevant content in just a few seconds, with a significant time reduction. Furthermore, content production is scaled,¹⁵⁶ meaning a large amount of material can be produced in a short period of time. There are also positive effects on the variety of contents: the same concept can be represented in different ways by GenAI tools thus providing different options.¹⁵⁷ Consequently, AI improves creativity and idea generation.

Besides the benefits, there are other factors that facilitate the application of GenAI to content creation:

- Ease of use: most of the tools that can be found online, like ChatGPT, DALL-E and Midjourney, has a friendly interface that makes it easy to use them for marketing purpose.
- Trialability: it is possible to try these tools before formally adopting them.

For example, ChatGPT or Stable Diffusion are free-to-use models.

¹⁵⁵ Cf. Bernard (2023) n.d. (online).

¹⁵⁶ Cf. Brüns/Meißner (2024) p. 2.

¹⁵⁷ Cf. Kshetri et al. (2024) p. 6.

- Affordability: even though not all tools are free, usually the cost is not prohibitive even for small-medium enterprises.
- Variety: even if ChatGPT is the most famous and used program, there are many tools that can be implemented in marketing activities. We can think about Jasper.ai, Copy.ai and Peppertype.ai for copy generation, DALL-E2 and Midjourney for image generation, Sandbox AI for advertising on Meta, ChatGPT for text generation and many more.
- Adaptability: it refers to the possibility of training GAI models on specific features of the company, such as products, services, or marketing policies, to better adapt them to company's needs.¹⁵⁸

2.4 How Generative Artificial Intelligence affects customer engagement

There is no doubt that Generative Artificial Intelligence has the power to reshape the way marketers create contents. The benefits of these technologies as well as their facilitating features for adoption constitute elements too significant to be ignored.

¹⁵⁸ Cf. Kshetri et al. (2024) p. 4.

Since Content Marketing through social media is generally associated with greater customer engagement thank to the interactivity of these platforms, it's interesting to understand how GAI tools affect the levels of engagement.

Different studies claim that Generative Artificial Intelligence has, generally speaking, a positive impact on customer engagement. This is mainly attributed to the ability of Generative AI models to create personalized content based on customer preferences and needs. GenAI systems can scrutinize meticulously large data set enabling organizations to have deeper understanding of their target audience; armed with these insights, GAI tools can generate dynamic contents, such as engaging copy or attractive images for social media posts.¹⁵⁹ The content is tailored on the specific preferences of segments, providing more engagement and effectiveness. The application of GAI tools to Content Marketing drives a more personalized, responsive, and user-friendly customer engagement.¹⁶⁰ The customized content fosters a strong sense of customer value and understanding, improving customer satisfaction and positively impacting the relationship with them.¹⁶¹

Additionally, Generative Artificial Intelligence shines in predictive analytics. By examining past data, it can predict future trends and customer behaviors, allowing

¹⁵⁹ Cf. Verma/Kumari (2023) p.p. 4-5.

¹⁶⁰ Cf. Choi/Kim (2024) p. 91.

¹⁶¹ Cf. Verma/Kumari (2023) p. 4.

marketers to understand and cater to changing customer needs and preferences before they arise. With the insights provided by Generative AI, businesses can create content that are both reactive and proactive. This ensures that they can effectively connect with their target audience by anticipating their needs.¹⁶²

In this regard, the research conducted by Choi and Kim (2024) is significant. The two researchers conducted a survey to understand the impact of GAI on customer engagement in B2C contexts, considering different variables like awareness, digital technology adoption and infrastructure. A part of this study focuses on the role of external GAI agility in fostering customer engagement. External GAI agility can be defined as “the capability of an organization to effectively interact with external stakeholders and respond to market changes by leveraging GAI tools”.¹⁶³ This ability allows companies to be aware of customer needs and market trends, aligning their offering (including their content) and personalizing them accordingly.

The research shows that there is a positive correlation between external GAI agility and customer engagement. In other words, the use of Generative Artificial Intelligence systems makes the company more responsive to market dynamics and changes in consumer preferences. This has a positive impact on customer

¹⁶² Cf. Bhattarai (2023) p. 4.

¹⁶³ Choi/Kim (2024) p. 93.

engagement which is strengthened. The result highlights that the use of GAI tools is an important driver of customer engagement and satisfaction.¹⁶⁴

Even if different studies claimed that content creation through Generative AI enhances customer engagement and some companies have already adopted this technology in their process, other researchers have shown that Generative Artificial Intelligence can also have a negative effect.

This is the case of the research conducted by Brüns and Meißner (2024). Through a series of studies, they found that “brands that automate content creation through GenAI are perceived as less authentic than brands that do not use GenAI.”¹⁶⁵ Even though, at first, participants didn’t notice differences between GAI content and human content, when the content was disclosed as AI generated, the perceptions and behavioral responses were negative. The perception of less brand authenticity leads to negative attitudes and behaviors; these include less trust in posts, less positive feelings toward the brand, a decreased likelihood of sharing positive word-of-mouth, and lower brand loyalty.

The link between these two opposite visions is provided by the same research by Brüns and Meißner. In the third part of their study, the two researchers investigate the relation between negative sentiment/behavior and the degree of adoption of AI in content creation. The result shows that the more GenAI replaces the human

¹⁶⁴ Cf. Choi/Kim (2024) p. 100.

¹⁶⁵ Brüns/Meißner (2024) p. 9.

component in the creation of content, the more negative the perceptions and comments are. In other words, if GenAI tools assist humans instead of replacing them, customers have a less negative judgements on brand authenticity and more engagement. The implication for marketers is to implement Generative Artificial Intelligence strategically in the content creation process, assisting professional creators and expanding their capabilities, always monitoring customer reactions and engagement. Also, declaring when a content is the result of collaboration between humans and AI can reduce customer reluctance.¹⁶⁶

The ambiguity of the results of different studies can also be explained considering that the application of GenAI tools to Content Marketing is still in a preliminary phase; some companies, especially big ones, have already adopted these technologies in their activities but the majority of businesses have not started yet this process. As a result, there is not yet sufficient practical evidence to determine the impact of GenAI on customer engagement.

In this regard, Wahid, Mero and Ritala (2023) have identified several variables that may play an important role in the relationship between Generative Artificial Intelligence and customer engagement but whose contribution has not yet been evaluated. These are:

- Type of content: Generative Artificial Intelligence can help with the generation of all types of content; however, it may lack precision in

¹⁶⁶ Cf. Brüns/Meißner (2024) p. 10.

informative content or the necessary human touch in the emotional ones.

On the other hands GenAI tools may create images or videos way more engaging than those created by humans. The relation between type of content generated by GenAI and engagement is one of the main questions for future research on this topic.

- Product type: for products that customers really care about, like high-involvement ones, they tend to seek out lots of information. So, it is important for companies to provide contents that are packed with info. But for low-involvement products, customers are more drawn to visuals and might not pay as much attention to detailed information. Using GAI tools to write captions for the first type of products and to create image for the second may decrease customer engagement while doing the opposite may result in an improvement.
- Customers' age: younger generation may be more receptive than older generation to new technologies and GenAI should be used accordingly.
- Customer's value towards authenticity: some customers may seek for authenticity when buying products, for example preferring human-made products rather than machine-made ones. For this type of customers GenAI content may negatively affect engagement.

- Customers' innovativeness: customers with high innovativeness enjoy consuming new products and technologies and may engage more with AI-generated content than customers with low level of innovativeness.
- Trust, eeriness, and perceived firm innovativeness: trust refers to the level of credibility of a content produced by AI, which could be low if the content presents some imperfections, negatively impacting engagement. Eeriness refers to the sense of discomfort that people can feel in their relationship with the contents created by machines that behave like humans. Engagement may decrease if the sense of unease is high. Finally, customer may perceive a company as innovative if the company use new technologies in its offering. This phenomenon has a positive impact on loyalty and engagement. The role of these variables should not be underestimated in future research.¹⁶⁷

¹⁶⁷ Cf. Wahid et al. (2023) p. 1818.

CHAPTER 3 - ARTIFICIAL INTELLIGENCE

APPLICATIONS TO DIGITAL MARKETING AND USE

CASES

The ability of Artificial Intelligence to process data and automate processes makes this technology very versatile in the field of digital marketing. Digital marketing, in fact, is made up of a series of processes and activities carried out using various techniques and tools in which Artificial Intelligence can bring benefits in terms of effectiveness and efficiency. This chapter analyzes the main applications of AI and its components to digital marketing, starting from more strategic processes up to more operational techniques. Furthermore, to evaluate the practical implications, one or more case studies are also reported for each application, i.e. cases of companies that have implemented AI in daily practice.

3.1 Segmentation and Targeting

The complexity of the online scenario and, in particular, the heterogeneity in consumer preferences and tastes imposes the need for companies to segment the market. Segmentation is the process through which a company can identify groups of customers (“segments”) that are homogeneous in their characteristics.

Homogeneity allows the company to treat each group with the same modalities (that is the same messages, the same products, the same campaigns and so on) customized on the key-features of that group.¹⁶⁸

In this way, companies can simplify the market and focus on the segments they believe most interesting.¹⁶⁹

The traditional market segmentation model involves 4 types of variables: demographic, geographic, psychographic, and behavioral variables. Demographic variables include variables such as age, sex, income, occupation, religion, and educational level. Geographic variables regard country, city, locality, and density. Psychographic variables concern lifestyle, social class, and personality. Behavioral variables consist of benefits sought, usage rate and purchase occasion.¹⁷⁰

The advent of internet has expanded the ability of companies to segment the market. The large amount of data that can be collected on the web allows for more detailed profiling of users, enhancing traditional segmentation criteria with new variables such as loyalty to a website, real-time localization, network access device, attitude towards privacy and many more.¹⁷¹

¹⁶⁸ Cf. Gregori/Pascucci (2019) p. 71.

¹⁶⁹ Cf. Malesević et al. (2014) p. 13461.

¹⁷⁰ Cf. Malesević et al. (2014) p. 13462.

¹⁷¹ Cf. Cavlak/Cop (2021) p.p. 23-24.

This is when AI comes into play, helping in information gathering. AI algorithms can scan websites and blogs searching for relevant information, like product features, customer feedback, and market trends. This data can be used to identify customer segments based on product preferences, satisfaction levels, and brand perceptions.¹⁷² This technique is called “web-scraping”. The same process can be done by AI-powered tools for social media; in this case we talk about “Social Media Monitoring” and the objective is to extract information from hashtags, mentions, likes and social media conversations.¹⁷³

The improvement of segmentation capabilities combined with the trend towards hyper-personalization have led to an evolution in target profiling with the concept of the “marketing persona”. Marketing persona can be defined as “a detailed, semi-fictional representation of your target customer that is informed by qualitative and quantitative data about existing customers and market research.”¹⁷⁴ The marketing persona is an expansion of the concept of segment and not a substitute. The segmentation process allows company to find the ideal group of customers while the marketing persona extends this concept with a more detailed and precise description (even within the segment itself). The buyer persona offers

¹⁷² Cf. Haleem et al. (2023) p. 124. f.

¹⁷³ Cf. Kaput (2024) n.d. (online).

¹⁷⁴ Deng (2022) n.d. (online).

companies the possibility of better personalizing the marketing strategy by having a more precise and detailed description of their interlocutor.¹⁷⁵

The segmentation process and the construction of buyer personas powered by big data cannot happen without an adequate data management platform. A Customer Data Platform (CDP) aggregates customer data from different tools and touchpoints to create a centralized database accessible to other systems.¹⁷⁶ The main benefit is that CDP creates a unique vision of the customer inside a company, avoiding “data silos”.¹⁷⁷

According to the CDP Institute, the application of Artificial Intelligence tools to CDP can help with the main challenges (“bottleneck”) of a Customer Data Platform:

- Assemble data: AI systems have the ability to analyze source data files, identify their content, and suggest how this information should be organized in the main customer database.
- Convert data: AI systems can easily incorporate standard cleaning rules and, more importantly, can develop advanced processes to handle complex cases, such as processing unstructured data. In this way, companies can extract patterns and information in a faster way and from every source.

¹⁷⁵ Cf. Gregori/Pascucci (2019) p.p. 75-76.

¹⁷⁶ Cf. Decker (2020) n.d. (online).

¹⁷⁷ Data silos refer to data that is available to one department but isolated from the rest of an organization (Decker, 2020).

- Build unified profiles: AI systems have the capability to identify matches by detecting subtle patterns that human analysts might overlook or are too complex to include in a traditional rule set. They can search for novel match types as new data emerges, simplifying the process of incorporating new data sources. Additionally, they can continually verify their matching outcomes and adapt matching algorithms as the data evolves.
- Analytics: AI systems can analyze huge volume and variety of customer data, identifying relationships that solve important problems, and highlighting these for expert review. In this way it's possible to uncover new segments and new opportunities on existing segments, optimize customer treatments and make predictions.
- Execution: AI systems can simplify data integration and distribution, suggesting the right content to deliver, selecting the right channel, and optimizing time and frequency of contacts.
- Measurement: AI systems are capable of generating performance reports, analyzing test results, recommending enhancements, and estimating the impact of any modifications.¹⁷⁸

In addition to optimizing Customer Data Platform, the application of Artificial Intelligence to segmentation process provides some benefits. AI eliminates human bias, looking at data without prejudices and without making assumptions. ML

¹⁷⁸ Cf. CDP Institute (2020) p.p. 3-4. (online).

algorithms can discover new patterns in customer data which humans may not be able to uncover.¹⁷⁹ AI systems can adjust segmentation in real-time, making marketing strategy more effective and relevant over time.¹⁸⁰ The greater level of personalization achievable through AI segmentation increases relevance and effectiveness of digital marketing campaigns.¹⁸¹ Finally, since machines can significantly speed-up the segmentation process, there is no limit on the number of segments to choose and on their size.¹⁸²

A great example of the application of AI for segmentation is provided by the research on Artificial Intelligence and digital marketing by Bitkom (2024).

In its enormous catalog the German company Bayer has an all-rounder drug, called Iberogast, useful for the treatment of all intestinal disorders. The wide applications of this drug make it an attractive product for a large number of targets.

The previous digital strategy focused on increasing traffic on the website without making any distinctions on the value of users. The new strategy aims at attracting high-value customers, those who are actively seeking digestive health products. In other words, the objective is to switch from a generic target to a specific one, preferring a value-based strategy to a volume-based one.

¹⁷⁹ Cf. Mandapuram et al. (2020) p. 144.

¹⁸⁰ Cf. Kumar et al. (2024) p. 7.

¹⁸¹ Cf. Apriani et al. (2024) p.p. 323-324.

¹⁸² Cf. Mandapuram et al. (2020) p. 144.

For this purpose, in collaboration with Google and Essencemediacom, an automated value-based bidding process has been established based on data collected and analyzed by Artificial Intelligence systems.

Three Google solutions have been used:

- Google Analytics 4 was used to collect and analyze data about web sites, such as page view, time on page, traffic source, page navigation and many more.
- Search Ads 360, leveraging AI, used these data to address the best combination of advertisements to the target group.
- Value Based Bidding ensured that high-value users were targeted precisely.

The utilization of Google's AI-enhanced models has yielded significant results: the number of high-value conversions increased by 108%, the value of conversions surged by 39%, and the cost per acquisition (CPA) decreased by 42%.¹⁸³

3.2 Digital Audit and Context Analysis

¹⁸³ Cf. Bitkom (2024) p.p. 24-25. (online).

The realization of a digital strategy should start from the analysis of the external and internal context, to understand the company's presence online and the dynamics of the competitive arena.¹⁸⁴

This activity is called “digital audit” and is a comprehensive assessment of a company's digital assets and presence. Auditing has two dimensions:

- External dimension: it focuses on the variables that determine the digital environment, such as the online presence of competitors or opinions regarding the brand and products.
- Internal dimension: it concerns the internal situation of the company in relation to online activity and therefore focuses on the analysis of the website, SEO, social media, and all the activities carried out online.¹⁸⁵

Monitoring online platforms represents an essential element for both dimensions. Machine Learning and Deep Learning models can enhance web-scraping techniques, extracting meaningful information from websites. This Artificial Intelligence application is very useful for competitive analysis because it guarantees a collection of relevant information on competitors, but also to gain meaningful insights on the company's website from an internal perspective.¹⁸⁶ About competitors, the web scraper provides information on products and prices,

¹⁸⁴ Cf. Piñeiro-Otero/Martínez-Rolán (2016) p. 41.

¹⁸⁵ Cf. Gregori/Pascucci (2019) p.p. 66. f.

¹⁸⁶ Cf. Ming-Hui/Rust (2021) p. 33.

customers, market trends, positioning, customer reviews and, even, content strategies. The same information can be extracted from the own website to evaluate performances and the current situation.

Important information is also extracted from social media through social media monitoring activity. In addition to the aforementioned data, in these digital platforms, the monitoring focuses on user's "conversations" (already occurred or in real-time), which are fundamental for understanding opinions regarding products, brands and competitors.¹⁸⁷

The implementation of Natural Language Processing tools to textual data analysis and Computer Vision algorithms to images and videos scanning has improved the speed, precision, accuracy, and efficiency of these processes.¹⁸⁸

In the context of digital audit, there are two other very useful techniques in which the application of AI systems has a great impact: sentiment analysis and predictive analysis.

Sentiment analysis is the process of analyzing digital text to determine if the emotional tone of the message is positive, negative, or neutral.¹⁸⁹ The final aim is to understand what customers think and feel about the company, the brand, and its products.

¹⁸⁷ Cf. Gregori/Pascucci (2019) p. 66.

¹⁸⁸ Cf. Moradi/Dass (2022) p.p. 305-306.

¹⁸⁹ Cf. Taherdoost/Madanchian (2023) p.p. 1-2.

Artificial Intelligence can automate this process, using Machine Learning algorithms and Natural Language Processing technology to gain information from customer reviews, comments, posts on social media and conversations.¹⁹⁰ In this way, companies can make more informed decisions on channels and methods to communicate to customers. Also, companies can understand customers' perceptions about competitors favoring better positioning.¹⁹¹

Deep Learning algorithms are crucial for sentiment analysis, as they undergo training using vast datasets containing labeled sentiments. Through this training, they learn to recognize patterns and connections among words, phrases, and sentiments. As a result, these sophisticated algorithms become capable of automatically categorizing new text data according to sentiment.¹⁹² Deep Learning has the ability to find intricate correlations between data; moreover, it can extract information from multimodal data, incorporating information from images, videos and audios. Finally, the algorithm learns and improves continuously making this analysis gradually more accurate.¹⁹³

T-Mobile provides a great use case for AI-empowered sentiment analysis. The leading telecommunications provider found it difficult to handle the enormous

¹⁹⁰ Cf. Priya et al. (2021) p. 602.

¹⁹¹ Cf. Taherdoost/Madanchian (2023) p. 2.

¹⁹² Cf. Srivastava (2023) n.d. (online).

¹⁹³ Cf. Islam et al. (2024) p. 3.

amount of feedback by customers: with around 15'000 messages each month it was hard to identify the drivers of customer satisfaction.

To face this challenge, T-Mobile adopted SentiSquare AI tool, a NLP system that helps with data processing and sentiment analysis. The implementation of this tool provided some important functionalities in T-Mobile customer satisfaction analysis:

- Comprehensive feedback analysis: with the integration of SentiSquare AI, T-Mobile efficiently processed and categorized every incoming message, allowing for a clear overview of customer feedback topics and sentiments. This real-time analysis provided invaluable insights into what drove customer satisfaction.
- Advanced Analytics Tool: SentiSquare provided T-Mobile with an intuitive analytics tool that facilitated deep exploration of customer feedback, making it simpler to spot trends and patterns.
- Real-time Insights: SentiSquare AI offered real-time insights into customer sentiments, enabling T-Mobile to swiftly make focused decisions. This real-time feedback loop empowered the company to take immediate action and address customer concerns promptly.

The use of AI for sentiment analysis provided T-Mobile with a clear and unbiased view of customer sentiment and drivers of satisfaction resulting in an ability to respond more quickly to their needs.¹⁹⁴

All the information extracted from the web can be used, also, to make predictions on future trends and situations. Predictive analysis is fundamental for digital auditing because the online scenario is always evolving providing new opportunities for companies but, also, risks and challenges to face.

Predictive analysis is based on predictive analytics; in data science predictive analytics is about predicting what will happen in the future analyzing data from the past. While manual predictive analytics methods can take hours to generate a solution based on a couple of hundred data points, ML predictive analytics models will be able to generate a solution based on millions of data points in a matter of minutes.¹⁹⁵

AI technology enables marketers to pinpoint emerging trends and predict their future trajectory. Armed with this insight, they can strategically allocate resources and target specific demographics for maximum impact.¹⁹⁶

In addition to environment monitoring, predictive analysis in digital marketing is very useful to predict what customer is more likely to convert; marketing

¹⁹⁴ Cf. SentiSquare, n.d. (online).

¹⁹⁵ Cf. Mailchimp (a) n.d. (online).

¹⁹⁶ Cf. Haleem et al. (2022) p. 122.

strategies and, in particular, contents can be adjusted to target these prospects based on their preferences and needs.¹⁹⁷

Mastercard provides an example of successful predictive analysis with AI. To overcome the problem of low attention span, the company developed an entire system powered by AI to make predictions on trends and engage customers with personalized and contextually relevant content. This system is called Mastercard Digital Engine, and its functioning is explained by Raja Rajamannar, chief marketing and communications officer of Mastercard.

The engine predicts micro trends (or hot topics) based on conversations happening on the web; these micro trends are then compared with Mastercard's current experiences, products and offers, to see if there are some matches with customer interests and desires. The marketer can then decide whether to launch a campaign with a Mastercard Priceless¹⁹⁸ experience, offer, or reward, with highly personalized and contextually relevant content.

The main advantage of this system is that the company can enter the most viral conversations in a natural and organic way, resulting in a very high effectiveness. For example, for a campaign in collaboration with a European tourism board to promote their country to residents of the adjacent nation the engine predicted

¹⁹⁷ Cf. Kumar et al. (2024) p. 6.

¹⁹⁸ The Priceless program is a promotional program containing experiences, offers and content available to Mastercard cardholders.

some micro trends and matched them with compelling content and offers related to travel, culinary and culture. The campaign registered 16% lower cost per reach, 20% more people reached, 87% lower cost per engagement, 25% higher rate of engagement, 38% lower cost per click, and 96% higher clickthrough rates.¹⁹⁹

3.3 Chatbot and Virtual Assistant

Chatbots began to spread into managerial practice from 2010, in response to customers' desire for immediacy in communication.²⁰⁰ A chatbot is a direct marketing tool that automates some activities and that allows companies to achieve a specific goal by chatting with a user. Utilizing extensive data, chatbots can cultivate a bond between customers and the company by providing rapid responses, convenience, tailored experiences, and smooth interactions that meet the demands of modern and digital consumers.²⁰¹

Companies use these tools especially for customer care. Virtual assistant can mimic human intelligence interpreting customer request and responding

¹⁹⁹ Cf. Rajamannar (2023) n.d. (online).

²⁰⁰ Cf. Gregori/Pascucci (2019) p. 29.

²⁰¹ Cf. Kumar et al. (2024) p. 10.

accordingly. This highly efficient communication approach enables affordable 24/7 customer support.²⁰²

However, it is a mistake to consider this technology only as a substitute of human customer care: “the goal of chatbot is not to replace human interaction with a robotic simulation, but rather to provide enhanced service to the customer, assisting them in each stage of their purchasing process.”²⁰³ In this sense chatbots and virtual assistants should be considered as valid marketing tools, guiding customer through their journey, providing personalized information and responses, supporting customers in real-time and creating a seamless purchasing experience.

There are different types of chatbots. We can distinguish among:

- Informative chatbot: they have the task of satisfying information needs by shaping the contents based on user interests.
- Utility chatbot: they solve a problem based on a specific request made by the user via chat.²⁰⁴

Moreover, there are “simple” chatbots that simulate conversations through a predetermined pattern and simple rules, and more advanced chatbots, which, being based on Artificial Intelligence and Machine Learning systems, generate a

²⁰² Cf. Moradi/Dass (2022) p. 307.

²⁰³ Gregori/Pascucci (2019) p. 30.

²⁰⁴ Cf. Gregori/Pascucci (2019) p. 32.

conversation in response to user queries and learn from them.²⁰⁵ Among these, ChatGPT, launched in November 2022, is the most famous and the most used among marketing professional as a GenAI tool.

AI-empowered chatbots and virtual assistants make use of Machine Learning techniques for learning. These systems learn with experience and with each new interaction: they memorize and reprocess the prompts and feedback received by users so that when an input recurs, they are able to recognize it and provide the most appropriate response.²⁰⁶ If the system can't respond appropriately the question is forwarded to the marketing team, which, after resolving the issue, provides feedback to the chatbot so that the system will be able to cope with similar requests in the future. This reinforcement learning mechanism makes the tool little by little more accurate.²⁰⁷

Deep Learning methods are also integrated into chatbots, with Natural Language Processing assisting the machine in understanding, processing, and interpreting human language. Specifically, the Question Answering application of NLP forms the backbone of every chatbot.²⁰⁸ Furthermore, Computer Vision can give the chatbot the ability to extract information from visual content,²⁰⁹ useful for

²⁰⁵ Cf. Feng et al. (2024) p. 2.

²⁰⁶ Cf. Gregori/Pascucci (2019) p. 30.

²⁰⁷ Cf. Moradi/Dass (2022) p. 307.

²⁰⁸ Cf. Priya et al. (2021) p.p. 600-601.

²⁰⁹ Cf. Moradi/Dass (2022) p. 307.

providing more relevant information based on object detection, face recognition and emotion analysis.

Although they are often used as synonyms, the main difference between chatbots and virtual assistants lies precisely in the technological content: the latter, in order to carry out various tasks, incorporate more sophisticated and advanced technologies than the former.

Some examples of famous chatbots and virtual assistants are Bard by Google, ChatGPT by OpenAI, Aligenie by Alibaba, Siri by Apple, Copilot by Microsoft, and Alexa by Amazon.

Feng, Botha, and Pitt (2024) proposed a framework to assess the impact of AI chatbots (more specifically, chatbots powered with Generative AI) on the organization, with a three levels analysis: micro, meso, and macro.

- Micro: on a micro level, chatbots especially impact the work of employees in terms of productivity, learning and creativity.

About productivity, chatbots can be customized on specific needs to provide tailored assistance to employee. Moreover, chatbots can be very useful to automate routine and tedious tasks, freeing up time for more critical activities: functionalities, such as data analysis and file uploads, and product specialized in productivity-boosting, such as Notion AI or Ellie, play a very important role in this process.

Chatbot can also facilitates learning process of employees by disseminating tacit knowledge from more experienced employees to the new and low-skilled ones. With chatbots as personalized tutors, the time to train new employees can decrease by months.

Finally, chatbots can be a booster for creativity. Thanks to chatbots employees can discover new patterns and perspectives on different domains, identifying relations that were previously hidden. The global reach exposes employees to new approaches and situations, fostering idea generation and innovativeness.

- Meso: on a meso level, chatbots impact the work of company's department and business area. Among these, marketing is particularly affected by this technology. Chatbots and virtual assistants can enhance customer engagement and improve experience, by generating targeted and coherent responses to customer needs and preferences. They can recognize users' emotions and react appropriately, establishing a deeper relationship with them.²¹⁰ These tools offer the possibility to record conversations and extract meaningful data from them; in this way companies can understand needs, desires, and most frequent questions and problems.²¹¹ Chatbots can help companies in creating a seamless experience, which nowadays is

²¹⁰ Cf. Kumar et al. (2024) p. 10.

²¹¹ Cf. Gregori/Pascucci (2019) p. 34.

required by customers. Leveraging large amounts of data, they can understand the need of consumer in every stage of the customer journey and then offer the right message with the right information at the right time.²¹² Furthermore, customers can access real-time support at any time of the day.²¹³ All this favors the fluidity and smoothness of the experience. This technology not only simplifies organizational processes but also aligns the company with changing customer demands and market trends.²¹⁴

- Macro: on a macro level GenAI chatbots have the potential to reshape entire industries and create new business models. In healthcare, for example, they streamline diagnostic processes through initial medical consultations, revolutionizing patient triage efficiency. Similarly, in customer service, chatbots provide 24/7 support and personalized interactions, reshaping engagement practices towards more customer-centric approaches.

Also, the competition is changing: chatbots make specialized knowledge and expertise more accessible helping companies in achieving cost advantages, better targeting and personalization, efficiency, and

²¹² Cf. Kumar et al. (2024) p. 10.

²¹³ Cf. Gregori/Pascucci (2019) p. 34.

²¹⁴ Cf. Feng et al. (2024) p. 6.

effectiveness. In this regard, hiring people with skills in GenAI can become an important source of competitive advantage.²¹⁵

Sephora is one of the companies that adopted chatbot technology to enhance its customer journey and experience.

Sephora is a global leader in the cosmetics and beauty industry, with over 2,600 stores across 35 countries, and, from 1997, is part of LVMH group.

The company has always believed in the importance of a unique beauty experience and in customization with a selection of 78,000 items and 860 brands.²¹⁶ This is reflected in one of Sephora's key objectives which is precisely to provide an unforgettable experience to its customers, whether online or in store. For this purpose, the company gathers marketing data, especially from shopping habits such as browsing behavior on the web page or products placed in the shopping cart, and then exploits this information to segment the audience and personalize the journey.²¹⁷

In order to strengthening the relationship with its customer, from 2016, Sephora has adopted different chatbots, becoming one of the first adopters of this technology.²¹⁸ The first chatbot was developed on Kik, a Canadian application for instant messages; then other two chatbots were developed on Facebook, Sephora

²¹⁵ Cf. Feng et al. (2024) p.p. 4. f.

²¹⁶ Cf. LVMH (n.d.) (online).

²¹⁷ Cf. Eyada/Ahmed (2022) p. 83.

²¹⁸ Cf. Wang (2021) n.d. (online).

Reservation Assistant and Sephora Virtual Assistant. Through the combination of these three bots Sephora can handle every request and situation.²¹⁹ By leveraging questionnaires to gather customers preferences, Sephora Kik's chatbot collects key details to offer personalized beauty tips, relevant products recommendations, and reviews. Also, entering any products it will provide information, review and ratings from other users. Sephora Reservation assistant helps customer with reservations for makeover at stores, while Sephora Virtual Assistant provides make-up tips and useful information for people who wants to learn make-up through video-clips and tutorials. Also, customers can try out products uploading a selfie photo or can scan an image of a celebrity to gain a list of matching products. To make the experience smooth and hassle-free, customers can purchase products directly from the chatbot without leaving the conversation.²²⁰

After the adoption of chatbots the number of orders for in-store makeover increased by 11% in the US; on average, customers who used chatbots to reserve this service ended-up spending over 50\$ in store.²²¹ Thanks to AI-chatbots and other digital technologies Sephora managed to create a unique online experience for its customers. According to Statista, the result of this process is a huge

²¹⁹ Cf. Eyada/Ahmed (2022) p. 84.

²²⁰ Cf. Lee (2020) p. 108.

²²¹ Cf. Wang (2021) n.d. (online).

increase in its e-commerce sales, which have more than quadrupled, going from \$580 million in 2016 to \$3 billion in 2022.²²²

3.4 Advertising

The diffusion of ICT, including Internet, social networks, computers, and cell phones, created new ways for companies to reach customer through advertising. The birth and expansion of digital platforms push many companies to convey their advertising messages through these digital channels. The advantages of online advertising, such as the greater degree of targeting, interactivity, and measurability (just to name a few), make it particularly attractive for companies.²²³

In the broad subject of "online advertising" we find programmatic advertising in which the implementation of Artificial Intelligence techniques has a notable impact. Programmatic advertising refers to the application of a data-driven approach to automate buying and selling of digital advertising spaces, helping companies meeting the right audience at the right time.²²⁴

²²² Cf. Yltävä (2023) n.d. (online).

²²³ Cf. Gregori/Pascucci (2019) p.p. 205. f.

²²⁴ Cf. Busch (2016) p. 8.

This data-driven approach makes the messages conveyed particularly effective. For this reason, this method of purchasing online advertising has been very successful and is used by many companies. According to Statista, the programmatic advertising market was worth \$546 billion in 2023 and is expected to rise to \$779 billion in 2028: a growth rate of 43% in 5 years.²²⁵ Multichannel programmatic advertising, which allows companies to reach customers across multiple channels and create a cohesive brand story, appears to be particularly effective: 19% of marketers are increasing their spend due to better ROI and performance, and 60% of them say their multichannel campaigns meet or exceed their KPIs most or all of the time.²²⁶

Programmatic advertising involves the presence of some core elements which are: advertiser, publisher, demand-side platforms (DSPs), data management platforms (DMPs), supply side platforms (SSPs), and ad exchange platform.

The advertiser is represented by the company that aims to obtain digital advertising spaces for the promotion of its products or services. Digital advertising spaces include banners of all types, adv in videos, social media and search engine advertising, advertising on streaming platforms and audio ads (in music streaming or podcasts). The advertiser uses DSPs to buy spaces and manage the entire adv campaign. DSPs are AI-based software which, through

²²⁵ Cf. Statista (2024) n.d. (online).

²²⁶ Cf. Davis (2023) n.d. (online).

algorithms, allow a company to set up its own campaign, identifying a target audience and determining how much to offer for each impression. The bids are based on various factors, such as the relevance of the ad, the target audience, and the available budget. DSPs are usually supported by DMPs providing data on the audience. DMPs, using Machine Learning algorithms, collect data from different sources and process these data to create detailed user profiles.²²⁷ For example, it identifies relevant targets based on interests, demographics, or online behavior.

Publishers are websites' owners or managers that want to monetize their activity by selling advertising spaces on their platforms. Publishers can use the SSPs to auction their advertising spaces.²²⁸ Therefore, SSPs enable publishers to manage their advertising inventory through the automation of the auction sales system which allows for revenue maximization.

The entire buying/selling process took place on an ad exchange platform which is a digital marketplace that connects advertisers and publishers through auctions. These auctions generally take place via a real-time bidding system: when a user enters a site, its data is collected and sent by the DMP to the ad exchange in order to identify available advertising spaces to be auctioned in real-time; the winning

²²⁷ Cf. Kumar et al. (2024) p. 10.

²²⁸ Cf. Riley (2023) n.d. (online).

ad is sent to the publisher and shown to the user.²²⁹ This process occurs within a few milliseconds.

The application of Artificial Intelligence in programmatic advertising mainly regards the three platforms through which the advertising spaces distribution process takes place. About DMP, AI is involved in the management of user data. Machine Learning algorithms aggregate data from different sources to improve segmentation and targeting capabilities. The creation of target audiences, characterized by specific desires, needs and preferences, is a crucial process to ensure the effectiveness of advertisement; otherwise advertising messages that are not very relevant and of little interest would be sent. Furthermore, the AI software also uses predictive analytics to anticipate future user needs.²³⁰ In DSPs, AI is involved in the optimization of monetary offers based on data regarding user behavior, competition, and campaign objective, processed in real-time. Also, DSPs facilitate the matching between advertising messages and the most relevant target.²³¹ Finally, the use of AI in SSPs concerns the management of the publisher's advertising inventory: through the analysis of past performance, Machine Learning algorithms are able to predict future demand and the best price to maximize revenues.

²²⁹ Cf. Gregori/Pascucci (2019) p. 218.

²³⁰ Cf. Riley (2023) n.d. (online).

²³¹ Cf. Kumar et al. (2024) p. 10.

The Economist, a British political-economic news weekly focused on international trade, global current affairs, politics, and technology, has successfully implemented programmatic advertising in its digital strategy. The company wanted to target “intellectually curious” readers who were reluctant to try the journal. For this purpose, they started by analyzing data about subscribers to identify reader preferences and relevant content to deliver. Then, The Economist team created lookalike audiences to target with programmatic advertising. In this way they effectively targeted the right audience with the right content, presenting ads in real-time based on web-page context and viewer profiles. The ads were linked to The Economist’s content hub and led to articles whose content was similar to what users were reading in another newspaper.

With a media budget of \$1,2 million, the campaign created 650’000 new prospects and 3,6 million action post-ad viewing (ROI was 10:1).²³²

Qin and Jiang (2019) identified several applications of AI to digital advertising process that impact not only programmatic advertising but also the broader digital promotion strategy. Their study focuses on:

- Advertising research and market analysis: AI technologies are used for real-time data gathering and processing. Also, the implementation of NLP models help to extract information from unstructured data, such as images or videos.

²³² Cf. Keane (2023) n.d. (online).

- Ad design and copywriting: refers to the use of NLP and Deep Learning algorithms for the creation of adv contents and materials, such as attractive copy, images or video. The generation of these contents is based on previous data analysis to understand customer's acceptance of different advertising ideas.
- Media planning and buying: refers mainly to the aforementioned applications of AI to programmatic buying through real-time bidding. Programmatic purchasing occurs after a careful analysis phase of the touchpoints and the impact of the advertising campaigns.
- Ad performance evaluation: refers to the acquisition and exploitation of feedback on the impact of an advertising campaign. Convolutional neural networks and Machine Learning algorithms work together for the collection of feedback, respectively from sentiment analysis and different online sources. The feedback is then compared to the expected advertising goals and objectives. Accordingly, changes are made to the targets and the contents of campaigns.²³³

In its study about digital marketing and Artificial Intelligence, Bitkom provides a great example of creating advertisements with Generative AI.

SDH IT GmbH, a software development and IT consulting company, wanted to improve the effectiveness of its LinkedIn advertising campaign for its online app

²³³ Cf. Qin/Jang (2019) p. 341. f.

development cost-calculator tool. The company then adopted ChatGPT to generate titles, descriptions, and various texts for the ads. These variants were tested through A/B testing on LinkedIn to evaluate the performance of each advertising text and identify the best strategies to obtain higher click-through and conversion rates. One of the variants generated by ChatGPT achieved a click-through rate of 3,7% and a conversion rate of 4,1%; this represents an increase of 35,2% compared to previous campaigns. The implementation of Generative AI has brought more engagement and effectiveness to SDH's advertising campaigns.²³⁴

3.5 E-mail Marketing

E-mail marketing is a direct marketing technique that uses e-mail to send advertisement, promotional messages, and commercial information to a list of subscribers or contacts. Even though in the last years some marketing techniques and tools have reached very high levels of adoption (such as social media), e-mail is still one of the most used tools to connect with customers. As a part of the broader Content Marketing strategy, this technique allows companies to reach a

²³⁴ Cf. Bitkom (2024) p. 27. (online).

wide audience at a low cost; moreover, it is a great tool to achieve a high level of personalization as any aspect can be tailored on customer preferences and features.²³⁵ Other advantages of email marketing regard the flexibility and cost-effectiveness to reach customers: its scalability does not affect customization, which can arrive to an individual level, nor the cost, which still remains lower than other campaigns. Finally, emails offer the possibility to send different format of data (text, images, hyperlinks...) and mixing them to find the best combination.²³⁶

There are several ways to approach an e-mail marketing campaign. The most common is a newsletter, which is an ongoing relation with customer through a regular email sending. Besides newsletter, companies can contact customers to announce new content, deliver promotions and discounts, provide products update with a frequency that varies depending on the content and the pursued objective.

An email marketing campaign can have different objectives:

- Content promotion: companies can use emails to share blog content or others relevant content.
- Lead generation: companies can access personal information and create new leads in change of meaningful information or other valuable assets.

²³⁵ Cf. Nobile/Cantoni (2023) p. 1.

²³⁶ Cf. Piñeiro-Otero/Martínez-Rolán (2016) p. 41.

- Build relationships: companies can build connections through personalization of engagement.
- Brand awareness: thanks to regular publications companies can keep its products top-of-mind in customer perceptions.
- Promote products and services.²³⁷

AI is able to automate many processes related to email marketing, providing efficacy and effectiveness to this technique. First, ML algorithms can help with the optimization of the mailing list, which is central to e-mail marketing activities: AI can review existing lists to determine the probability that a single contact or an entire list is valuable; furthermore, ML systems can keep track of responses and interactions to understand the quality of e-mail address; based on these analysis, the algorithm can, finally, proceed with cleaning the mailing list by eliminating poor quality contacts. In this way companies can focus on the most precious contacts, avoiding wasting time, money, and effort on prospects of little value.²³⁸ Artificial Intelligence can, also, provide an optimization of frequency and sending times: analyzing historical data, such as open rates, click rates, and conversion rates, predictive AI can provide insights for deciding how often to send emails and the best moment.²³⁹ This serves to avoid overloads of emails that will not be read

²³⁷ Cf. Santiago (2024) n.d. (online).

²³⁸ Cf. Mailchimp (b), n.d. (online).

²³⁹ Cf. Araùjo et al. (2022) p. 10.

and to reach customers at the best times for them, increasing the possibility of interacting. For campaign optimization, further insights can be carried out on different aspects such as the best contact methods, which types of products get the most responses, and the headers that generate the most engagement. All these elements can be evaluated through A/B Testing to determine the option that leads to higher conversion.²⁴⁰

Generative Artificial Intelligence is particularly effective for writing the e-mails. First, AI fosters idea generation, providing personalized suggestions and different ideas for the brand. For example, marketers can ask ChatGPT to provide a list of proposals for creating promotional emails by entering specific requests in the prompt (launch of the summer collection, promotional code for the birthday...). Not only GenAI can boost creativity, but it can be implemented in writing the entire email or parts of it. NLP models play a central role in this activity, processing customer data to create human-like and highly personalized text. Also, Computer Vision algorithms can be used to generate images and graphics to improve the visual part of the message. Companies can integrate the historical data from their customer relationship management (CRM) system to reach a high level of personalization, with offers, suggestions, and recommendations for individual customer.²⁴¹

²⁴⁰ Cf. Miller (2023) n.d. (online).

²⁴¹ Cf. Haleem et al. (2022) p. 127.

Finally, AI can be applied to automate design and delivery of e-mail. This process is usually linked to specific customer actions; for example, when a user makes an online purchase the system automatically sends an email with the receipt or other information.²⁴² In this regard, there are some platforms, such as Rasa.io, which are specialized in the creation of a smart newsletter: these systems automate the entire newsletter, from the creation of individually curated contents for each customer, to delivery, increasing reader engagement.²⁴³

According to the Survey conducted by Statista (2023) on the effectiveness of e-mail marketing, 51% of marketers believe that AI-empowered e-mail marketing is more effective than the traditional one; around 20% saw no difference and the rest is not sure yet.²⁴⁴

There are different organizations that adopted AI-powered tools for their e-mail marketing activities and that provide interesting case studies.

DATEV eG is a German software house, one of the largest in Europe, with over 200 software products and services and around 40'000 members. For its e-mail marketing campaign, the company was struggling to identify text and images preferences for different target groups. Furthermore, once emails were sent with a specific combination of text and images, it was not easy to get suggestions for

²⁴² Cf. Mailchimp (b), n.d. (online).

²⁴³ Cf. Kaput (2022) n.d. (online).

²⁴⁴ Cf. Dencheva (2023) n.d. (online).

improvement. DATEV has adopted Generative AI to face these problems. In addition to the analysis of the classic KPIs (opening rate, click rate, conversion rate), GenAI carries out an intelligent analysis of the contents: it recognizes which campaigns have been successful and creates text and image suggestions for the individual target following the motto "which texts and images does the recipient like?". As time passes, AI generates consumer preference models which are refined and perfected with each subsequent sending. In this way, the contents always adapt better to customer preferences. DATEV has, therefore, personalized its e-mails adapting them to the needs of the target groups; this favored greater user involvement, greater opening of e-mails and greater effectiveness of campaigns.²⁴⁵

Another great example of successful AI implementation in e-mail marketing is provided by the American Marketing Association. AMA is a professional association of marketing professionals with more than 40,000 members, which over time has become a point of reference for marketers from all over the world. The association offers training, opportunities, and events in the field of marketing and boasts different publications such as Journal of Marketing, Journal of Marketing Research, Journal of Public Policy and Marketing, Journal of International Marketing e Marketing News.

²⁴⁵ Cf. Bitkom (2024) p.p. 43-44. (online).

AMA needed to find a way to better connect with its large membership and make sure its newsletters were getting noticed. So, they partner with Rasa.io to use their AI technology to personalize emails for each reader, ensuring that AMA's content stood out and engaged its audience effectively. The adoption of Artificial Intelligence systems, helped the association automate the newsletter, engaging with their subscriber on a regular basis and keeping them updated on the latest marketing news. Rasa.io allows AMA to deliver e-mail daily, speeding-up the creation process of the messages and, also, favoring a better personalization of text and subject line. The benefits of this partnership are:

- AI-driven personalization boosted reader's engagement, driving visitors to AMA website, significantly improving traffic.
- Rasa.io provided important insights on subscribers which can be combined with behavioral data to create internal content that resonates with members' interest and trends.
- Open rate and click rate significantly increased: with a 47% weekly open rate and 10% weekly click rate, AMA surpasses industry standards.
- The automation of newsletter allows AMA to save over 75 hours of time per month and other resources that can be allocated on other value-adding activities.²⁴⁶

²⁴⁶ Cf. Rasa.io (online).

3.6 Search Engine Optimization

Search Engine Optimization (SEO) is one of the fundamental pillars of Search Engine Marketing (SEM) and can be defined as a set of activities aimed at improving the positioning of a website in search engines in relation to certain keywords.²⁴⁷ The importance of this marketing technique has gradually grown during the years because of different factors: first, consumers use search engines as their primary source of information; second, information overload has made a company's contents just a drop in an ocean of information in which emerging is very difficult; finally, the new consumers want "everything right away" and are not willing to navigate through different pages of results to get what they are looking for.²⁴⁸ Given this context, it seems clear that the optimization of content and web pages from a SEO-friendly perspective becomes essential.

Artificial Intelligence in SEO has the power to automate some processes and helping marketers with the main activities. AI-powered tools can speed up keywords research, which is central in the optimization for search engines. Incorporating these key terms into website content and metadata strategically helps search engines like Google and Bing evaluate the relevance of the website's

²⁴⁷ Cf. Yalçın/Köse (2010) p. 488.

²⁴⁸ Cf. Gregori/Pascucci (2019) p. 145.

content.²⁴⁹ Companies should focus on the so-called “long-tail words” which better define the research topic and are generally associated with an audience that is more interested and more likely to convert. By leveraging Machine Learning and Natural Language Processing it is possible to discover meaningful keywords allowing marketers to quickly identify relevant terms and phrases related to their niche. For this purpose, there are several AI-powered online tools which can help to find keywords.²⁵⁰ For example, SEMrush’s Keyword Magic Tool automatically provides suggestions for keywords to use in online content, based on its database of 25 billion keywords. Not only AI is useful to find the best keywords, but it is also a good tool for evaluating the relevancy of some terms and to predict their ranking. For example, companies can ask ChatGPT to check a list of keywords, evaluating their relevancy and probability of obtaining visibility with those words.²⁵¹

Beyond keywords, AI can optimize entire company contents to make them more SEO-friendly. Search engines favor websites with high-quality content i.e. content relevant to user searches, clear in its presentation and which has a high probability of being shared with other people via word of mouth. In this regard NLP machines can write entire blog post or other data-driven content, selecting and

²⁴⁹ Cf. Rathore (2016) p. 32.

²⁵⁰ Cf. Dumitriu/Popescu (2020) p. 633.

²⁵¹ Cf. SEMrush (2023) n.d. (online).

implementing the chosen keywords; it can provide meaningful recommendations and suggestions to optimize the content for ranking; it can personalize the content based on user search-queries to make it more relevant and it can conduct A/B test to improve the content.²⁵² For example, SEMrush's SEO Writing Assistant is an AI-powered online tool that, as the name says, helps companies optimize their content for engagement and search performance. Simply upload or write your own text on the platform and the smart writing editor provides real-time suggestions on keywords and other elements.²⁵³

In the field of on-page optimization, there are some AI tools which can be used to implement a schema markup on the page. Schema markup can be defined as a type of code that added to a website helps search engines better understand the content of pages. Schema markups provide specific information about the webpage, giving more context and improving categorization and ranking. Creating schema markup requires coding skills because it involves integrating it into the website's back-end code. Generative AI tools can overcome this requirement and automate the process, furnishing the entire code; marketers only have to copy and paste this code in the HTML of the chosen web page. For example, Jasper has a FAQ Schema Generator, useful to create structured data for frequently asked questions. The process is very simple: write your questions with

²⁵² Cf. Ha (2022) p. 400.

²⁵³ Cf. SEMrush (2023) n.d. (online).

the corresponding answer in the prompt and ask the platform to create a schema markup. In few seconds the schema is ready to be used on the website. This element is useful not only for SEO but, also, to improve the user experience making it easier for users to find the information they need.²⁵⁴

Shifting attention to off-page optimization, backlink analysis can provide relevant insights and suggestions. Having links from other websites (called “backlinks”) that point to company's content is one of the fundamental elements for ranking well from a SEO perspective; backlinks are a clue to search engines that the contents of a site are interesting and valuable. Search engine algorithms, usually, favor quality over quantity: a backlink from an authoritative source is rated more positively than many spam links.²⁵⁵ AI can be used to find opportunities for link building and to conduct backlink analysis. This is done by analyzing links that already exist, providing insights on their structure and on what type of content is more likely to generate backlinks from reputable sources. Moreover, ML algorithms are very useful when it comes to monitoring links and detecting changes that may affect the ranking; it can identify broken and malicious links as well as changes in search engine algorithms that may impact the position on SERPs. SEMrush has two AI tools that can help companies for these activities: SEMrush Copilot AI and Backlink Analytics Tool. The former is a useful tool to

²⁵⁴ Cf. Jasper n.d. (online).

²⁵⁵ Cf. Rathore (2016) p. 32.

maintain an update backlink strategy: it sends notification when a link is lost, also providing the corresponding authority score and suggestions. The latter is one of the biggest online databases to make detailed analysis of web pages: authority score, referring domains, new and lost backlinks and total backlinks are some of the insights that a company can get both for internal analysis and to make comparisons with competitors.²⁵⁶

The diffusion of virtual assistants and Artificial Intelligence systems for voice recognition has brought a new way of searching for information which is not based on textual but vocal queries. Vocal search can be defined as an “approach in which the technology uses a voice recognition system to understand what the speaker is saying with reasonable accuracy.”²⁵⁷ This transformation has established itself in recent years as one of the main ways of searching for information and the development of some virtual assistants (such as Siri or Alexa) played a very important role in this process. Since spoken language is the most natural way for humans to communicate, the interaction with a VA reflects the normal way to acquire information; in addition, the conversation can generate a sense of social presence, meaning that feeling of warmth and intimacy that the device can transmit.²⁵⁸ Other advantages of using voice search for people regards

²⁵⁶ Cf. SEMrush (2023) n.d. (online).

²⁵⁷ Donepudi (2014) p. 91.

²⁵⁸ Cf. Hu et al. (2023) p. 110.

the search speed (3.7 times faster than text input) and its ideal implementation in portable devices, such as smartphones.

This new way of searching for information has profound implications from a SEO perspective. In fact, today we tend to distinguish between traditional SEO, which concerns text searches, and voice search SEO, which concerns voice searches.

For a business this means optimizing content and technical elements to improve positioning (also) in voice-based search results. Unlike traditional text-based searches, voice search queries often resemble natural speech, being more conversational and question-oriented. For example, if the text-query is “best restaurant Rome” the corresponding vocal search could be “what is the best restaurant in Rome?” which is longer and quite different. To optimize for voice search, businesses should prioritize long-tail keywords and mimic the natural language people use in everyday conversation. Content should be designed to answer common questions directly and maintain a conversational tone. Additionally, technical optimization is crucial; this includes ensuring fast site speeds, mobile compatibility, and the use of structured data like schema markup (see above) to facilitate better understanding and retrieval by voice assistants. Businesses should also take into account the context of voice searches, such as location-specific queries and the use of devices like smart speakers. By focusing on these aspects, companies can improve their visibility in voice search results,

thereby expanding their reach and engagement with users who depend on voice-activated technology.²⁵⁹

BrightEdge is an enterprise SEO marketing company that helps businesses developing successful SEO strategies. Their activity is based on a series of digital tools based on Artificial Intelligence and Machine Learning algorithms to deal with the main processes of SEO (keywords research, content optimization, backlinks analysis...), such as Data Cube, Copilot, Keywords Reporting...

BrightEdge has collaborated with many prestigious companies including Meta, Zuckerberg's technology giant. Meta SEO team was successfully ranking for branded keywords and contents; however, when it comes to non-branded contents, which have usually higher conversion rate, they lacked visibility and wanted to improve traffic. In particular, they needed a scalable way to optimize 40k pages and track performance for non-branded content. With BrightEdge, they focus on three core areas:

- Content optimization: by leveraging DataCube and Content Research to understand current rankings and competitor's current rankings, they create content that is in high demand for non-branded topics. Also, they used BrightEdge Instant to understand how people were searching for a specific information or to study search volume trends.

²⁵⁹ Cf. Dewatmoko et al. (2024) p.p. 5055-5056.

- Business intelligence: they used Keyword Reporting and Bulk Keyword Volume to evaluate the performance of current pages in rankings and search volume for Meta products on Facebook.com/business.
- Technical SEO: they leveraged the Site Audit tool to identify issues such as broken links, missing metadata and slow page load speeds and then allowed the web development team to work on and improve them.

The results were a 20% increase in organic traffic, the average monthly traffic doubled, a 30% traffic growth in non-branded keywords, highest levels of engagement and lowest bounce rate on the organic search channel.²⁶⁰

3.7 Social Media Marketing

Social media represents one of the pillars of marketing strategy and one of the most used tools by companies to convey their messages. Social media marketing can be defined as a marketing technique that uses social media platform to interact and to reach out to customers.

Some of the applications of AI technology to digital marketing seen in the previous paragraphs are applicable to this discipline, with the necessary

²⁶⁰ Cf. BrightEdge (n.d.) (online).

adaptations. For this reason, they will only be mentioned, referring to the respective paragraphs for further information. Therefore, AI can enhance segmentation and targeting (chapter 3.1), identifying the best target for specific content. Social media, also, are full of useful information to broaden knowledge of the customer and the competitive arena; ML algorithms collect these information for competitive analysis and other analysis. Social media sentiment analysis is one of the most popular applications of AI to social media, with Deep Learning systems detecting user emotions to facilitate decision-making processes (chapter 3.2). Even chatbots are frequently used in daily practice to improve customer experience on social platforms (chapter 3.3).

At an operational level, effective social media management requires a continuous process, not only for creating content, but also for planning it and deciding how to convey it. These activities can be automated by AI, making them faster and more efficient. For example, companies can ask ChatGPT or use online tools to create an editorial plan with a related publication calendar, designed on the specific needs of the company and/or user; this editorial plan can then be integrated with ideas and contents from marketers. In this way the content creation and scheduling processes can be speeded up and improved. Furthermore, through

predictive analysis, ML algorithms can also automate the release of posts by identifying the best moments to generate greater engagement.²⁶¹

Sistema Brasileiro de Televisão (SBT) provides a great case study for workflow automation. The major Brazilian broadcaster faced challenges with its decentralized social media management, particularly on Facebook, where it posts 100-150 pieces of content daily. With 20 different staff members posting independently, the process was time-consuming and inefficient. To address this, SBT adopted AI and Machine Learning technology for marketing automation. AI provided several benefits: it recommended optimal content to post, facilitated easier management across multiple team members, and automated workflows. By analyzing platform trend data and audience engagement, the AI determined the best times to post, continuously updating based on real-time data to maximize reach and engagement. This resulted in substantial performance improvements: within four months, daily clicks increased by 25%, organic impressions by 61%, and Facebook impressions by 52%. Twitter pageviews also rose by 63%. The AI also improved workflow efficiency, saving SBT 14 hours per day by automating nearly 40,000 posts. This increased both traffic and impressions while freeing up time for strategic planning. SBT aims to further enhance its social media strategy

²⁶¹ Cf. Sadiku et al. (2021) p. 16.

by dedicating specialists and creating an audience/networking team, with AI playing a critical role in these efforts.²⁶²

The greatest contribution of AI and, in particular, Generative AI for social media concerns the creation of content. As was seen in chapter 2.3, marketers can leverage GenAI tools to generate realistic and appealing contents to drive interactions and engagement in the company's social media profiles. Different companies are already exploiting this potential for their social media activity. Nestlé, a multinational active in the food sector, has experimented several times with the use of GenAI for the creation of contents, as can be seen by browsing their Instagram profile. To promote the line of yogurt and desserts "La Laitière" the company collaborated with Ogilvy, a famous advertising agency. Ogilvy team took advantage of DALL-E2's "Outpainting" function to reinterpret the famous painting "The Milkmaid" by Vermeer by adding new characters and details to the original image.

Tinder, the main dating site, has also used Generative AI to create images for social profiles. On Valentine's Day 2023, the company published an innovative campaign called "LoveIsInTheAI" on Italian, French, German and Spanish social profiles. The campaign aimed to raise awareness on the issue of homosexuality by representing images of love in countries where homosexuality is a crime.

²⁶² Cf. Burstein (2022) n.d. (online).

One of the first Italian companies to experiment Generative AI for social media content is Barilla through its brand Mulino Bianco that produces biscuits, snacks, brands and cakes. The company with the help of Midjourney represented the New Year's Day breakfast in various cities around the world (fig. 3), generating interest and engagement.²⁶³

Fig. 3- Mulino Bianco AI-generated image



Source: Mulino Bianco Instagram profile.

²⁶³ Cf. VincosBlog (2024) n.d. (online).

The contents that most attracted the public's attention concern the Heinz company and the promotion of its famous ketchup. The company boasts a very long history of over 150 years and a leadership position in the sauces and seasoning market. Ketchup is its flagship product, known throughout the world. Heinz designed a creative campaign implementing DALL-E2 with the aim of rejuvenating the brand's image and connecting with a younger audience. In the video later released on social channels, the company asks the AI software what ketchup looks like, obtaining as a response an image very similar to Heinz ketchup; even by inserting strange prompts, such as “Renaissance ketchup bottle”, the result is always similar to the Heinz bottle. The conclusion is that even for AI the ketchup is Heinz. The campaign then continued on social media where the company asked users to generate further variations of the ketchup theme with AI, in a sort of co-creative experience, reposting the most particular ones. Originally launched in Canada and U.S., the campaign went globally, obtaining over 850M impressions; on social, the engagement rate was 38% higher compared to past campaigns.²⁶⁴

Tab. 1 summarizes the main applications of AI to digital marketing with the corresponding implications and case studies.

²⁶⁴ Cf. Ads of the World (n.d.) (online).

Application	Implications	Case Study
Segmentation and Targeting	- Enhancing web-scraping technique and social media monitoring for data collection. - Hyper-personalization. - Optimization of CDP.	Bayer leveraged Google's AI tools to move from a generic target to a specific and high-value one, with a 108% increase in conversions, a 39% increase in conversion value and a 42% decrease in CPA.
Digital Audit and Context Analysis	- More accurate monitoring of online platforms to obtain information on competitors or from an internal perspective. - Strengthening of sentiment analysis through ML and DL. - Better predictive analysis.	T-Mobile adopted SentiSquare AI for comprehensive, real-time sentiment analysis and trend spotting. This led to clearer insights into customer satisfaction and quicker response to concerns. Mastercard developed an AI system to predict trends and engage customer with contextually relevant content. The results were 16% lower cost per reach, 20% more people reached, 87% lower cost per engagement, 25% higher rate of engagement, 38% lower cost per click, and 96% higher clickthrough rates.
Chatbot and Virtual Assistant	- Improvement of employee work in terms of productivity, creativity, and learning. - Improvement of customer journey and customer experience, through personalized and h24 support. - Creation of new business models and competitive advantages.	Sephora implemented 3 chatbots to offer information, product recommendations, advices and tips to its customers. The implementation of these technologies increased e-commerce sales from \$580 million to over \$3 billion in just 6 years.

Advertising	- Better advertising research and market analysis. - More accurate ad design and copywriting through Generative AI tools. - Automation of buying and selling of digital advertising spaces (programmatic advertising). - Improvement of ad performance evaluation.	The Economist used programmatic advertising to target the right audience, presenting ads in real-time based on web-page context and viewer profile. The result was 650'000 new prospects and 3,6 million action post-ad viewing (ROI was 10:1). SDH IT GmbH adopted ChatGPT to generate titles, descriptions, and various texts for LinkedIn ads. After an accurate A/B test, a click-through rate of 3,7% and a conversion rate of 4,1% was achieved.
E-mail Marketing	- Mailing-list cleaning and optimization. - Frequency and sending time optimization. - Campaign optimization through A/B testing of various elements (contact methods, headers...). - E-mail creation through Generative AI tools for idea generation, writing and visual content. - Automation of e-mail sending.	DATEV eG personalized its e-mails with Generative AI tools to adapt them to the needs of the target groups; this favored greater user involvement, greater opening of e-mails and greater effectiveness of campaigns. American Marketing Association partnered with Rasa.io to deliver e-mail daily, speed-up the creation process of the messages and favor a better personalization of text and subject line. The result was a 47% weekly open rate and 10% weekly click rate and a saving of 75 hours of time.

Search Engine Optimization	- Speeding up keyword research. - SEO-friendly content optimization. - Schema mark-up implementation.	Meta partnered with BrightEdge, leveraging their AI tools to improve visibility on non-branded content and to optimize 40k pages of content. The results of this collaboration were a 20% increase in organic traffic, the average monthly traffic doubled, and a 30% traffic growth in non-branded keywords.
	- Improvement of backlink analysis. - Vocal Search optimization.	
Social media marketing	- Automation of content scheduling and designing. - Improvement of content creation through Generative AI tools. - Personalization of content for greater customer engagement.	Sistema Brasileiro de Televisão adopted AI and ML to automate social media workflow, resulting in an increase of daily clicks by 25%, of organic impressions by 61%, and of Facebook impressions by 52%. Heinz implemented DALL-E2 with the aim of rejuvenating the brand's image. The company designed a very engaging campaign that went viral on social media. The use of Generative AI for content creation resulted in over 850M impressions and in an increase of engagement rate by 38%.

CHAPTER 4 – ETHICAL IMPLICATIONS

All innovations, especially those that are considered as potential revolutions, bring positive and negative aspects for society. Artificial Intelligence is no exception. If on one hand, AI guarantees automation, efficiency, reduction of errors and all the benefits seen above, on the other hand its power to innovate is so strong that doubts, perplexities, fears, and risks arise around this discipline. These concerns can, at times, reach extreme and dystopian levels: in fact, the transition from Artificial Narrow Intelligence to Artificial Super Intelligence (passing through Artificial General Intelligence) is often associated with the extermination of the human species overwhelmed by machines or with a significant redefinition of its role in many activities.²⁶⁵

If, however, these implications still seem distant in time, there are ethical and moral situations linked to the development and use of this technology which already today appear very serious and require solutions. Among these, those that are most linked to business and digital marketing are: privacy and security, transparency and explainability, bias and discrimination, and fake news.

²⁶⁵ Cf. Aggarwal et al. (2022) p. 115.

4.1 Privacy and Security

One of the main concerns emerging among consumers is the violation of privacy and data security. Concerns about privacy are fueled by several factors:

- once data is created, it may exist substantially longer than was intended, due to the minimal costs associated with data storage.
- The future uses of such data are unpredictable: after being created, this data can be endlessly reused for various purposes.
- Data generated by an individual may also unintentionally provide information about other people.²⁶⁶

This issue is not new, but it has been linked from the beginning to the spread of the internet and the web, where users, while browsing, release personal information and not to companies. However, the use of AI connected to other new technologies, such as, for example, the Internet of Things, has triggered new fears about the security of data placed online. The aforementioned AI ability to collect and process data, comparing it with data from different sources, allows for very accurate and almost personal profiling; this means that many consumer characteristics, including sensitive information, can be identified by companies without the consumers themselves being aware of it.²⁶⁷ The risk, therefore, is that companies could get hold of sensitive information, such as sexual or political

²⁶⁶ Cf. Tucker (2018) p. 423.

²⁶⁷ Cf. Carmodi et al. (2021) p. 494.

orientation, health status and so on. What consumers fear most is that these data are exploited and mistreated by organizations violating their privacy.²⁶⁸ An example of this misuse of personal information concerns the "Cambridge Analytica scandal": the consulting firm took the information of millions of Facebook users without their consent for political purposes. In this regard, AI makes consumers very vulnerable due to its great abilities in computability and data analysis. Machine Learning algorithms, combining data from different sources, can give rise to re-identification processes: this process leads to identifying a consumer starting from non-personal data, analyzing the context in which these data were released and cross-referencing them with data from other platforms. An example occurred when Netflix combined its data set with IMDb.com ratings to identify 99% of Netflix users that also had an IMDb.com account.²⁶⁹

Given the quality and the amount of data that AI systems acquire, consumers also fear for the security of such data, i.e. the ways in which they are stored and protected to prevent data leaks.²⁷⁰ AI can enhance encryption and other cybersecurity systems, but at the same time it can be a valid ally for breaking into organization databases and obtaining valuable information for malicious purposes.

²⁶⁸ Cf. Kamila/Jasrotia (2023) p. 9.

²⁶⁹ Cf. Carmodi et al. (2021) p. 494.

²⁷⁰ Cf. Wang/Siau (2019) p. 67.

In this regard, Kamila and Jasrotia (2023) stated: “AI is a double-edged sword, it can be used to enhance security and privacy and can also be used to invade privacy and pose vulnerabilities.”²⁷¹

Managing privacy and sensitive data also produces risks for businesses: the risk of using AI-enhanced tools, like ChatGPT, is that employees can feed these algorithms with confidential company information. The disclosure of this information could cause damages to the company's image, reduce competitive advantages, or create legal problems. For this reason, manuals for the correct use of ChatGPT and similar are becoming widespread or, even, some companies have banned its use.²⁷²

The same issues relating to privacy and security emerge in the field of digital marketing, where AI tools for data processing play a very important role. We can consider, for example, recommendation systems, which are an important marketing tool for the collection and analysis of information and constitute the central element of the business model of many companies (Amazon, Netflix, Spotify...). Privacy implications in recommendations systems arise in different stages:

- Data collection and sharing without user's explicit consent.

²⁷¹ Kamila/Jasrotia (2023) p. 9.

²⁷² Cf. Kshetri et al. (2024) p. 5.

- Storage risks: data stored may be subject to de-anonymization processes or may be leaked. At both stages, users are exposed to loss of utility or rights violation.
- Inference from data: users might not be aware of the insights and conclusions that can be drawn from data or, more generally, of the use that companies make of these information.
- Collaborative filtering: the recommendation system can profile a user based on other users' interactions, making it difficult to be completely shielded from inferences.²⁷³

More generally, in the field of digital marketing, an ambivalence arises: on the one hand, exploiting the available data to promote knowledge of the customer and his preferences to personalize the offer, bringing benefits to both the company and the customer himself; on the other, using the available data in a responsible, non-fraudulent manner, informing the consumer and without violating privacy.²⁷⁴ However, this ambivalence should not be considered as a trade-off, for which it is necessary to give up some information to respect privacy or, vice versa, violate privacy in order to obtain the necessary data. Instead, we need to identify legal and ethical solutions to be able to use all the necessary customer data in a responsible, legal, and non-fraudulent way.

²⁷³ Cf. Milano et al. (2020) p. 961.

²⁷⁴ Cf. Kumar et al. (2024) p. 11.

There are different measures to take to resolve issues related to privacy and data security. On a technical level, regarding AI algorithms and their development, algorithms can be designed in a way that do not need subject identification to process data, using aggregated and reference-free data to obtain the necessary insights. Moreover, user data can be stored in separate, decentralized databases and protected by AI-enhanced encryption to prevent the risk of data leaks.²⁷⁵ This area also includes the Regulatory Technology (RegTech) discipline, i.e. the use of technologies to improve regulatory compliance processes. Using ML algorithms and other AI solutions, companies can automate the management of regulatory controls and the generation of a compliance score, as well as improve data protection and compliance through data checks and recommendations.²⁷⁶

Other measures concern corporate culture and business ethics: these concepts play a very important role in respecting legal and ethical standards. Companies must encourage the dissemination of a data culture not only as a business tool but by informing their employees of the risks and critical issues. By integrating this data culture with corporate values, a sense of responsibility can be created within companies which does not just concern adaptation to the rules but promotes respect for customer privacy regardless of the regulatory framework.

²⁷⁵ Cf. Kumar et al. (2024) p. 11.

²⁷⁶ Cf. Carmodi et al. (2021) p. 501.

Finally, an effort is required from institutions to create detailed regulations on the use of AI system for data management that can protect consumers and their privacy without causing significant damage to companies. In this sense, starting from 2018, the General Data Protection Regulation (known as GDPR) has been applied to EU countries, a European Union regulation that governs how companies and other organizations process personal data. In a 2020 study, the European Parliament demonstrated that if on the one hand the GDPR provides indications for data protection in AI applications without disadvantaging EU companies, on the other hand there are some gray areas and doubts that require further regulations.²⁷⁷

4.2 Transparency and Explainability

Another recurrent concern related to Artificial Intelligence systems is related to transparency and explainability. Transparency refers to the clarity and openness with which Artificial Intelligence systems operate and make decisions. Therefore, the issue regards the way in which machines take decisions and make judgements, sometimes considered opaque and not very transparent in the eyes of consumers.

²⁷⁷ Cf. European Parliament (2020) p.p. 79. f. (online).

The “black box” inside the algorithm sometimes makes it difficult to understand how these systems work and the motivations behind a decision.²⁷⁸ A related concept is that of explainability: when the functioning of an algorithm is clear and transparent, then it is possible to explain and interpret the decisions it makes. Often, however, the lack of clarity in the algorithm leads to a failure to understand the decisions. This opacity in operation raises ethical questions, especially when the decisions made by the algorithm have an effect on people's lives; people have the right to know why a decision has been made otherwise that decision may be considered unjust.²⁷⁹ This is especially true in the healthcare sector, where algorithms are often used for diagnostics or even to suggest and prescribe medications. Since medications impact patient health, it is necessary to understand how that decision is made. Furthermore, the lack of clarity can decrease trust in AI, negatively impacting the adoption rates of this technology. When individuals understand the working of an algorithm and the execution of operations in Machine Learning, they are more inclined to use the content appropriately and to trust the algorithm and its generated outputs.²⁸⁰ Transparency and explainability lead to a third characteristic that is loudly requested by stakeholders, namely predictability. Predictability is the confidence that an AI-powered algorithm will

²⁷⁸ Cf. Wang/Siau (2019) p. 67.

²⁷⁹ Cf. Coeckelbergh (2019) p. 32.

²⁸⁰ Cf. Shin (2020) p. 547.

perform its intended functions accurately and reliably, without introducing any harmful or unexpected behaviors.²⁸¹ In fact, if the operating mechanism is clear and the results of the algorithm are explainable, there are no reasons why we should expect a result different from the one programmed.

Transparency, explainability and predictability are crucial in ethical and moral issues in relation to several factors:

- Accountability: when the functioning of the algorithm is clear is easy to attribute responsibility for its action. The problem of attribution of responsibility exploded with the development of AI and today appears as a further ethical issue that requires answers, especially in some areas such as self-driving cars and health-care sector.
- Security: the predictability of machines means that risky and potentially harmful situations for individuals or organizations can be avoided. Understanding how the algorithm works allows individuals to use it safely and without unexpected events.
- Reliability: transparency, explainability and predictability are essential elements to foster confidence in AI. The more AI spreads in various aspects of society, the more important the discussion on trust and reliability becomes. The capabilities of AI in terms of computing power

²⁸¹ Cf. Wang/Siau (2019) p. 67.

and precision of results are not sufficient to guarantee high adoption but it is necessary to work on ethical and moral issues.²⁸²

This topic is particularly relevant in the field of digital marketing where algorithmic decisions can have significant consequences for individuals and companies. In the context of recommendation systems, it becomes important to understand the mechanism by which products are recommended to improve their accuracy and reduce unpleasant situations, such as bias, discrimination or, more simply, incorrect recommendations. However, providing a factual explanation may be counterproductive. If, for example, the popularity among users is given as an explanation for a product recommendation, it could increase its desirability by generating even more popularity on the product which would therefore be recommended more often. This self-reinforcement mechanism can have negative effects on the variety of options, plurality of choice and competition.²⁸³ Likewise, in GAI systems it becomes very important to uncover how content are generated especially when the system provides answers that are difficult to verify. Understanding how chatbots process data to answers to users during online shopping (for example) helps businesses improving their ability to provide appropriate responses and, at the same time, prevent unpleasant situations from arising with customers.

²⁸² Cf. Kamila/Jasrotia (2023) p.p. 10-11.

²⁸³ Cf. Milano et al. (2020) p. 963.

Making AI algorithms more transparent benefits all stakeholders and creates a more equitable and responsible AI environment.²⁸⁴ Addressing this problem requires an effort by all the different actors involved. First of all, the contribution of those who develop and use AI (such as companies) is fundamental, as they can guarantee clarity and transparency by keeping track of the data used, their origins and the datasets created, using models and architectures that can be easily documented and interpreted, making tests with different variables and groups of users and implementing ethical guidelines. A solution for GenAI models could be the development of open-source models. In fact, the use of open-source models allows for greater transparency on the origin of the data and how it is used, creating a safe legal route for companies and mitigating the associated risks.²⁸⁵

The objective of transparency cannot be achieved without an adequate regulatory framework. In this regard, the European Union adopted the AI Act in March 2024, the first official regulation relating to the development and use of this technology. The new rules establish obligations where AI can generate various types of risks; among these, the topic of transparency is also discussed. Transparency requirements force companies to document their use of algorithms, disclose when content is generated by AI, design models so they cannot produce illegal material,

²⁸⁴ Cf. Kamila/Jasrotia (2023) p. 10.

²⁸⁵ Cf. Banh/Strobel (2023) p. 8.

and provide information on the data used for training.²⁸⁶ The EU has also issued the Digital Service Act (DSA) with the aim of making the Internet a safer place for users and protecting online rights; algorithmic transparency and accountability are key parts of this protection.²⁸⁷

4.3 Bias and Discrimination

One of the gray areas that most creates perplexity regarding algorithms is bias and discrimination. The concern is that prejudices may be introduced into the operating mechanism of the algorithms which can lead to unfair and discriminatory decisions towards some individuals or groups. Although issues of bias and discrimination have long existed in societies and cultures, the worry now is that AI technology might not only sustain these issues but also amplify their effects.²⁸⁸ As seen in the previous chapter, ML algorithms are often black boxes, and it may be difficult to identify the factors that create such situations. This lack of transparency fuels the risk of perpetrating discrimination, especially in certain areas such as hiring, lending and law enforcement. For example, Amazon had to

²⁸⁶ Cf. European Parliament (2023) n.d. (online).

²⁸⁷ Cf. European Commission, n.d. (online).

²⁸⁸ Cf. Coeckelbergh (2019) p. 32.

abandon its tool for evaluating job applications because the AI-based algorithm discriminated against women.²⁸⁹ Another example regards Google Vision Cloud, a Computer Vision service: the system labeled an image of a dark-skinned individual holding a thermometer “gun” while a similar image with a light-skinned individual was labeled “electronic device”.²⁹⁰

Bias and discrimination in AI-based machines can arise because of multiple causes. The various causes can be grouped into two categories:

- Technical issues: the technical reasons are in turn divided into data bias and algorithmic bias.²⁹¹ Data bias refers to the low quality of dataset that are used for algorithm training. The way in which the datasets are chosen and the composition of the data within them can give rise to discrimination. The use of over-under representative, incorrectly labeled, and unbalanced datasets during training is a typical cause of bias in results; this process is often referred to as "GIGO" or Garbage In, Garbage Out. The problem is amplified by the fact that some prejudices are so integrated into society that uncovering them can be very difficult. For example, even

²⁸⁹ Cf. Davenport et al. (2020) p. 38.

²⁹⁰ Cf. Kayser-Bril (2020) n.d. (online).

²⁹¹ Cf. Banh/Strobel (2023) p.p. 7-8.

the language in which the data is written could lead to unfair situations, preferring native speakers in that language (e.g. job applications).²⁹²

Algorithmic bias does not depend on the training methods but arises during the use of the algorithm. In this case, biases can be the result of the model underlying the algorithm: black box models make it difficult sometimes to find the problem. Also, AI might not be able to distinguish between attributes that are acceptable to use and those that are not because they are programmed to make a decision by analyzing data in all possible ways.²⁹³

- Human-related issue: human actions can intentionally or unintentionally lead to discrimination. Inside this category we can find unprofessional behaviors and unethical actions during algorithm training, lack of knowledge of social science, little attention to fairness, and the composition of the developers group. For example, a prevalence of males in the development team can disadvantage the female gender by creating a model based on the male way of thinking.²⁹⁴

Bias and discrimination in digital marketing can produce negative results such as not being able to identify the right audience, reduce sales opportunities, worsen

²⁹² Cf. Coeckelbergh (2019) p. 32.

²⁹³ Cf. Davenport et al. (2020) p. 38.

²⁹⁴ Cf. Qian et al. (2024) p. 3.

economic results and risk suffering reputational crises. For example, the advertising algorithm can exclude some subjects from showing the message because they belong to a certain ethnic group. The answers provided by chatbots or the contents created by Generative AI could be offensive to some categories of individuals, resulting in a loss of customers, sales and a worsening of the brand image. Product recommendations can also cause harm to the company or be harmful to society. For example, e-commerce recommendation systems can fuel economic gaps between different segments of the population by recommending high-quality products to the richest and low-quality products to lower-income individuals.²⁹⁵

To address issues of bias and discrimination, especially from a technical standpoint, various measures can be implemented. It is crucial to focus on the development phases of algorithms to prevent, identify, and eliminate biases within the system. Beyond the sense of responsibility and professionalism on the part of the developers (which still remain essential elements for the design of a transparent algorithm), there are some approaches that can be adopted to facilitate this task. Banh and Strobel (2023) highlighted the importance of reinforcement learning from feedback by humans as a method to limit bias: “this approach enables generative models to refine their output generation process, aiming for

²⁹⁵ Cf. Kumar et al. (2024) p. 12.

better alignment with human expectations and objectives”.²⁹⁶ Addressing this problem for recommendation systems, Burke (2017) proposes viewing fairness as a multifaceted concept, identifying three types of fair recommendations:

- C-Fairness (Consumer Fairness): this focuses on the users or consumers, aiming to provide them the most relevant recommendations based on their interests and preferences.
- P-Fairness (Provider Fairness): this concerns the providers, ensuring that their products or services are fairly recommended to users who might be interested in them.
- CP-Fairness (Consumer-Provider Fairness): this combines both perspectives, striving to balance the interests of both users and providers to ensure fair recommendations that benefit all parties involved.²⁹⁷

This classification allows developers of recommendation systems to understand how the competing interests of various parties are influenced by the system's recommendations. Consequently, they can design system architectures that effectively balance and mediate between these interests. Evaluating the interests at stake and involving all parties in the development can also represent a solution for models other than recommendation systems.

²⁹⁶ Banh/Strobel (2023) p. 8.

²⁹⁷ Cf. Burke (2017) p.p. 3. f.

However, working on the technical aspects of algorithms is not enough, regardless of which approach or logic developers follow. The journey towards minimizing bias and discrimination must necessarily pass through a radical change in society and its mentality. Only by fostering a sense of justice in society and eliminating prejudice in the "real" world it will be possible to achieve significant results in technology.²⁹⁸

4.4 Fake news

With the diffusion of digital platform and especially social media, the proliferation of fake news has become an increasingly growing problem, with implications for society and individuals. In fact, there are more and more individuals or online newspapers that spread untrue or unconfirmed news, with the aim of attracting users' attention and obtaining likes and visibility.²⁹⁹

Defining "fake news" is not an easy task because of the ambiguity this term has gained in recent times. Moreover, recently, the term has also acquired a political meaning and is used not only for untruthful information but also to undermine the credibility of organizations or individuals who have a different thought than ours.

²⁹⁸ Cf. Coeckelbergh (2019) p. 32.

²⁹⁹ Cf. Raman et al. (2024) p. 1.

With the aim of clarifying the issue, Molina et al. (2021) proposed a taxonomy to identify different types of content that can fall within the scope of "fake news", such as false information, satire, misreporting and others. This classification is not based exclusively on the true/false binomial but includes a greater series of variables such as intentionality, reliability of sources and data manipulation.³⁰⁰ Even though fake news not always has an informative purpose, two concepts are embedded in it: misinformation and disinformation. The difference lies in the intent: disinformation is carried out voluntarily and with a malicious intent while misinformation derives from perceiving news as true even if it is not and proposing it without having a negative intent.³⁰¹

Artificial Intelligence has an ambivalent role on the issue. On the one hand, it has been widely demonstrated by various studies that Machine Learning tools can be a valid ally for recognizing fake news and classifying it as such. On the other hand, however, Deep Learning algorithms can be used to generate false content, thanks to recent advances in the field of Natural Language Processing and Computer Vision. In fact, these algorithms can leverage factors such as user demographics, topic relevance, and emotional appeal to create fake news articles that are likely to go viral and be shared on every platform. In particular, RNNs and Transformers

³⁰⁰ Cf. Molina et al. (2018) p.p. 184. f.

³⁰¹ Cf. Raman et al. (2024) p. 2.

models can mimic the tone and style of real news by learning the structure and the pattern of news articles.³⁰²

From an ethical point of view, the generation of fake news can have a negative impact on individuals and society. The first problem is related to the aforementioned misinformation and disinformation: false information can have an important role in shaping people's thinking and belief. This distortion of reality can lead to a strengthening of prejudices and biases, with a consequent increase in discrimination or can be exploited by individuals or groups in an important position for their own purposes which do not necessarily coincide with the social good. The worst consequences may concern social divisions, risks to public health and safety and the integrity of democracy in electoral processes.

The spread of fake news generated by Artificial Intelligence can have important consequences in terms of trust and reliability towards these systems. It is important that these systems are precise, objective, transparent and that they produce truthful information: only in this way will users be able to trust and will it be possible to implement this technology in many sectors, benefiting from the advantages it can bring.³⁰³

Finally, in the business context, fake news can give rise to various problems such as reputational and image damages, legal implications, economic damages,

³⁰² Cf. Trandabăţ/Gifu (2023) p. 3824.

³⁰³ Cf. Kamila/Jasrotia (2023) p. 11.

worsening of relationships with customers and so on. In this regard, Generative AI models that bring efficiency and effectiveness to businesses often suffer from the so-called phenomenon of “hallucinations”. Hallucinations refers to the tendency of GenAI algorithm to provide false information but with a high level of confidence. This process can produce outputs that deviate from reality and introduce untruthful information. If, for example, these tools are used by companies to create informative contents, there is a risk of obtaining the opposite effect, i.e. providing incorrect information and, consequently, also reputational damage. To mitigate the risk of hallucinations, in addition to the accuracy of the datasets used for training and technical improvements in the algorithm, it is essential to provide human supervision over the content generated to ensure quality and accuracy.³⁰⁴

Still in the field of Generative AI, a phenomenon that has spread widely is that of Deepfake, defined as “digitally manipulated synthetic media content (e.g., videos, images, sound clips) in which people are shown to do or say something that never existed or happened in the real world”.³⁰⁵ Deepfakes can represent a very important business tool for companies because they allow them to reduce costs for content generation, improve the virtual customer experience, help promote products and services, and generate new business opportunities. For example, the

³⁰⁴ Cf. Banh/Strobel (2023) p. 9.

³⁰⁵ Cf. Mustak et al. (2023) p. 1.

South Korean TV network MBN utilized a deepfake version of its news presenter, Kim Joo-Ha, and discovered that the deepfake was effective for delivering breaking news. However, Deepfakes can also raise ethical problems, including job losses across various sectors like media and entertainment; harm to the reputation, image, and trustworthiness of individuals, and organizations; disinformation and misinformation; unfair market competition; the manipulation of public opinion; and privacy invasion.³⁰⁶

Artificial Intelligence systems can be a good ally for identifying fake news, and therefore can act retrospectively only after the false information has been created. They are therefore useful when fake news is the result of a voluntary process by malicious individuals or groups. For example, the use of AI systems by social media platforms can be a good way to combat disinformation. With the goal of preventing their involuntary production, the measures that should be adopted are the same as those seen for the previous ethical problems. In fact, the generation of fake news can be seen as the result of the poor quality of the training datasets, of prejudices and biases inserted into the algorithm and of the lack of clarity of the processes with which the models elaborate the answers. Working on these factors consequently reduces the risk of fake news.

³⁰⁶ Cf. Mariani/Dwivedi (2024) p. 15.

CONCLUSION

The integration of Artificial Intelligence into digital marketing is reshaping the landscape in unprecedented ways, particularly through the advent of Generative AI, and it appears like a revolution for marketing, business and society. This thesis has explored the impact of AI in digital marketing, enhancing marketing strategies, improving efficiency, and created new avenues for customer engagement.

After defining AI and retracing its history, the various components and related models were analyzed identifying those that are having the greatest impact on digital marketing.

From the analysis of the relationship between digital marketing and AI it emerged that AI's ability to process vast amounts of data and generate insights allows for highly personalized marketing campaigns, which cater to individual customer preferences and behaviors. Furthermore, the integration of Generative AI into Content Marketing strategies has highlighted the great ability of this technology to produce efficiency and effectiveness in social media management. Computer Vision and Natural Language Processing play a very important role in this process.

The main applications of AI in digital marketing were analyzed demonstrating how these systems can improve the customer experience and the effectiveness of digital campaigns. The use of AI in CDPs expands the possibilities of

segmentation and targeting, promoting greater understanding of the customer and his needs. Chatbots and virtual assistants allow a significant improvement in the customer experience, strengthening sales and customer satisfaction. One of the main benefits of AI is the automation of processes, making them faster, more accurate and more effective. E-mail marketing, SEO and programmatic advertising particularly benefit from this automation, respectively in the process of planning and sending messages, in keywords research and analysis and in the automatic purchase and sale of advertising space.

The implications of AI in digital marketing have also been studied from a practical point of view, providing real case studies of companies that have streamlined their marketing processes with these machines achieving significant results. These practical cases have highlighted how several companies are implementing Generative AI for content creation, achieving viral campaigns all over the world and very significant conversion rates.

However, the adoption of AI in marketing is not without challenges. Ethical concerns, including data privacy and security, transparency, potential biases, and fake news must be addressed to ensure responsible use of AI technologies. The fear of AI surpassing human intelligence and taking control underscores the need for ongoing dialogue and regulation in AI development and requires a sense of responsibility from developers and businesses.

Future research on the topic can focus on a twofold direction. On the one hand, the increased adoption of AI in digital marketing that will occur in the coming years will offer the possibility to expand analysis on the impact of this technology for marketing objectives; in this sense, the influence of Generative AI on customer engagement is one of the areas that requires greater clarity. On the other hand, ethical issues will become increasingly crucial in society and the need will arise to identify responsible and ethical ways to use these systems.

In conclusion, while AI offers vast opportunities for innovation in digital marketing, it is crucial to balance technological advancements with ethical considerations. As AI continues to evolve, its impact on marketing will likely grow, requiring continuous adaptation and learning within the industry. This thesis contributes to understanding AI's role in digital marketing and highlights the importance of a strategic, ethical approach to leveraging AI for future success.

REFERENCES

- Ads of the World (ed.) (n.d.). Heinz AI Ketchup. URL: <https://www.adsoftheworld.com/campaigns/a-i-ketchup>. (as of 21 May 2024).
- Aggarwal, K. et al. (2022). Has the Future Started? The Current Growth of Artificial Intelligence, Machine Learning, and Deep Learning. In: Iraqi Journal for Computer Science and Mathematics, vol. 3 No. 1, p.p. 115-123, URL: <https://doi.org/10.52866/ijcsm.2022.01.01.013>. (Accessed 13 April 2024).
- Apple (ed.) (2017). Hey Siri: An On-device DNN-powered Voice Trigger for Apple's Personal Assistant. URL: <https://machinelearning.apple.com/research/hey-siri>. (as of 12 April 2024).
- Apriani, A/ Sani, I./Kurniawati, L./ Prayoga, R./Panggabean, H. L. (2024). The Role of Artificial Intelligence (AI) and its Benefits in Digital Marketing Strategy. In: East Asian Journal of Multidisciplinary Research (EAJMR) vol.3, No.1, p.p. 319-332. URL: <https://journal.formosapublisher.org/index.php/eajmr/article/view/8075>. (Accessed 14 April 2024).
- Araújo C./Soares C./Pereira I./Coelho D./Rebelo M. Â./Madureira A. (2022). A Novel Approach for Send Time Prediction on Email Marketing. Applied Sciences, vol. 12 (16), p.p. 1-13. URL: <https://doi.org/10.3390/app12168310>. (Accessed 15 May 2024).
- Banh, L./Strobel, G. (2023). Generative artificial intelligence. In: Electron Markets, vol. 33 (No. 63), p.p. 1-17. URL: <https://doi.org/10.1007/s12525-023-00680-1>. (Accessed 29 May 2024).
- Bernard, A. (2023). "AI in ecommerce: True one-on-one personalization is coming". URL: <https://www.cmswire.com/customer-experience/ai-in-ecommerce-true-one-on-one-personalization-is-coming/>. (as of 23 April 2024).
- Bhattarai, A. (2023). Exploring Customer Engagement through Generative AI Innovative Strategies in Digital Marketing Campaigns. In: Quarterly Journal of Emerging Technologies and Innovations, vol. 8, no. 12, p.p. 1-9. URL: <https://vectoral.org/index.php/QJETI/article/view/51>. (Accessed 25 April 2024).
- Bitkom (ed.) (2024). Künstliche Intelligenz im digitalen Marketing. URL: <https://www.bitkom.org/Bitkom/Publikationen/Kuenstliche-Intelligenz-im-digitalen-Marketing>. (Accessed 30 April 2024).
- Boddu, R. S. K./Santoki, A. A./Khurana, S./Koli, P. V./Rai, R./Agrawal, A. (2022). An analysis to understand the role of machine learning, robotics and artificial intelligence in digital marketing. In: Materials Today: Proceedings, vol. 56, part 4, p.p. 2288-2292. URL: <https://doi.org/10.1016/j.matpr.2021.11.637>. (Accessed 19 April 2024).
- BrightEdge (ed.) Meta Doubles Monthly Search Traffic with Help from Non-Branded Keyword Research. URL: <https://www.brightedge.com/resources/case-studies/meta-doubles-monthly-search-traffic>. (as of 19 May 2024).

- Brodie, R. J./Hollebeek, L. D./Jurić, B./Ilić, A. (2011). Customer engagement: Conceptual domain, fundamental propositions, and implications for research. In: *Journal of Service Research*, vol. 14, issue 3, p.p. 252–271. URL: <https://doi.org/10.1177/1094670511411703>. (Accessed 8 May 2024).
- Brüns, J. D./Meißner, M. (2024). Do you create your content yourself? Using generative artificial intelligence for social media content creation diminishes perceived brand authenticity. In: *Journal of Retailing and Consumer Services*, vol. 79, URL: <https://doi.org/10.1016/j.jretconser.2024.103790>. (Accessed 23 April 2024).
- Burke, R. (2017). Multisided Fairness for Recommendation. arXiv preprint. URL: <https://doi.org/10.48550/arXiv.1707.00093>. (Accessed 31 May 2024).
- Burnstein, D. (2022). Artificial Intelligence Case Studies: Two companies that boosted brand awareness with AI and another marketer that used humans instead. URL: <https://www.marketingsherpa.com/article/case-study/artificial-intelligence>. (as of 21 May 2024).
- Busch, O. (2016). *Programmatic Advertising: The Successful Transformation to Automated, Data-Driven Marketing in Real-Time*. Springer (ed.) Hamburg, Germany.
- Cambridge Dictionary (e.d.) (n.d.). keyword: intelligence, URL: <https://dictionary.cambridge.org/dictionary/english/intelligence>. (as of 12 April 12, 2024).
- Camilleri, M. A. (2020). The use of data-driven technologies for customer-centric marketing. In: *International Journal of Big Data Management*, Vol. 1, No. 1, p.p. 50-63. URL: <https://doi.org/10.1504/IJBDM.2020.106876>. (Accessed 15 April 2024).
- Cao, Y./Li, S./Liu, Y./Yan, Z./Dai, Y./Yu, P.S./Sun, L. (2023). A Comprehensive Survey of AI-Generated Content (AIGC): A History of Generative AI from GAN to ChatGPT. ArXiv, abs/2303.04226, URL: <https://doi.org/10.48550/arXiv.2303.04226>. (Accessed 15 April 2024).
- Carmody, J./Shringarpure, S./Van de Venter, G. (2021). AI and privacy concerns: a smart meter case study. In: *Journal of Information, Communication and Ethics in Society*, vol. 19, No. 4, p.p. 492-505. URL: <https://doi.org/10.1108/JICES-04-2021-0042>. (Accessed 23 May 2024).
- Cavlak, N./Cop, R. (2021). The Role of Big Data in Digital Marketing. In: J. Saura (Ed.), *Advanced Digital Marketing Strategies in a Data-Driven Era*, IGI Global, p.p. 16-33. URL: <https://doi.org/10.4018/978-1-7998-8003-5.ch002>. (Accessed 16 April 2024).
- CDP Institute (ed.) (2020). *Artificial Intelligence in Customer Data Platforms*. URL: <https://www.cdpinstitute.org/resources/artificial-intelligence-in-customer-data-platforms/>. (Accessed 29 April 2024).
- Chahal, A./Gulia, P. (2019). Machine Learning and Deep Learning. In: *International Journal of Innovative Technology and Exploring Engineering*, vol. 8 (issue 12), p.p. 4910-4914. URL: <http://dx.doi.org/10.35940/ijitee.L3550.1081219>. (Accessed 14 April 2024).
- Choi, G./Kim, J. (2024). Assessing the Impact of Generative Artificial Intelligence on Customer Engagement in Business-to-Customer Scenarios. In: *Asia-Pacific Journal of Convergent Research Interchange* vol.10, No.2, p.p. 89-104. URL: <http://apjcriweb.org/content/vol10no2/9.pdf>. (Accessed 25 April 2024).

Coeckelbergh, M. (2019). Artificial Intelligence: Some ethical issues and regulatory challenges. In: Technology and Regulation, p.p. 31-34. URL: <https://doi.org/10.26116/techreg.2019.003>. (Accessed 27 May 2024).

Content Marketing Institute (ed.) (n.d.). What exactly is Content Marketing? URL: <https://contentmarketinginstitute.com/getting-started/>. (as of 21 April 2024).

Davenport, T./Guha, A./Grewal, D./Bressgott, T. (2020). How artificial intelligence will change the future of marketing. In: Journal of the Academy of Marketing Science, vol. 48, p.p. 24–42. URL: <https://doi.org/10.1007/s11747-019-00696-0>. (Accessed 12 April 2024).

Davis S. (2023). Programmatic Advertising Trends, Stats, & News. URL: <https://roirevolution.com/blog/programmatic-advertising-trends-stats-news/>. (as of 10 May 2024).

Decker, A. (2020). What's a Customer Data Platform? The Ultimate Guide to CDPs. HubSpot (ed.). URL: <https://blog.hubspot.com/service/customer-data-platform-guide>. (as of 29 April 2024).

Deloitte (ed.) (n.d.). Connecting with meaning: Hyper-personalizing the customer experience using data, analytics, and AI. URL: <https://www2.deloitte.com/ca/en/pages/deloitte-analytics/articles/connecting-with-meaning.html>. (as of 17 April 2024).

De Mol L., (2021). Turing Machines. In: The Stanford Encyclopedia of Philosophy (Winter 2021 Edition), Edward N. Zalta (ed.), URL: <https://plato.stanford.edu/archives/win2021/entries/turing-machine/>. (Accessed 12 April 2024).

Dencheva, V. (2023). Effectiveness of artificial intelligence (AI) in email marketing in Europe and in the United States as of August 2023. Statista (ed.). URL: <https://www.statista.com/statistics/1406430/ai-effectiveness-email-marketing/>. (as of 14 May 2024).

Deng, O. (2022). What is a Persona?: Everything You Need to Know. HubSpot (ed.) URL: <https://blog.hubspot.com/marketing/what-is-persona>. (as of 29 April 2024).

Deveau, R./Griffin, S. J./Reis, S. (2023). AI-powered marketing and sales reach new heights with generative AI. McKinsey & Company (ed.) URL: <https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/ai-powered-marketing-and-sales-reach-new-heights-with-generative-ai/>. (as of 20 April 2024).

Dewatmoko, S./Sonani, N./Sudrajat, A. P. (2024). Voice Search SEO: Optimizing Marketing Strategies for the Future. In: Management Studies and Entrepreneurship Journal (MSEJ), vol. 5 (No 2), p.p. 5054–5061. URL: <https://doi.org/10.37385/msej.v5i2.4930>. (Accessed 18 May 2024).

Deyi Li/Yi Du, (2017). Artificial Intelligence with Uncertainty. 2nd Edition. Boca Raton, USA: CRC Press, Taylor and Francis Group.

Dobrev D. (2005). A Definition of Artificial Intelligence. In: Mathematica Balkanica, New Series, vol. 19, Fasc. 1-2, pp.67-74. URL: <https://doi.org/10.48550/arXiv.1210.1568>. (Accessed 12 April 2024).

- Dolan, R./Conduit, J./Frethey-Bentham, C./Fahy, J./Goodman, S. (2019). Social media engagement behavior: A framework for engaging customers through social media content. In: *European Journal of Marketing*, vol. 53, No. 10, p.p. 2213-2243. URL: <http://dx.doi.org/10.1108/EJM-03-2017-0182>. (Accessed 22 April 2024).
- Donepudi, P. K. (2014). Voice Search Technology: An Overview. In: *Engineering International*, vol. 2 (No 2), p.p. 91–102. URL: <https://doi.org/10.18034/ei.v2i2.50>. (Accessed 18 May 2024).
- Dumitriu, D./Popescu, M. A.-M. (2020). Artificial Intelligence Solutions for Digital Marketing In: *Procedia Manufacturing*, vol. 46, p.p. 630-636. URL: <https://doi.org/10.1016/j.promfg.2020.03.090>. (Accessed 16 May 2024).
- European Commission (n.d.) (ed.). European Centre for Algorithmic Transparency. URL: https://algorithmic-transparency.ec.europa.eu/index_en. (as of 29 May 2024).
- European Parliament (ed.) (2023). EU AI Act: first regulation on artificial intelligence. URL: <https://www.europarl.europa.eu/topics/en/article/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence>. (as of 29 May 2024).
- European Parliament (ed.) (2020). The impact of the General Data Protection Regulation (GDPR) on artificial intelligence. Panel for the Future of Science and Technology (STOA), URL: [https://www.europarl.europa.eu/thinktank/en/document/EPRS_STU\(2020\)641530](https://www.europarl.europa.eu/thinktank/en/document/EPRS_STU(2020)641530). (as of 25 May 2024).
- Eyada, B./Ahmed, N. (2022). Effectiveness of CHATBOT Advertising on Consumer Buying Decision: An Analytical Study. In: *Journal of Design Sciences and Applied Arts*, vol. 3, issue 2, p.p. 74-87. URL: <https://dx.doi.org/10.21608/jdsaa.2022.121166.1158>. (Accessed 5 May 2024).
- Feng, C. M./Botha, E./Pitt L. (2024). From HAL to GenAI: Optimize chatbot impacts with CARE. In: *Business Horizons*, p.p. 0-29. URL: <https://doi.org/10.1016/j.bushor.2024.04.012>. (Accessed 3 May 2024).
- Flinders, M. (2023). AI in marketing: How to leverage this powerful new technology for your next campaign. IBM (ed.) URL: <https://www.ibm.com/blog/ai-in-marketing/>. (as of 19 April 2024).
- García-Peñalvo, F. J./Vázquez-Ingelmo, A. (2023). What do we mean by GenAI? A systematic mapping of the evolution, trends, and techniques involved in Generative AI. In: *International Journal of Interactive Multimedia and Artificial Intelligence*, vol. 8, no. 4, p.p. 7-16, URL: 10.9781/ijimai.2023.07.006. (Accessed 14 April 2024).
- Garnham A. (2017). *Artificial Intelligence: an introduction*. 1st Edition. London. Routledge, Taylor and Francis Group. URL: <https://doi.org/10.4324/9780203704394>. (Accessed 12 April 2024).
- Gazziero, C. (2021). *Intelligenza artificiale applicata al marketing digitale: implicazioni etiche dei recommendation systems*. Tesi di laurea, Università degli studi di Padova. URL: <https://hdl.handle.net/20.500.12608/10321>.
- Gottfredson, L. S. (1997). Mainstream science on intelligence: An editorial with 52 signatories, history, and bibliography. In: *Intelligence*, vol. 24 (issue 1), p.p. 13-23, URL: [https://doi.org/10.1016/S0160-2896\(97\)90011-8](https://doi.org/10.1016/S0160-2896(97)90011-8). (Accessed on 13 April 2024).

Gregori, G. L./Pascucci, F. (2019). Il digital marketing come fattore competitivo: verso un approccio integrato “strumenti” e “strategia”. Franco Angeli, Milano.

Grzybowski, A./Pawlikowska-Łagód, K./W. Clark, L., (2024). A History of Artificial Intelligence. In: Clinics in Dermatology. URL: <https://doi.org/10.1016/j.clindermatol.2023.12.016>. (Accessed 12 April 2024).

Ha, N. T. (2022). Application of AI and Machine Learning in Search Engine Optimization. In: Proceedings of the 3rd International Conference on Science, Technology and Society Studies, p.p. 397-403. URL: file:///C:/Users/pierl/Downloads/InternationalConferenceOnScienceTechnologyandSocietyStudies STS_2022.pdf. (Accessed 17 May 2024).

Haenlein, M./Kaplan, A. (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. In: California management review, vol. 61 (issue 4), p.p. 5-14. URL: <http://dx.doi.org/10.1177/0008125619864925>. (Accessed 12 April 2024).

Haleem, A./Javaid, M./Qadri, M.A./Singh, R.P./Suman, R. (2022). Artificial intelligence (AI) applications for marketing: A literature-based study. In: International Journal of Intelligent Networks, vol. 3, p.p. 119–132. URL: <https://doi.org/10.1016/j.ijin.2022.08.005>. (Accessed 12 April 2024).

Hariri, W. (2023). Unlocking the Potential of ChatGPT: A Comprehensive Exploration of Its Applications, Advantages, Limitations, and Future Directions in Natural Language Processing. ArXiv Preprint, ArXiv:2304.02017. URL: <https://doi.org/10.48550/arXiv.2304.02017>. (Accessed 15 April 2024).

Huang, T. K./Liao, C. Y./Wang, Y. T./Lin, K. Y. (2018). How does social media interactivity affect brand loyalty? In: Proceedings of the 51st Hawaii International Conference on System Sciences. p.p. 2130-2139. URL: <http://hdl.handle.net/10125/50154>. (Accessed 23 April 2024).

IBM (ed.), (2024). What is generative AI?. URL: <https://www.ibm.com/topics/generative-ai>. (as of 15 April 2024).

Islam, M.S./Kabir, M.N./Ghani, N.A. et al. (2024). Challenges and future in deep learning for sentiment analysis: a comprehensive review and a proposed novel hybrid approach. In: Artificial Intelligence Review, vol. 57, no. 62. URL: <https://doi.org/10.1007/s10462-023-10651-9>. (Accessed 1 May 2024).

Jasper (ed.). FAQ Schema Generator: Powered by AI. URL: <https://www.jasper.ai/tools/faq-schema-generator>. (as of 17 May 2024).

Kamila, M.K./Jasrotia, S.S. (2023). Ethical issues in the development of artificial intelligence: recognizing the risks. In: International Journal of Ethics and Systems, vol. ahead-of-print No. ahead-of-print, p.p. 1-19. URL: <https://doi.org/10.1108/IJOES-05-2023-0107>. (Accessed 23 May 2024).

- Kannan, P. K./Li, H. A. (2017). Digital marketing: A framework, review and research agenda. In: International Journal of Research in Marketing, vol. 34, (issue 1), p.p. 22-45, URL: <https://doi.org/10.1016/j.ijresmar.2016.11.006>. (Accessed 15 April 2024).
- Kaput, M. (2024). What Is Artificial Intelligence for Social Media?. Marketing AI Institute (ed.). URL: <https://www.marketingaiinstitute.com/blog/what-is-artificial-intelligence-for-social-media>. (as of 29 April 2024).
- Kaput, M. (2022). Artificial Intelligence in Email Marketing. Marketing AI Institute (ed.). URL: <https://www.marketingaiinstitute.com/blog/ai-in-email-marketing>. (as of 14 May 2024).
- Kayser-Bril, N. (2020). Google apologizes after its Vision AI produced racist results. AlgorithmWatch (ed.). URL: <https://algorithmwatch.org/en/google-vision-racism/>. (as of 29 May 2024).
- Kee, A. W./Yazdanifard, R. (2015). The Review of Content Marketing as a New Trend in Marketing Practices. In: International Journal of Management, Accounting and Economics, vol 2 no. 9, p.p. 1055-1064. URL: https://www.ijmae.com/article_117711_dc42b2a79c476474739e72266238c6ba.pdf. (Accessed 21 April 2024).
- KPMG (ed.), (2016). Seeking customer centricity. URL: <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/06/TOMS-seeking-customer-centricity-the-omni-business-model01.pdf> (as of 19 April 2024).
- Kshetri, N./Dwivedi, Y. K./Davenport, T. H./Panteli, N. (2024). Generative artificial intelligence in marketing: Applications, opportunities, challenges, and research agenda. In: International Journal of Information Management, vol. 75, URL: <https://doi.org/10.1016/j.ijinfomgt.2023.102716>. (Accessed 15 April 2024).
- Kumar, V./Ashraf, A. R./Nadeem, W. (2024). AI-powered marketing: What, where, and how?. In: International Journal of Information Management, URL: <https://doi.org/10.1016/j.ijinfomgt.2024.102783>. (Accessed 19 April 2024).
- Lee, S. B. (2020). Chatbots and Communication: The Growing Role of Artificial Intelligence in Addressing and Shaping Customer Needs. In: Business Communication Research and Practice 2020;3(2), p.p. 103-111. URL: <https://doi.org/10.22682/bcrp.2020.3.2.103>. (Accessed 5 May 2024).
- Lemon, K. N./Verhoef, P. C. (2016). Understanding Customer Experience Throughout the Customer Journey. In: Journal of Marketing, 2016, vol. 80, p.p. 69 - 96, URL: <https://api.semanticscholar.org/CorpusID:168279405>. (Accessed 15 April 2024).
- Liu, B. (2021). "Weak AI" is Likely to Never Become "Strong AI", So What is its Greatest Value for us?. arXiv preprint arXiv:2103.15294. URL: <https://doi.org/10.48550/arXiv.2103.15294>. (Accessed 13 April 2024).
- Liu, Y./Yang, Z./Yu, Z./.../Shi, S. (2023). Generative artificial intelligence and its applications in materials science: Current situation and future perspectives. In: Journal of Materiomics, vol. 9 (Issue 4), p.p. 798-816, URL: <https://doi.org/10.1016/j.jmat.2023.05.001>. (Accessed 15 April 2024).

Lou, C./Xie, Q. (2021). Something social, something entertaining? How digital content marketing augments consumer experience and brand loyalty. In: International Journal of Advertising, vol. 40 (issue 3), p.p. 376–402. URL: <https://doi.org/10.1080/02650487.2020.1788311>. (Accessed 21 April 2024).

LVMH (ed.) (n.d.). Sephora. URL: <https://www.lvmh.it/le-maison/distribuzione-selettiva/sephora/#:~:text=La%20Maison%20Sephora%20%C3%A8%20presente,pi%C3%B9%20di%202600%20punti%20vendita>. (as of 5 May 2024).

Mailchimp (a) (ed.) (n.d.). AI Predictive Analytics: The Key to Unlocking Business Insights. URL: <https://mailchimp.com/resources/ai-predictive-analytics/>. (as of 1 May 2024).

Mailchimp (b) (ed.) (n.d.). Come l'AI può trasformare il tuo e-mail marketing. URL: <https://mailchimp.com/it/resources/ai-email-marketing/>. (as of 14 May 2024).

Malesević, V./Kojić, N./Savić, A. (2014). Market Segmentation and Targeting Based On Artificial Intelligence. In: International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, vol. 3, issue 12, p.p. 13461-13477. URL: https://www.ijareeie.com/upload/2014/december/2_Market_HARDCOPY.pdf. (Accessed 29 April 2024).

Mandapuram, M./Gutlapalli, S. S./Reddy, M./Bodepudi, A. (2020). Application of Artificial Intelligence (AI) Technologies to Accelerate Market Segmentation. In: Global Disclosure of Economics and Business, vol. 9, no 2, p.p. 141-150. URL: <https://doi.org/10.18034/gdeb.v9i2.662>. (Accessed 29 April 2024).

Mariani, M./Dwivedi, Y. K. (2024). Generative artificial intelligence in innovation management: A preview of future research developments. In: Journal of Business Research, vol. 175, URL: <https://doi.org/10.1016/j.jbusres.2024.114542>. (Accessed 15 April 2024).

Martinez, R. (2019). Artificial Intelligence: distinguish between types & definitions. In: Nevada Law Journal, vol. 19 (issue 3), p.p. 1015-1042. URL: <https://scholars.law.unlv.edu/nlj/vol19/iss3/9>. (Accessed 13 April 2024).

McKinsey & Company (ed.), (2023). The economic potential of generative AI: The next productivity frontier. URL: <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-economic-potential-of-generative-AI-the-next-productivity-frontier#business-and-society>. (as of 20 April 2024).

Mei, Q./Xie, Y./Yuan, W./Jackson, M. O., (2024). A Turing test of whether AI chatbots are behaviorally similar to humans. In: Proceeding of the National Academy of Science, vol. 121 No. 9, URL: <https://doi.org/10.1073/pnas.2313925121>. (Accessed 13 April 2024).

Mijwel M.M. (2015). History of artificial intelligence. In: Computer Science, p.p. 1-6. URL: <http://dx.doi.org/10.13140/RG.2.2.16418.15046>. (Accessed 12 April 2024).

Milano, S./Taddeo, M./Floridi, L. (2020). Recommender systems and their ethical challenges. In: AI & Society, vol. 35, p.p. 957-967. URL: <https://doi.org/10.1007/s00146-020-00950-y>. (Accessed 25 May 2024).

- Miller, B. (2023). How to Use AI to Transform Your Email Marketing. Salesforce (ed.). URL: <https://www.salesforce.com/blog/ai-email-marketing/>. (as of 14 May 2024).
- Ming-Hui, H./Rust, R. T. (2021). A strategic framework for artificial intelligence in marketing. In: Journal of the Academy of Marketing Science, vol. 49, p.p.30–50. URL: <https://doi.org/10.1007/s11747-020-00749-9>. (Accessed 12 April 2024).
- Molina, M. D./Sundar, S. S./Le, T./Lee, D. (2021). “Fake News” Is Not Simply False Information: A Concept Explication and Taxonomy of Online Content. In: American Behavioral Scientist, vol. 65, issue 2, p.p. 180-212. URL: <https://doi.org/10.1177/0002764219878224>. (Accessed 2 June 2024).
- Moradi, M./Dass, M. (2022). Applications of artificial intelligence in B2B marketing: challenges and future directions. In: Industrial Marketing Management, vol. 107, p.p. 300-314. URL: <https://doi.org/10.1016/j.indmarman.2022.10.016>. (Accessed 3 May 2024).
- Mukhopadhyay, S./Singh, R. K./Jain, T. (2024) Developing big data enabled Marketing 4.0 framework. In: International Journal of Information Management Data Insights, vol. 4, Issue 1, p.p. 1-11. URL: <https://doi.org/10.1016/j.ijime.2024.100214>. (Accessed 8 May 2024).
- Mustak, M./Salminen, J./Mäntymäki, M./Rahman, A./Dwivedi, Y. K. (2023). Deepfakes: Deceptions, mitigations, and opportunities. In: Journal of Business Research, vol. 154, URL: <https://doi.org/10.1016/j.jbusres.2022.113368>. (Accessed 3 June 2024).
- Nanne, A. J./Antheunis, M. L./ van der Lee, C. G./Postma, E. O./ Wubben, S./van Noort, G. (2020). The use of computer vision to analyze brand-related user generated image content. In: Journal of Interactive Marketing, vol. 50, p.p. 156-167. URL: <https://doi.org/10.1016/j.intmar.2019.09.003>. (Accessed 14 April 2024).
- Netflix (ed.) (n.d.). How Netflix’s Recommendations System Works. URL: <https://help.netflix.com/en/node/100639#:~:text=We%20estimate%20the%20likelihood%20that,preferences%20on%20our%20service%2C%20and>. (as of 12 April 2024).
- Nobile, T. H./Cantoni, L. (2023). Personalization (In)effectiveness in email marketing. In: Digital Business, vol. 3, issue 2, p.p. 1-10. URL: <https://doi.org/10.1016/j.digbus.2023.100058>. (Accessed 13 May 2024).
- Ongsulee P. (2017). Artificial Intelligence, Machine Learning and Deep Learning”. Fifteenth International Conference on ICT and Knowledge Engineering (ICT&KE), Bangkok, Thailand, pp. 1-6, URL: <https://doi.org/10.1109/ICTKE.2017.8259629>. (Accessed 14 April 2024).
- OpenAI (e.d.) (2022). Introducing ChatGPT. URL: <https://openai.com/blog/chatgpt>. (as of 13 April 2024).
- OpenAI. (2024, April 14). [ChatGPT's response to a prompt about examples of differences between transformer architecture and RNN]. URL: <https://chat.openai.com/share/6b97e9bc-65a6-4e88-b7f7-958111cb3ff3>.

- Oxford English Dictionary (e.d.) (n.d.). keyword: artificial, URL: <https://www.oed.com/search/dictionary/?scope=Entries&q=artificial>. (Accessed: 12 April 12, 2024).
- Palmer, M. (2006). Data is the new oil. ANA Marketing Maestros [blog]. URL: https://ana.blogs.com/maestros/2006/11/data_is_the_new.html. (as of 16 April 2024).
- Pascucci, F./Savelli, E./Gistri, G. (2023). How digital technologies reshape marketing: evidence from a qualitative investigation. In: Italian Journal of Marketing, p.p. 27–58. URL: <https://doi.org/10.1007/s43039-023-00063-6>. (Accessed 15 April 2024).
- Piñeiro-Otero, T./Martínez-Rolán, X. (2016). Understanding Digital Marketing—Basics and Actions. In: Machado, C., Davim, J. (eds) MBA. Management and Industrial Engineering. Springer, Cham. p.p. 37-74. URL: https://doi.org/10.1007/978-3-319-28281-7_2. (Accessed 15 April 2024).
- Pohl, J. (2015). Artificial superintelligence: Extinction or Nirvana?. Proceedings of InterSymp-2015, 27th International Conference on Systems Research, Informatics, and Cybernetics (IIAS), Germany: Baden Baden, p.p. 1-19. URL: https://digitalcommons.calpoly.edu/arch_fac/82. (Accessed on 13 April 2024).
- Priya, B./ Nandhini, J.M./ Gnanasekaran, T. (2021). An Analysis of the Applications of Natural Language Processing in Various Sectors. In: Smart Intelligent Computing and Communication Technology, IOS Press, vol. 38, p.p. 598-602 URL: 10.3233/APC210109.
- Pukas, A., (2022). Hyper-Personalization as a Customer Relationship Management Tool in a SMART Organization. European Management Studies (previously: problemy zarządzania - management issues), vol. 20, no. 3(97), p.p. 95-108. URL: <https://doi.org/10.7172/1644-9584.97.5>. (Accessed 17 April 2024).
- Qian, Y./Siau, K. L./Nah, F. F. (2024). Societal impacts of artificial intelligence: Ethical, legal, and governance issues. In: Societal Impacts, vol. 3, URL: <https://doi.org/10.1016/j.socimp.2024.100040>. (Accessed 30 May 2024).
- Qin, X./Jiang, Z. (2019). The Impact of AI on the Advertising Process: The Chinese Experience. In: Journal of Advertising, vol. 48, issue 4, p.p. 338-346, URL: <https://doi.org/10.1080/00913367.2019.1652122>. (Accessed 12 May 2024).
- Rajamannar, R. (2023). The Mastercard Digital Engine™: Using AI to Spot Micro Trends for Effective Customer Engagement. Management and Business Review (ed.). URL: <https://mbrjournal.com/2023/07/25/the-mastercard-digital-engine-using-ai-to-spot-micro-trends-for-effective-customer-engagement/>. (as of 1 May 2024).
- Raman, R./Nair, V. K./Nedungadi, P./.../Achuthan, K. (2024). Fake news research trends, linkages to generative artificial intelligence and sustainable development goals. In: Heliyon, vol. 10, issue 3. URL: <https://doi.org/10.1016/j.heliyon.2024.e24727>. (Accessed 1 June 2024).
- Rasa.io (ed.). AMA Case Study: Marketers Using AI-Powered Newsletters. URL: <https://rasa.io/pushing-send/americanmarketingassociation/>. (as of 15 May 2024).

- Rathore, B. (2016). Usage of AI-Powered Marketing to Advance SEO Strategies for Optimal Search Engine Rankings. In: International Peer Reviewed/Refereed Multidisciplinary Journal (EIPRMJ), vol. 5, Issue 1, p.p. 30-35. URL: <https://www.eduzonejournal.com/index.php/eiprmj/article/view/300>. (Accessed 16 May 2024).
- Reilly, A./Depa, J./Douglass, G. (2019). AI: Built to scale, from experimental to exponential. Accenture (ed.). URL: <https://www.accenture.com/content/dam/accenture/final/a-com-migration/thought-leadership-assets/accenture-built-to-scale-pdf-report.pdf>. (as of 20 April 2024).
- Ribeiro, T./Reis, J. L. (2020). Artificial Intelligence Applied to Digital Marketing. In: Trends and Innovations in Information Systems and Technologies, WorldCIST 2020, p.p. 158-169. URL: https://doi.org/10.1007/978-3-030-45691-7_15. (Accessed 19 April 2024).
- Riley, H. (2023). Introduction to Programmatic Advertising. URL: <https://www.outbrain.com/blog/programmatic-advertising/>. (as of 10 May 2024).
- Sadiku, M. N. O./Ashaolu, T. J./Ajayi-Majebi, A./Musa S. M. (2021). Artificial Intelligence in Social Media. In: International Journal of Scientific Advances, vol. 2, issue 1, p.p. 15-20. URL: <http://dx.doi.org/10.51542/ijscia.v2i1.4>. (Accessed 20 May 2024).
- Santiago, E. (2024). Email Marketing: The Ultimate Guide (Expert Tips + Data to Know). HubSpot (ed.). URL: <https://blog.hubspot.com/marketing/email-marketing-guide>. (as of 13 May 2024).
- SEMrush (ed.) (2023). A Beginner's Guide to AI SEO. URL: [https://www.semrush.com/blog/ai-seo/#5-key-ways-to-apply-ai-seo-\(other-than-content-creation\)](https://www.semrush.com/blog/ai-seo/#5-key-ways-to-apply-ai-seo-(other-than-content-creation)). (as of 16 May 2024).
- SentiSquare (ed.) (n.d.). T-Mobile's Customer Satisfaction Boost with SentiSquare AI. URL: <https://www.sentisquare.com/en/success-stories-en/customer-feedback-analytics-at-t-mobile>. (as of 1 May 2024).
- Shin, D. (2020). User Perceptions of Algorithmic Decisions in the Personalized AI System: Perceptual Evaluation of Fairness, Accountability, Transparency, and Explainability. In: Journal of Broadcasting & Electronic Media, vo. 64, issue 4, p.p. 541-565. URL: <https://doi.org/10.1080/08838151.2020.1843357>. (Accessed 27 May 2024).
- Slater, D. (n.d.). The imperatives of customer-centric innovation. Amazon (ed.) URL: <https://aws.amazon.com/executive-insights/content/the-imperatives-of-customer-centric-innovation/>. (as of 19 April 2024).
- Srivastava, S. (2023). Harnessing the Power of AI Sentiment Analysis – 10 Benefits and Use Cases for Businesses. Appinventiv (ed.). URL: <https://appinventiv.com/blog/ai-sentiment-analysis-in-business/>. (as of 1 May 2024).
- Starri M. (2023). Digital 2023 – I dati globali. We are social. URL: <https://wearesocial.com/it/blog/2023/01/digital-2023-i-dati-globali/>. (Accessed 15 April 2024).
- Statista (ed.) (2014). Global programmatic advertising spending from 2017 to 2028(in billion U.S. dollars). URL: <https://www.statista.com/statistics/275806/programmatic-spending-worldwide/>. (as of 10 May 2024).

Taherdoost, H./Madanchian, M. (2023). Artificial Intelligence and Sentiment Analysis: A Review in Competitive Research. In: Computers, vol. 12, issue 2. URL: <https://doi.org/10.3390/computers12020037>. (Accessed 30 April 2024).

The Conference Board (2023). Survey: AI Usage for Marketers and Communicators. URL: <https://www.conference-board.org/topics/AI-for-business/press/AI-in-marketing-and-communications>. (as of 21 April 2024).

Trandabăț, D./Gifu, D. (2023). Discriminating AI-generated Fake News. In: Procedia Computer Science, vol. 225, p.p. 3822-3831. URL: <https://doi.org/10.1016/j.procs.2023.10.378>. (Accessed 2 June 2024).

Tucker, C. (2018). Privacy, Algorithms, and Artificial Intelligence. In: The Economics of Artificial Intelligence: An Agenda. University of Chicago Press, p.p. 423-437.

Vaswani, A./Shazeer, N./Parmar, N./.../Polosukhin I. (2017). Attention is all you need. Advances in Neural Information Processing Systems, 30. URL: <https://proceedings.neurips.cc/paper/7181-attention-is-all>. (Accessed 15 April 2024).

Verma, R. K./Kumari, N. (2023). Generative AI as a Tool for Enhancing Customer Relationship Management Automation and Personalization Techniques. In: International Journal of Responsible Artificial Intelligence, vol. 13, no. 9, p.p. 1-8. URL: <https://neuralslate.com/index.php/Journal-of-Responsible-AI/article/view/66>. (Accessed 24 April 2024).

Verma, S./Sharma, R./Deb, S./Maitra, D. (2021). Artificial intelligence in marketing: Systematic review and future research direction. In: International Journal of Information Management Data Insights, vol. 1 (issue 1). URL: <https://doi.org/10.1016/j.jjime.2020.100002>. (Accessed 17 April 2024).

VincosBlog (ed.) (2024). Come le aziende usano l'intelligenza artificiale generativa nella comunicazione. URL: <https://vincos.it/2024/05/08/aziende-ia-generativa-nella-comunicazione/>. (as of 21 May 2024).

Wahid, R./Mero, J./Ritala, P. (2023). Editorial: Written by ChatGPT, illustrated by Midjourney: generative AI for content marketing. In: Asia Pacific Journal of Marketing and Logistics, vol. 35 no. 8, p.p. 1813-1822. URL: <https://doi.org/10.1108/APJML-10-2023-994>. (Accessed 23 April 2024).

Wang, A. (2021). Sephora and It's "Beautybots". Medium (ed.). URL: <https://medium.com/marketing-in-the-age-of-digital/sophora-and-its-beautybots-f5d591fd5435>. (as of 5 May 2024).

Wang, W./Siau, K. (2019). Artificial Intelligence, Machine Learning, Automation, Robotics, Future of Work and Future of Humanity: A Review and Research Agenda. In: Journal of Database Management (JDM), vol. 30 (issue 1), p.p. 61-79. URL: <http://doi.org/10.4018/JDM.2019010104>. (Accessed 13 April 2024).

Yalçın, N./Köse U. (2010). What is search engine optimization: SEO?. In: Procedia Social and Behavioral Sciences, vol. 9, p.p. 487-493. URL: <https://doi.org/10.1016/j.sbspro.2010.12.185>. (Accessed 16 May 2024).

Yltävä, L. (2023). E-commerce net sales of sephora.com from 2016 to 2022. Statista (ed.). URL: <https://www.statista.com/forecasts/1383797/sephora-revenue-development-ecommercedb>. (as of 5 May 2024).

Zemčík, M. T. (2019). A brief history of chatbots. In: DEStech Transactions on Computer Science and Engineering, URL: <http://dx.doi.org/10.12783/dtcse/aicae2019/31439>. (Accessed 12 April 2024).

Zhu, Y. Q./Corbett, J. U./Chiu, Y. T. (2021). Understanding employees' responses to artificial intelligence. In: Organizational Dynamics, vol. 50 (issue 2), URL: <https://doi.org/10.1016/j.orgdyn.2020.100786>. (Accessed 13 April 2024).

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