

UNIVERSITY OF TARTU
Institute of Computer Science
Computer Science Curriculum

Danijel Golubovic
How AI is used in Digital Marketing

Master's Thesis (20 ECTS)

Supervisor: Fredrik Payman Milani, PhD

Tartu 2021

Table of Contents

1. Introduction	1
1.1. Research Questions	2
2. Background	4
2.1. Digital Marketing	4
2.2. Artificial Intelligence	7
3. Related Work	10
3.1. Digital Marketing	10
3.2. Artificial Intelligence	10
4. Grey Literature Review Protocol	12
4.1. Research Methodology	12
4.1.1 Planning of Grey Literature Review	12
4.1.2. Motivation for Review	12
4.1.3. Research Questions	13
4.2. Search Strategy	13
4.2.1. Search String	13
4.2.2. Search sources	14
4.3. Selection Criteria (Relevance)	14
4.4. Screening Procedure	15
4.5. Data Extraction Strategy	17
4.5.1. Data Extraction Form	17
4.5.2. Data Synthesis and Reporting	19
5. Results	20
5.1. RQ1: Which approaches of AI are used in Digital Marketing?	20
5.2. RQ2: What aspects or phases of Digital Marketing are impacted using AI?	23
5.3. RQ3: How is AI changing the Digital Marketing processes?	26
6. Discussion	36
6.1. The summary of results	40
6.2. Limitations of the Study	42
7. Conclusion	43
References	44
Appendix	53
I. Search strings formulation	53
II. License	56

How AI is used in Digital Marketing

Abstract:

There is a recognized need for Artificial Intelligence and Digital Marketing, and their popularity has been noticed in the past decade. Companies have raised significant interest in the development of AI implementation in Digital Marketing. Furthermore, they strive to explore which Artificial Intelligence algorithms are the most effective within Marketing strategy. In addition to this, big data become a central figure of investment toward data-driven decisions in companies. This is due to empirical findings of how the company's users behave, their actions, and how to boost revenue by processing such data. If we take into consideration how worldwide, multinational companies are putting tremendous resources into R&D departments to go ahead of the competition in terms of AI-powered Digital Marketing, it can be said that traditional advertising will be replaced in full capacity by 'intelligent' Digital Marketing campaigns. Thus, this study investigates which AI approaches are applicable in Digital Marketing, which Digital Marketing aspects are most flexible to be under AI impact and how AI can shape the Digital Marketing process to evolve as a better version of itself. The outcome of this thesis can be a good base for further research about combining Digital Marketing and AI, and also it can contribute to other persons of interest in the professional sense.

Keywords:

Digital Marketing, Marketing, Online Marketing, Digital Advertising, Internet Marketing, Machine Learning, ML, Artificial Intelligence, AI

CERCS: P170 Computer science, numerical analysis, systems, control

Kuidas tehisintellekti digitaalses turunduses kasutatakse

Abstraktne:

Tehisintellekti ja digitaalse turunduse järele on tunnustatud vajadus ning nende populaarsust on viimasel kümnendil märgatud. Ettevõtted on tundnud suurt huvi tehisintellekti rakendamise (arendamise) vastu digitaalses turunduses. Lisaks püüavad ettevõtted nad uurida, millised (tehisintellekti) algoritmid on turundusstrateegias kõige tõhusamad. Lisaks, sellele saavad suurandmetest on muutunud keskseksne investeerimisnäitajaks ettevõtetes andmepõhiste otsuste tegemisel. Selle põhjuseks on empiirilised järeldused ettevõtte kasutajate käitumise, nende tegevuse ja kuidas selliste andmete töötlemise abil stulude suurendada tulumise kohta. Kui me võtame arvesse seda, kuidas kogu maailmas panevad rahvusvahelised ettevõtted panevad oma teadus - ja arendusosakondadesse tohutuid ressursse, et minna tehisintellekti abil töötava digitaalse turunduse osas konkurentsias, ette, võib öelda, et traditsiooniline reklaami vertikaalsus asendatakse täies mahus „intelligentse“ Digitaalse turunduse kampaaniatega. Seega käesolevas lõputöös uuritakse selles uuringus, millised tehisintellekti lähenemisviisid on digitaalses turunduses rakendatavad, millised digitaalse turunduse aspektid on tehisintellekti mõjul kõige

paindlikumad ja kuidas tehisintellekt saab kujundada digitaalse turunduse protsessi enda paremaks versiooniks arenemiseks. Selle lõputöö tulemus võib olla hea alus edasiseks uurimiseks digitaalse turunduse ja tehisintellekti ühendamise edasiseks uurimisekskohta ning samuti võib see anda panuse teistele professionaalses mõttes huvitatud isikutele.

Võtmesõnad:

Digitaalturundus, turundus, veebiturundus, digitaalne reklaam, Interneti-turundus, machine õpe, ML, tehisintellekt, tehisintellekt

CERCS: P170 Arvutiteadus, arvutusmeetodid, süsteemid, juhtimine (automaatjuhtimisteooria)

Acknowledgments

Foremost, I would like to express my sincere gratitude to my supervisor Prof. Fredrik Payman Milani, for the continuous support of my master thesis and research, for his patience, motivation, enthusiasm, and immense knowledge. His guidance helped me in all the time of research and writing of this thesis. I could not have imagined having a better advisor and mentor for my work.

My completion of this thesis could not have been accomplished without the endless support of my academic colleagues and classmates, so many thanks for their assistance at any time. Their motivation was more than helpful in challenging moments while doing this thesis.

Besides my colleagues, I would like to thank my family for their warm words and tremendous gratefulness for their positive attitudes toward my entire studies.

Finally, I would like to put the most enormous gratitude to my wife Nataša for making me decisive to start this academic journey in Estonia, and I cannot imagine writing this thesis without her countless patience to push me forward like a wind in one's sails.

1. Introduction

Recent years have shown a rapid development of Digital Marketing and its aspects in the new global economy. This has helped alter the way we look at the world just as business is directed. But before understanding the importance and purpose of Digital Marketing in this paper, the "Digital," "Marketing," and "Digital Marketing" terms must be explained [1].

By Digital, it means "*relating to, using, or storing data or information in the form of digital signals by involving or relating to the use of computer technology* [2]". Marketing is defined as "*the action or business of promoting and selling products or services, including market research and advertising* [3]". However, the primary definition of this thesis is oriented toward Digital Marketing, and it is depicted as "*the component of marketing that utilizes the Internet and online-based digital technologies such as desktop computers, mobile phones and other digital media and platforms to promote products and services* [4]".

AI (Artificial Intelligence) is playing a significant role in addressing the usage in Digital Marketing, and it is generally defined as "*science that deals with building intelligent machines that can think and respond like a humans* [5]". In this paper, the main AI definition will be presented as "*transforming customer-facing services for digital marketers by increasing efficiency and optimizing user experience by data usage* [6]". AI has become an increasingly important area in Digital Marketing to understand our target and collected data in a better way [7]. Moreover, in the past years, AI has been a question of great interest in a wide range of Digital Marketing phases.

The concept of Artificial Intelligence was noted for the first time in Marketing in 1998 at Columbia University in a report on "digital bookshelves." In that time, this kind of algorithm has been used to give simple recommendations to the customers for what the algorithm "thinks" the audience will like. In 2013, marketers started to recognize AI for data analytics purposes in Digital Marketing to make data-driven decisions [8].

Nowadays, Digital Marketing requires the processing of massive data in a more precise and faster way, and AI algorithms have become so progressed that soon they will make techniques by utilizing billions of tons of information. Therefore, the goal is to research how AI can be used in Digital Marketing and why AI is important in the Digital Marketing field. Thus, the importance of this topic comes from the expanded need to develop an immense quantity of data in Digital Marketing. Furthermore, how AI can change Digital Marketing processes such as planning, implementation, measurement or optimization by increasing efficiency through automation is also a question relevant for this topic to investigate.

Therefore, in the light of this content, this thesis is studying what are the challenges that must be managed in terms of which AI approaches have been used in Digital Marketing [9], which Digital Marketing aspects are affected by AI [10] and in which way AI can change Digital Marketing processes [11].

1.1. Research Questions

The research objective is to examine: "*How is AI used in Digital Marketing.*" To achieve the research objective, three research questions are formulated as follows:

RQ1: Which approaches of AI is used in Digital Marketing?

RQ2: What aspects or phases of Digital Marketing are impacted using AI?

RQ3: How is AI changing the Digital Marketing processes?

The first research question helps us understand how and which AI features can be applied to Digital Marketing. The importance of this question relies on capitalizing on AI aspects in terms of better understanding and usage of data analysis in Digital Marketing. In other words, marketers will have more precise insight into bringing decisions in the Digital Marketing field while relying on AI capabilities that affect data. The second question refers to which phases of Digital Marketing have AI been used. By this, the significance of this question can provide a better comprehension of how the usage of AI impacts Digital Marketing phases such as Exposure (Awareness), Discovery, Consideration, Conversion, Customer Relationship and Retention. It is essential to regulate a stronger cohesion among phases with AI help and simplification of implementing phases by wider usage of AI and less usage of human interaction. The third question relies on an understanding of how AI has enabled redesigning Digital Marketing processes. The concept of this question is central to investigate Digital Marketing processes of how they are changing under AI. In this way, we can grasp how AI should reshape these processes to get improved planning of Digital Marketing processes, which is most relevant to this question.

The thesis's contribution is applicable as a summary of results that enable marketers to select, implement, or understand how they can use AI to further their marketing efforts. In other words, the summary could help Digital Marketing experts to adopt new ideas of how AI can be used in their marketing strategy to boost the specific value or to gain a business result.

The study aims to examine how Artificial Intelligence will influence Digital Marketing. This work takes the form of a Systematic Grey Literature Review (GLR). Grey literature intends to review a broader scope of literature and provide more eligible and available examples of Digital Marketing and AI compared to standard SLR. This review examines data from relevant publications adhered to by following a systematic approach to how AI impacts Digital Marketing. The research aims to investigate the impact of AI on Digital Marketing in terms of collecting and using data, the website purchasing experience, advertising, personalization, etc. Following the case from GLR, via conducting comparative process performance analysis, I present the GLR. The relevance of this topic comes from the increased need and trend of processing a tremendous amount of data in Digital Marketing. Moreover, how AI can enhance data-driven decisions in Digital Marketing has aroused an interest nowadays.

Grey literature represents a relevant source of information, and as such, the relevant data on how AI is used when applied in Digital Marketing can be extensively found using GLR. Furthermore, the necessity of GLR depicts its purpose in finding the answer to how companies are

using AI for Digital Marketing, where many examples are never formally published as academic research [12].

The benefits of this thesis can be used by those working within the Digital Marketing field, businesspeople who are interested in the AI field, developers who are keen to find out about how AI data analytics can be used in Digital Marketing, are persons of interest.

The remainder of this thesis is structured as follows:

Section 2 presents the Background – it depicts a review of the topic being researched, current information related to Digital Marketing and AI and previous studies of concerned topics – Digital Marketing and AI. Next, *Section 3* discussed Related Work, where the main goal is to explain the related search areas within the Digital Marketing context. Then, in *Section 4*, I will present the Literature Review, which includes Grey Literature Review, interpreted as material created by organizations outward of conventional business or academic channel. Next, *Section 5* presents and outlining the Results and findings of this study. *Section 6* discusses the results – to interpret, analyze, and discuss the meaning of the result, particularly within Research Questions. Finally, *Section 7* concludes the thesis – to bring the thesis within a full circle in terms of discussion and explicitly state answers to research questions.

2. Background

At the beginning of the Background part, the brief history of Digital Marketing, its definition and phases have been described. After that, a short history fact of Artificial Intelligence, the clarification of what AI represents and its types that impact Digital Marketing will also be depicted until the end of the Background chapter. The importance of describing Digital Marketing and Artificial Intelligence history, definition and its components is for a better understanding of how Digital Marketing and AI have developed through history until this day. Also, it will be revealed what are the most relevant definitions for the thesis and how Digital Marketing works via phases, i.e. which AI types can impact Digital Marketing.

2.1. Digital Marketing

The first discussions and analyses of Digital Marketing have been emerged and used during the 1990s. It was used for the first time on the digital platform Web 1.0 during its initial development. Via the Web 1.0 platform, marketers could search for data, but they could not change it among themselves. Therefore, they were unsure whether their strategy will work or not due to insufficient digital development at that time [13].

Later on, this non-interactive issue has been changed by using Web 2.0. The popularity has been raised over the search engine, which has become the most important in Digital Marketing until this day – Google. Due to the higher interaction on Web 2.0, companies were able to communicate better with their customers in a digital way. They grasped the importance of social networks in terms of the higher engagement of the new target market [14].

In the light of this historical development path, a couple of terms have been used interchangeably so far - digital marketing, internet marketing, online marketing and e-marketing. However, the Digital Marketing term is the one that has been established as the most used nowadays among marketers. In this thesis, Digital Marketing is defined as "*the component of marketing that utilizes the Internet and online-based digital technologies such as desktop computers, mobile phones and other digital media and platforms to promote products and services* [15]". Thus, "*the component of marketing*" represents an integral part of Marketing among many other Marketing components, "*utilizes the Internet and online-based digital technologies*" means that Digital Marketing is using online platforms, hardware/software tools and other digital media networks to make marketing more useful and time-performance practical, and "*to promote products and services*" shows that the primary goal of Digital Marketing is to digitally advertise commodity in the best possible way.

This definition clearly describes where it belongs in terms of advertising, where it can be used, by which tools, and how it can be used, i.e. the end value of Digital Marketing. In other words, it describes Digital Marketing in the way of matching the digital world, digital tools and its components with traditional marketing, making a benefit that is less time-consuming and more practical.

While it was clarified the significance of relevant Digital Marketing description and what it represents, it is also important to mention which phases matter in Digital Marketing. Questions have been raised about the division, i.e. which are the exact phases of Digital Marketing. While Anatoli et al. [16] defined Digital Marketing stages as Awareness – Consideration – Purchase Intent – Satisfaction; Ryan & Russ [17] described Digital Marketing phases like Awareness – Evaluation – Conversion; and Machado et al. [18] depicted Awareness – Consideration – Preference – Action – Loyalty – Advocacy as regular Digital Marketing funnel, the most representative framework of Digital Marketing phases has been presented by Iliuta et al. [19] as Exposure – Discovery – Consideration – Conversion – Customer Relationship – Retention.

The Digital Marketing framework by Iliuta et al. [19] has used the model that considers the latest trends in Digital Marketing, and it can be most related to AI and its impact, which can be seen in Figure 1. Other proposed frameworks are also represented, and there are some matches among phases in terms of the content. Still, compared to the chosen one, they also contain some phases that are more considered a part of traditional marketing and/or sales funnel. Thus, due to the clarity and the best description of phases of the last-mentioned division, I will describe these phases more comprehensively for thesis relevancy and a better understanding of how Digital Marketing works.

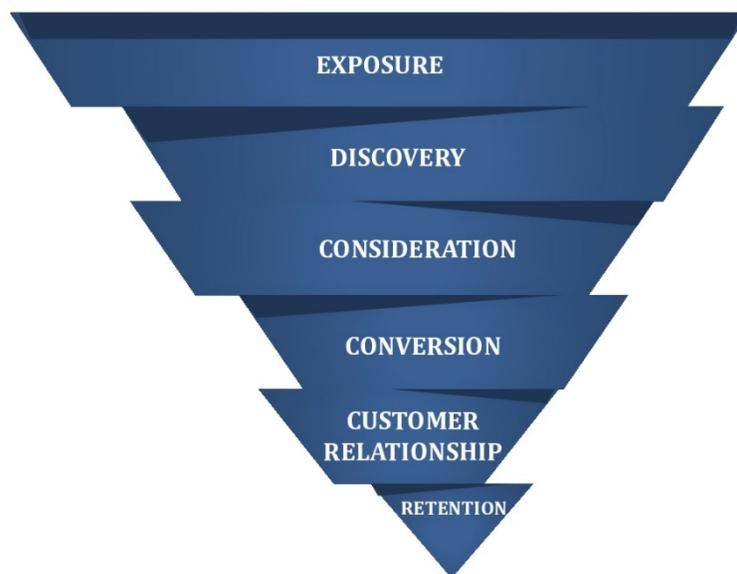


Figure 1. *Digital Marketing funnel*

The phase of *Exposure*, also well-known as *Awareness*, serves to aware new customers about the company's brand and product via digital tools such as SEO (search engine optimization), search ads, email campaigns, social media, etc. During this stage, customers can learn which values the company represents, and there is a possibility to create trusted relationships. Thanks to the Internet, marketers are now much closer to attract a potential audience than before [20].

When it comes to the attraction of the prospect, the next phase is to grasp how to keep them on the website and come back. Therefore, in the *Discovery phase*, customers mainly focus on exploring products and learning more about the company's products and services. The most relevant example for this phase is recommendations. The company site offers recommendations based on previous customer searches to create customized content (good SEO practice is vital in this stage) [20].

In the *Consideration phase*, customers are familiar with the company's brand, what it represents, and the values of such a product. Also, they know that the company has a solution to their problem to solve. Therefore, the most suitable strategy is to stress the company's benefits and differentials. On the other hand, the company is better engaged with customer's perceptions in terms of what they are looking for. In this way, the company can present facts that can demonstrate the productivity of the solution. Some examples of this phase are FAQ and case studies [20].

After presenting the product's benefits, the next move is to help customers bring the purchase decision. In the *Conversion phase*, customized content with sponsored links is the company's focus, concentrating only on its conversion. The completion of purchasing action converts visitors and prospects into customers. Many strategies can be used in this phase, such as free trials, referring friends for free purchase or discount on the larger purchased amount of products or services [20].

The next step is to get more closed and stronger bond with the customer. Thus, the *Customer Relationship phase* consists of the best possible customer service, clear communication and after-sales care. In other words, in this phase, the company updates customers about their products/services, provides them rewards and support for purchased products. For instance, using direct channels such as email marketing to communicate with the customers or video tutorials of how to use the product represents a reasonable basis for the long-term relationship [20].

Finally, it is essential to persuade customers to go back repeatedly to the same website to purchase within the *Retention phase*. If customers have a good experience and the product offers needed value, they will often return to make new transactions. In this way, customer loyalty is highlighted as the most crucial factor for the company's financial profit. Since regular profit remains stable by regular customers, it is necessary to make current customers as usual ones [20].

In the history of Marketing development, Digital Marketing has been thought of as a key and evolutionary factor in making advertisement more advanced and valuable for marketers than ever before. The transition from Traditional to Digital Marketing phases has happened due to the higher demand for digital knowledge bases by the audience, and now marketers can engage with phases more effectively [21]. However, with the extremely rapid development of technologies, the digital industry and businesses demand more data that must be processed. A challenge came in front of marketers to face with – online data to process in a semi-manual way takes too much time while market must be investigated, which pulls the need of improvement or upgrade of Digital Marketing phases. Therefore, to catch the pace with such an evolution on the market in terms of Digital marketing phases, Digital marketing processes, and data to be handled, a new norm must be involved to tackle these concerns – Artificial Intelligence [21].

2.2. Artificial Intelligence

Artificial Intelligence has become a major area of interest within the field of Digital Marketing in recent years. But its origins come from even 50 years ago, when Jule Gregory Charney, who is considered a father of modern meteorology, has developed the first computerized program to predict the weather. It was probably the first, simple example of an Artificial Intelligence demonstration known as Machine Learning [22].

Later on, in 1998, Amazon company started using "collaborative filtering" on its e-commerce site for proper recommendations in favor of its customers. In 2013, Yahoo automated Insights WordSmith Platform, which relied on AI to scan massive data about sports results and structure all information as reporting statistics, briefly informing their sports audience. In 2014, programmatic ad buying was very popular with AI usage, decreasing manual labor tasks as much as possible. Then in 2015, Google has upgraded its search results with Machine Learning methodology, making its algorithm more advanced to interpret better search queries that aimed at more precise search results. Afterward in 2016, virtual assistant devices have been embedded with AI, making better opportunities and user experience for customers. Also, social networks have reduced labor work in customer service and chatbots in the same year [22]. As can be seen, both expressions – Artificial Intelligence and Machine Learning have been used interchangeably. Nevertheless, they are not quite the same terms, but the perception of equalizing them as the same ones can lead to confusion. Even though both terms have been used for big data and data analysis, there are slight differences.

While the term AI involves a computer program that is capable to "think" by itself without additional programmed instructions in advance, Machine Learning is just one process where a computer can learn what is need or necessary to learn. ML (Machine Learning) process of learning is the same as human learning through experience. The main difference is that the ML program can learn just one or two things simultaneously. However, the power of ML is located in the AI capability to control the ML process and to see what people are not able because ML is just one of the ways how scientists enable AI to be more intelligent than it is [23].

Therefore, this paper's central definition of AI would be presented as "*transforming customer-facing services for digital marketers by increasing efficiency and optimizing user experience by data usage* [24]". The expression "*transforming customer-facing services for digital marketers*" means that AI can modify customer service for marketers much easier and faster than before within manual work. And "*by increasing efficiency and optimizing user experience by data usage*" involves the processing of big data in favor of marketers to improve the effectiveness and fluency of the user experience for their customers.

This definition is substantial for the thesis because it clearly describes the possibilities of AI and how marketers can benefit from AI, where AI can significantly impact and how customers can benefit from it. The specificity of this definition is not described in the pure AI manner since Digital Marketing has been involved, so it can be more relevant for thesis purposes.

Given all that has been mentioned so far regarding AI, it is worth saying that several types of AI must be appropriately introduced to understand which AI approaches can transform or

impact Digital Marketing and in which way. Consequently, in a world that inverts around technology where AI will alter the essence of Digital Marketing, five types of AI make an impact [25]:

1. *Predictive Analytics:*

- As long as commercial usage of data is not a novelty in the marketing world, AI has continued to prosper over the years and improve tool's capacity in a great measure and record exponential growth within efficiency and productivity. In this way, marketers can better understand the pains and gains of their consumers and more effectively interpret marketing campaigns as well. As probably the most beneficial AI innovation, predictive analytics can foresee customer's purchases and potential clients [25].

2. *Chatbots:*

- Nowadays, most e-commercial and business websites have utilized chatbots to ease customer communication with AI and solve their possible concerns. AI chatbots have been a valuable tool in terms of personalized interaction with a new experience. On the contrary, it makes an additional value for companies and saves time. Therefore, instead of using human customer representatives, an AI chatbot is available to the customers to respond quickly and effectively [25].

3. *Hyper-Segmentation & Customer Profile Building*

- As previously said, AI can collect and process an extensive amount of data. Thus, when it comes to analyzing the desired target audience, AI can learn and adapt to purchasing habits and searching tendencies. Moreover, it can find patterns and connect them as a broad picture to predict what customers will search for in the future. This kind of hyper-segmentation can predict customer's behavior and make personalized commercials. For instance, Facebook will know which kind and type of content will serve the customer based on previous AI analysis of customer's behavior and patterns which the audience follows [25].

4. *Voice Search*

- Voice search has become very popular nowadays for verbally asking the intelligent speaker to execute commands such as playing music, setup travel directions, or text messaging. All thanks to embedded AI, which is creditable for sophisticated algorithms installed into voice search devices. Even though only 25% of the USA population uses this device, it is predicted that it will be even more favorite among the audience in the foreseeable future [25].

5. *Visual Searches*

- The visual search feature has a history of almost 20 years. It uses an AI algorithm to scan images and match or find similar or related results for the customer. For anyone interested in looking for a specific picture online, especially for an e-commerce business, it is a benefit of finding a product via image and purchase it. In addition to this,

AI uses its technology to match image patterns to find the desired image for the user [25].

AI has the potential to make a significant impact on Digital Marketing. As we could notice from previous paragraphs, there is a space for improvement around Digital Marketing to make it more efficient for both marketers and customers. This progress could be depicted as a step forward in developing not just an existing concept in Digital Marketing – AI relationship, but also to induce some innovation which could be a milestone in understanding and functioning of Digital Marketing.

3. Related Work

In this chapter, Related Work that is aligned with this thesis will be presented. Therefore, diverse interpretations will be described in terms of Digital Marketing and Artificial Intelligence. Moreover, several phases of Digital Marketing will be argued, and the perception and usage of AI in data will be discussed. On top of that, different aspects will be discussed and compared within Related Work to provide how the content of this thesis distinguishes from what was presented and explored by other researchers.

3.1. Digital Marketing

Regarding Digital Marketing, professor Raluca[26] said that Digital Marketing is a "*blanket term for the targeted, measurable, and interactive marketing of goods or services using digital technologies to reach and convert leads into customers and preserve them.*" It should digitally promote a business within SEO, social media marketing, videos, e-newsletters and other digital methods, which will invoke an incentive toward customers to go through different phases of Digital Marketing until the final stage. By his conclusion, Digital Marketing should retain old visitors, engage new ones and keep them in the long term to the e-commerce websites by the content value [26]. Professor Raluca's grasping of previous work is like understanding and defining Digital Marketing as a key factor in this thesis. However, the main difference is that the definition in this paragraph promotes reaching and converting leads into customers (what is more related to the sale). In contrast, the primary definition of this thesis goes with the promotion of products and services as a primary goal of Digital Marketing (what is more related to marketing).

By understanding of Alan [27], he described Digital Marketing phases within the AIDA funnel (Awareness – Interest – Desire – Action) as a basis, where full attention has been concentrated mainly on sale points. To make it more applicable for Digital Marketing purposes, he updated the current funnel with a new one which consists of upcoming phases: Awareness – Consideration – Preference – Purchase – Retention. He claimed that such a funnel is focused on customer retention and that the process is circular; so the last phase leads directly to the first one, to invoke repeated purchases [27]. Presented phases in the previous chapter (Exposure – Discovery – Consideration – Conversion – Customer Relationship – Retention) has some similarities with Alan's framework in terms of phases title and the content of these phases. Still, the chosen framework of this thesis is also focused on gaining and exploring customer's desires, values and issues, and foster long-term relationships with clients, in comparison with a model presented by Alan.

3.2. Artificial Intelligence

When it comes to Artificial Intelligence, Prokopis & Dimitris [28] said that Artificial Intelligence is "*is the study that includes computational procedures to perform actions that human beings do and require a certain amount of intelligence.*" They said that due to significant technological development in recent years in AI, data mining, and predictive analytics, Digital Marketing met a new approach of its usage within data-driven strategies that helped in better decision-making. Also, they firm that AI can satisfy marketers by helping them identify and analyze strengths, weaknesses, opportunities, threats and market needs. In this way, AI can absorb data from websites, social networks, analytic reports and extract clear and accurate predictive results [28]. Although

this kind of standpoint in terms of what AI is and its application in Digital Marketing is in a good correlation with this thesis, there is a relative divergence of studies performed by Prokopis & Dimitris and study conducted in this thesis. Namely, the AI definition from this paragraph is mainly concentrated on a general understanding of AI and its supremacy with technical processes over human intelligence. In contrast, the AI definition presented in this thesis focuses more on how it affects Digital Marketing, how marketers can benefit from AI and how artificial intelligence could lead to data-driven decisions more effectively.

A similar view was represented by Norbert [29], where he claimed that there is a strong synergy between Digital Marketing and Data Science by leveraging advanced tools of predictive models within the Machine Learning approach. He even goes further with the free availability of AI models such as API (application programming interface) and TensorFlow (Python/R platform) for gaining a powerful ally to predict a particular algorithm. The interesting fact is that he is questioning whether AI could replace human involvement or is it still a decisive factor in Marketing. He believes that this trend of replacing humans is happening now in online business and e-commerce, while the list will just go on in the future. It is simply because humans cannot make such fast-paced decisions in seconds compared to AI, which can process thousands of data [29]. While the views and predictions of Norbert are compounded of proven facts that are aligned with the data algorithm of this thesis, there is a difference in terms of non-explaining the usage of data in Digital Marketing from his side and how data can be used in Digital Marketing within AI. In other words, he lacks the explanation of how data can be used in AI to train specific models to predict customer profile and their actions. Instead, he focuses on the decision-making process between AI programs and humans compared to how this paper will focus on data key points related to Digital Marketing and AI.

Taking into consideration the above-mentioned opinions and attitudes, it is safe to conclude that there are materials that support the uphold of AI involvement within Digital Marketing. Besides, there is a space for significant improvement in developing data – in which direction could data processing can be updated and to enhance data-decision making within Digital Marketing. Therefore, the concern of how AI is used in Digital Marketing will be further explained and investigated in a detailed manner in upcoming chapters.

4. Grey Literature Review Protocol

4.1. Research Methodology

The aim of this study is to examine how Artificial Intelligence will influence Digital Marketing. This work takes the form of a systematic grey literature review (GLR). Grey literature intends to review a broader scope of literature and providing more eligible and available examples of Digital Marketing and AI in comparison with standard SLR. This review examines data from relevant publications adhered to by following a systematic approach to how Digital Marketing is impacted by AI. The goal of the research is to investigate the impact of AI on Digital Marketing in terms of collecting and using data, the website purchasing experience, advertising, personalization etc. Following the case from GLR, via conducting comparative process performance analysis, I present the GLR. The relevance of this topic comes from the increased need and trend of processing a tremendous amount of data in Digital Marketing.

4.1.1 Planning of Grey Literature Review

A significant and essential difficulty of this research is a necessary dependence over what is called Grey Literature Review, interpreted as material created by organizations outward of conventional business or academic channel. Although the usage of GLR can be difficult since there is a lack of academic representation of data and analysis, combining relevant grey literature sources and practice around this topic is the most relevant for this research [30]. The GLR follows the guidelines suggested by Godin [31]. GLR can be classified into four main phases: (1) grey literature databases, (2) customized Google search engines, (3) targeted websites, and (4) consultation with contact experts. The methodology of searching GLR databases relevant to the subject of the review is done during the first phase. The second phase concerns customized Google search for online documents on the Internet, combining several search terms for narrowing results to a particular area of interest. The third phase identifies browsing specific websites relevant to Digital Marketing and AI. Finally, the fourth phase is engaged for identifying documents for screening included content experts to recognize other items for potential inclusion in review [31].

4.1.2. Motivation for Review

The motivation behind grey literature comes from reviewing and examining a broader scope of AI and Digital Marketing literature. Also, grey literature represents a relevant source of information, and as such, the researcher can benefit from its methodology and the possibility of finding the most authentic papers. Furthermore, the necessity of GLR depicts its purpose in finding the answer of how companies are using AI for Digital Marketing, where many examples are never formally published as academic research [31].

4.1.3. Research Questions

This GLR aims to identify publications and web-based resources addressing how AI can impact Digital Marketing. The research objective is to examine: "*How is AI used in Digital Marketing.*" The first research question helps us understand how and which AI features can be applied to Digital Marketing. The importance of this question relies on capitalizing on AI aspects in terms of better understanding and usage of data analysis in Digital Marketing. In other words, marketers will have more precise insight into bringing decisions in the Digital Marketing field while relying on AI capabilities that affect data. The second question refers to which phases of Digital Marketing have AI been used. By this, the significance of this question can provide a better comprehension of how the usage of AI impacts Digital Marketing phases such as Exposure (Awareness), Discovery, Consideration, Conversion, Customer Relationship and Retention. It is essential to regulate a stronger cohesion among phases with AI help and simplification of implementing phases by wider usage of AI and less usage of human interaction. The third question relies on an understanding of how AI has enabled redesigning Digital Marketing processes. The concept of this question is central to investigate Digital Marketing processes of how they are changing under AI. In this way, we can grasp how AI should reshape these processes to get improved planning of Digital Marketing processes, which is most relevant to this question.

RQ1: Which approaches of AI are used in Digital Marketing?

RQ2: What aspects or phases of Digital Marketing is impacted by use of AI?

RQ3: How is AI changing the Digital Marketing processes?

4.2. Search Strategy

The overall search strategy is to find a body of relevant web-based sources. Two search strategies were used to secure that essential studies were not missed. For the primary search, I have used search strings on Google Search Engine. The search terms have been chosen based on the topic of this thesis as the most relevant to find eligible papers. The following abstracts, words and phrases were used in the search engine, combining each other for the best result.

Following the primary screening, I have conducted a secondary search which refers to webpage links, websites, articles and consultancy references in reports I found. Every kind of such paper has been scanned manually by subject headings and abstract content to grasp whether the paper's content is aligned with the thesis topic or not. Also, search strings used in primary screening must be matched with the paper's keywords, so this matching would confirm the eligibility of the paper.

4.2.1. Search String

For the development of the search strings, I followed the guidelines suggested by Kitchenham [32]. All keywords were examined from each aspect of the research questions. The term "AI" is key and derived from the scope of the study. I also include "Digital Marketing" as this term is mainly used interchangeably for "AI and Digital Marketing" search queries. Using the Advanced Search option in Google Search, I have examined a few hits and experimented with the variation

of strings: Digital Marketing, Marketing, Online Marketing, Digital Advertising, Internet Marketing, Machine Learning, ML, Artificial Intelligence and AI. In addition to this, I have filtered my search with a .pdf file extension to get the most relevant results. The search conclusion has spawned the most appropriate search strings for this research, which are refined to the final list below:

- a. "Digital Marketing"
- b. "Online Marketing"
- c. "Machine Learning"
- d. "ML"
- e. "Artificial Intelligence"
- f. "AI"

Therefore, all of above mentioned search strings have been combined interchangeably for extracting the best possible results. The main requirement was to combine at least one string from Digital Marketing field and at least one string from Artificial Intelligence field. In this way, it was firm that search strings have been setup regularly. To have an insight into how search strings have been formulated, based on the search terms, please refer to the Appendix section for more info.

4.2.2. Search sources

The electronic database – Google, is selected based on coverage of reports (annual, research, technical, project, etc.), working papers, government documents, white papers, videos and evaluations in AI and Digital Marketing [30].

4.3. Selection Criteria (Relevance)

The purpose of the selection criteria is to identify relevant studies that provide sufficient information to address the research questions. The criteria consisted of exclusion and inclusion criteria.

IC1: Is this study within the domain of AI and Digital Marketing?

IC2: Does this paper discuss AI implementation in Digital Marketing?

IC3: Does the paper present an example of how AI is used in Digital Marketing?

Given the aim of the study, the papers must cover the domain of Digital Marketing and AI. The usage of AI and Digital Marketing can be named differently, and as such, the first inclusion criterion refers to any relevant study which covers Digital Marketing and AI field. The second criterion aims at capturing papers that discuss AI involvement in Digital Marketing. For our purposes, papers selected must have enough information about AI features that affect Digital Marketing. The third criterion is considering the paper that involves the business, practical or theoretical example of how AI can be applied in the Digital Marketing. Studies that treat the AI impact on Digital Marketing or fail to present changes made:

EC1: Is the study written in English?

EC2: Is the study conducted from 2015 onwards?

EC3: Is the study a duplicate?

EC4: Does URL work and is it freely available?

EC5: Does the study exclude blog posts as a type of irrelevant source of research?

The first two exclusion criteria are defined to ensure language requirement and time relevance. If the study is not accessible in English, it will be impossible to understand them and consider further research. Papers that date from 2015 onwards can be considered relevant and valuable from a time standpoint. It is essential to stay up with the latest research findings, new developments, ongoing trends and changes in a social and business environment to foresee and to understand the AI impact on Digital Marketing better. Then, duplicates were excluded. Duplicate papers are those ones with the same title, with the same content and from the same authors that appear in different search pages, links or websites (exact duplicate). In case of an exact duplicate, only one is included, and in the case of version duplicates, the most recent version is included. Then, the paper must be freely accessible, i.e. the presented URL of the paper must have an open approach for a full availability of the content. Finally, any searched blogspot can be deliberated as real-life experience content, whereas for this research opinion-driver papers are more relevant and of value.

4.4. Screening Procedure

The screening was conducted according to search strings. The data extraction procedure was performed using the predefined search string and applying it to the Google search engine. To ensure unbiased screening, search string and selection criteria have been applied in Incognito mode.

First, I searched with each string separately. I clicked on each link and examined: is it in English language (EC1), is it dated from 2015 outward (EC2), is paper a duplicate (EC3), is URL free and functional (EC4) and is it a blogpost or not (EC5). Then I checked the title: is the title and abstract aligned with the research topic or not. For those papers which titles and abstract matched with the research topic, I have examined the content of the paper to assess: if it was within the domain of AI and Digital Marketing (IC1), does it discuss the implementation of AI in Digital Marketing (IC2) and is there any example of how AI is used in Digital Marketing (IC3). The conducted search yielded 1350 hits in total. Every page has contained 10 results, excluding the last page of the search results. After the initial screening search, I have selected 64 hits out of 1350 hits within the domain of AI and Digital Marketing, with the AI implementation in Digital Marketing, and it had an example of AI usage in Digital Marketing.

Based on uncertain results, I have excluded 1286 hits due to different inclusion and exclusion criteria. There were 462 duplicates; 589 hits had title and abstract which were not aligned with the research topic; and full-text scanning shown that 235 hits are not relevant for AI and Digital Marketing. In addition, inputs for Advanced Search were applied by only English language as the most relevant for this research, .pdf has been used as a file type, and papers dated only from

2015 onwards have been taken into consideration. Accordingly, the following combinations of strings have been applied and resulted in the following order, as it can be seen in Figure 2 below:

- 1) STR1 – Artificial Intelligence Machine OR Learning "Digital Marketing" (177 hits in total):
 - a. 10 hits have been included
 - b. 167 hits have been excluded
- 2) STR2 – Artificial Intelligence "Digital Marketing" (197 hits in total):
 - a. 23 hits have been included
 - b. 174 hits have been excluded
- 3) STR3 – Machine Learning "Digital Marketing" (192 hits in total):
 - a. 11 hits have been included
 - b. 181 hits have been excluded
- 4) STR4 – AI "Digital Marketing" (188 hits in total):
 - a. 11 hits have been included
 - b. 177 hits have been excluded
- 5) STR5 – ML "Digital Marketing" (178 hits in total):
 - a. 2 hits have been included
 - b. 176 hits have been excluded
- 6) STR6 – Artificial Intelligence "Online Marketing" (216 hits in total):
 - a. 4 have been included
 - b. 212 have been excluded
- 7) STR7 – Machine Learning "Online Marketing" (202 hits in total):
 - a. 3 hits have been included
 - b. 199 hits have been excluded

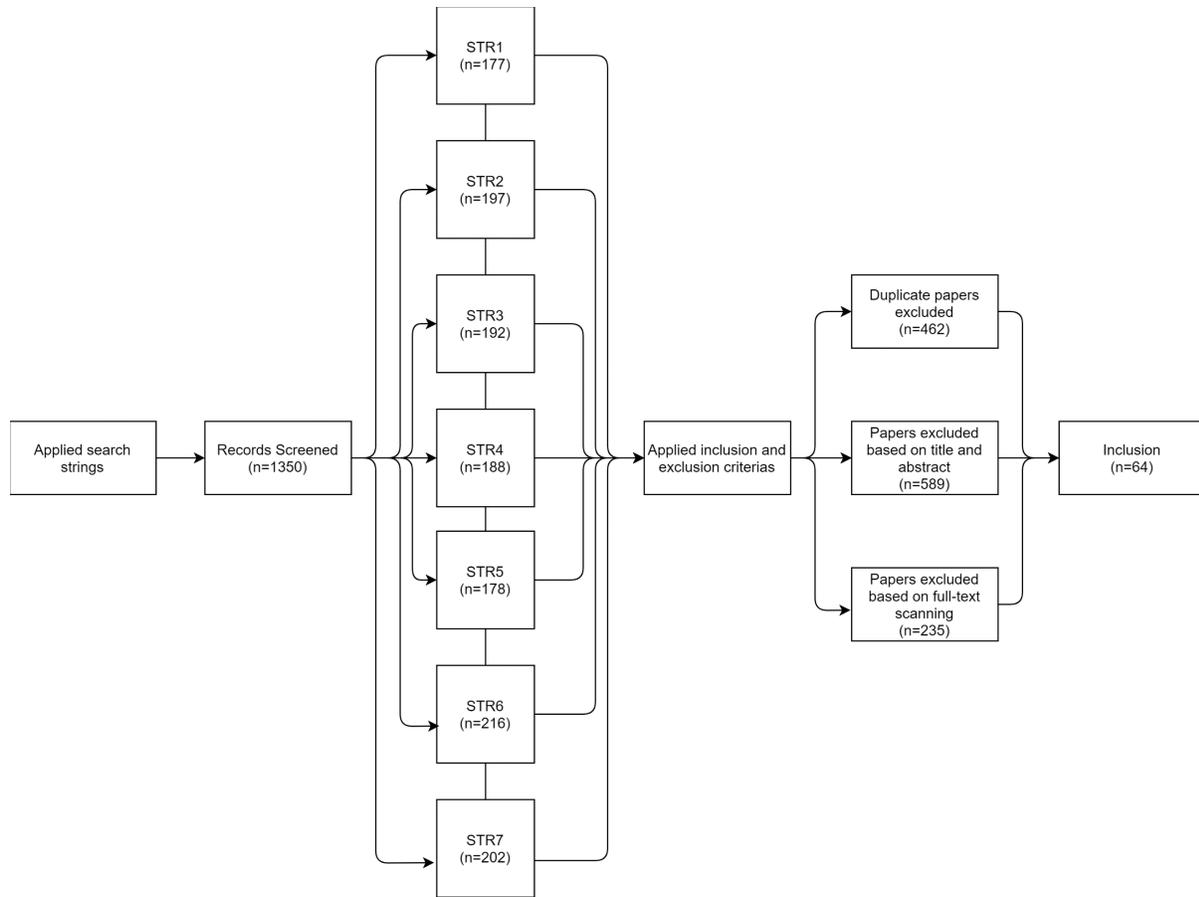


Figure 2. Screening selection procedure

The reason why I have used several strings independently is that Google has limited me on the number of hits. Furthermore, when I applied strings at the last search page, Google noted that its algorithm had omitted some entries very similar to the already displayed n number to show the most relevant result. Thus, I have conducted several search strings to get enough results relevant for this topic to research.

4.5. Data Extraction Strategy

Following the identification of the final list of papers, relevant data were extracted. To ensure an unbiased data extraction strategy, it has been recommended to develop a data extraction form and strategy. These are discussed below.

4.5.1. Data Extraction Form

The data extraction form can be developed after the screening process [33], allowing for utilizing the insights drawn during the screening phase. I have extracted three types of data. The

first relates to data about the paper. The second was data related to the context of the study and finally, the third type related to the AI impact on Digital Marketing.

Data about the Paper	
Title	Title of the paper
Technical and scientific source link	Unique URL of the paper
Authors	Authors of the paper
Publication Year	Year of publication of the paper
Type of the paper	C: Conference J: Journal W: Workshop M: Magazine S: Symposium T: Thesis B: Book and Book chapter IAWP: Internet article and white paper
Author Affiliation	A: Academic I: Industry C: Collaboration
Data about the Context of the Study	
<i>AI Approach</i>	
a. AI Approach name	To name different types of AI approaches which affect on Digital Marketing
b. Description of AI Approach	AI Approach is considered as one single type of AI and as a component of AI system
c. Required data for AI Approach	All types of AI approaches which are relevant from the impact standpoint on Digital Marketing
d. Source of getting these data	Extracted data stored in excel table, which were previously extracted from Google Search engine

e. The purpose of the AI approach in Digital Marketing	To examine to what extent and how AI approach impacts on Digital Marketing
<i>Digital Marketing phases impacted by AI</i>	
a. Impacted aspects of Digital Marketing	Impacted phases which are considered as component and vital part of Digital Marketing
b. Where AI is making an impact in a specific phase	Where in each phase of Digital Marketing AI is making an impact
c. Why these phases are taken into consideration	To describe the justification of taking selected phases as relevant for AI impact
d. The purpose of the affected phase by AI	What is the value and reason of the affected phase by AI
<i>What is the change of AI impact on Digital Marketing processes</i>	To describe Digital Marketing, how it was before AI impact, how it looks like now after AI impact and the crucial differences between these two states. In other words, a concrete change of impact must be clearly depicted.

4.5.2. Data Synthesis and Reporting

The extracted data were summarized and analyzed. The results were used to get answers to research questions and afterward to discuss discovered results.

5. Results

This chapter's standard approach is to introduce and depict the outcomes in a systematic and detailed way. In other words, the objective is to determine the results and findings of AI and Digital Marketing and how AI is used in Digital Marketing. All data for providing results come from the data extraction table. According to this, the results of three research questions will be presented in this chapter:

RQ1: Which approaches of AI are used in Digital Marketing?

RQ2: What aspects or phases of Digital Marketing are impacted using AI?

RQ3: How is AI changing the Digital Marketing processes?

5.1. RQ1: Which approaches of AI are used in Digital Marketing?

The first research question has examined which AI approaches are used in Digital Marketing. The meaning of this RQ (Research Question) is to explain which AI aspects have the most considerable impact and which are the most used in Digital Marketing, i.e. which AI aspects are "game changers" in the Digital Marketing field. According to this, Figure 3. represents the most used AI approaches in Digital Marketing, both in business and academic areas.

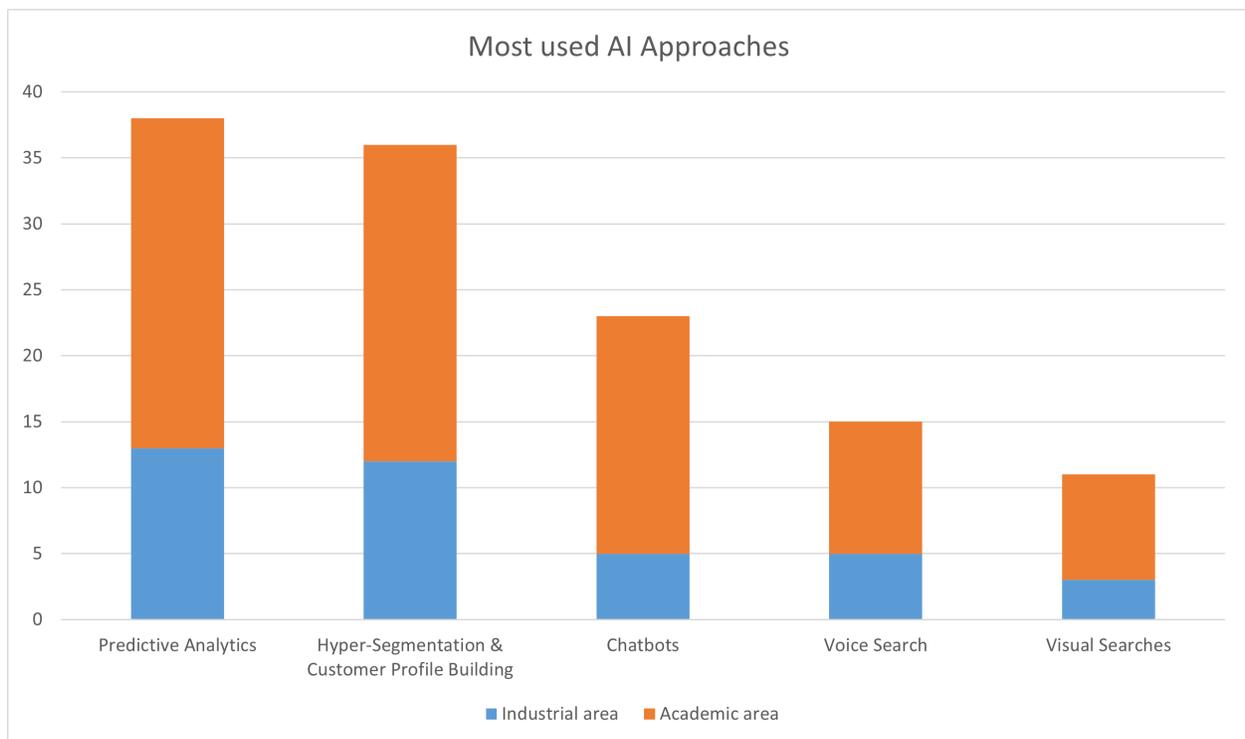


Figure 3. Most used AI Approaches in Digital Marketing

The information for this graph has been pulled out from the data extraction table. As we can see, the most used AI approach in Digital Marketing in both industrial and academic areas is Predictive Analysis; then it comes to Hyper-Segmentation & Customer Profile Building; the third most used AI approach is Chatbots; and the last two places go with Voice Search and Visual Searches, respectively.

Based on the graph, *Predictive Analytics* depicts the most dominant aspect used in Digital Marketing. Therefore, Predictive Analytics may be defined as "a branch of advanced analytics that harnesses all that big data to predict future events or results. It integrates various techniques from data mining, statistics, modeling, machine learning and artificial intelligence to process and analyze various data sets for the purpose of developing predictions." [35]. Simple saying, besides defining a clear business objective in Digital Marketing, Predictive Analysis starts from building small training models within prediction methodology for creating digital marketing campaign content with the highest audience reach. Thus, if the model is not performing, necessary changes should be applied. Then, within a successful response, further data collection is the next step in analyzing and learning our model based on the user interaction with the running campaign. Finally, implementing and optimizing small changes will sharpen the predictive model that is being tested [35]. For example, McKinsey has been tested how OEM (Original Equipment Manufacturer) automotive industry could implement AI forecasting and personalization into their marketing and sales department, using data such as user's device, location, language and operating system. This predictive analysis aims to apply automation and forecasting within collected data into Digital Marketing to boost sales [36]. Another example comes from Frederick [37], where he explains how Machine Learning could boost PPC (Pay-Per-Click ads) in Digital Marketing to raise the online traffic of visitors, while required data could be customer's location, gender, age, and whether the user has been to the specific site before, and to which pages. The initial purpose is to adopt an existing or build a new machine learning model and then train it to the point that company has a high level of confidence in the predictions it makes when processing masses of data [37].

The second most used AI approach in Digital Marketing is *Hyper-Segmentation & Customer Profile Building*. Since this approach consists of two sub-approaches, they will be defined separately to understand this term better. Hence, Hyper-Segmentation "leverages artificial intelligence (AI) and real-time data to deliver more relevant content, product, and service information to each user [38]." On the other hand, Customer Profile Building represents "an automated model of a group of customers who share common traits by collecting data from various online sources so all of this data could be used to train machine learning algorithms to identify customer profiles [39]." This approach starts with AI learning about customer's searching habits and buying patterns through data. Then, AI finds patterns and matches data points about unknown users, which gives a built customer profile. In the end, Hyper-Segmentation creates personalized ads by defining a customer's profile based on its behavior, interests and recommendations, i.e. specifically tailored content that customers are engaged with [40]. For instance, the Articoolo AI-powered software program was designed to create quality online content using AI's NLP (Natural-Language Processing). Articoolo's NLP is processing the marketer's desired words through the best-based online resources and extracting sentiment and essential keywords. In other words, it helps writers generate ideas and quickly produce articles, all based on simple topic requests of interest to customers [41]. Amazon and Netflix provide a good illustration of how supervised, unsupervised, and reinforcement learning can be used to customize the content for its users by extracting data such as clicks, page views, purchase history, customer demographic and geographic location (Amazon) and customer's movie rankings, type of movies or series watched, basic information (Netflix). In both Amazon and Netflix cases, the aim is to hit their customers' tastes and preferences based on their previous history searches and what they prefer [42].

The next one on the list of most used AI approaches are *Chatbots*. By definition, Chatbot is "*a computer program that simulates human conversation through voice commands or text chats or both, which could be embedded and used through any major messaging applications* [43]." Even though Chatbots are classified within CRM (Customer Relationship Management), most papers from the data extraction table have represented Chatbots as part of Digital Marketing in terms of new customers who want to know more about potential product or service. The function of Chatbot is pretty straightforward: They first analyze from which keywords are customer's question consisted. They have embedded data bank in their system, which is based on Machine Learning. Once Chatbot understood the question, they will deliver the answer that it thinks is right based on available data. Over time, within the AI algorithm and training period, the chatbot machine will better understand the "right" answer [44]. This can be illustrated briefly by providing SamBot chat software, made by Samsung, which is implemented in IoT tools to improve the corporate website's interactivity and effectiveness in providing information, responding to users' questions, and prolonging the conversation with its intelligence. Their dataset's base was conversational logs with customers, collected in the past within the traditional communication with customers and extracting data from online forums. The goal is to provide the most effective and realistic 24/7 FAQ without delaying existing and potential customers [45].

The fourth most common AI approach in Digital Marketing represents *Voice Search*. By definition, Voice Search "*includes open-domain keyword query on any information on the Internet and refers to the use of voice recognition technology which allows users to perform searches by simply speaking into a device* [46] [47]." While Voice Search is considered a part of customer service in the business world, it also became an essential part of the Digital Marketing structure. Namely, many companies are working on establishing an SEO methodology adjusted to the voice search inquiries, which requires a different strategy than traditional online "keyword typing" searches [48]. The Voice Search process's interpretation goes like this: Firstly, an AI-powered IoT device is processing and ingesting human speech into text by analyzing the user's intonation and phonetics, so each word is contextualized for the migration from speech to text. After detecting commands and questions, IoT devices connect to the online external data source (e.g., Google Search) to find relevant answers. Finally, the requested information is delivered in a digestible format for accomplishing the user's query [49]. An excellent example of how Voice Search could be used in Digital Marketing fields comes from celebrities and influencers. When the user performs a voice search on his/her IoT device regarding the specific topic of their interest, famous persons are putting an effort to increase their online visibility by placed, searched voice question from the user, thanks to incorporated SEO methodology with voice search. In this way, all of the voice searches connected with strong, established SEO will lead customers to the celebrity person's website or social network [50].

The least popular AI approach among academic and business circles is *Visual Search*. The Visual Search can be interpreted as "*an artificial intelligence technology that allows users to conduct an internet search using a picture, rather than keywords* [51]." Visual Search functions are next: it starts with a simple uploading picture on a specific website by the user, and then AI-powered software triggers deep neural networks to decode what it is to reveal the picture's size, shape and color. Then the consumer has been delivered with the most similar or the same

object/place/shape being searched, or whatever is the most similar to the requested inquiry [51]. Even though this approach is not so popular, this technology's interest has been raised in e-commercial business in recent years. A good example can be depicted within a foreigner coming to the tourist place for the first time. Looking at an unknown restaurant, the user opens Google Lens on his/her smartphone, taking a picture of the restaurant, and the user can be served with complete data about the restaurant – its menu, comments, reviews, service etc. [51]. Also, when the user wants to buy something online, and the customer has a picture but does not know where to purchase it, the picture can be uploaded on the Pinterest website. Its AI algorithm can analyze image data by gathering groups of pixels and finds the same or the most similar item online, where to buy, and the item's specifications as well [51].

After examining all the arguments mentioned above, it is safe to conclude that Predictive Analytics and Hyper Segmentation are the most current AI approaches in Digital Marketing. However, regarding the increasing trend of AI popularity, it can be assumed that Chatbots will soon become a standard in the company-customer relation. Simultaneously, Voice and Visual Searches are already recognized with the high potential to engage new customers and raise profit rate with its AI capabilities and features.

5.2. RQ2: What aspects or phases of Digital Marketing are impacted using AI?

The second research question will be focused on which aspects of Digital Marketing are impacted by AI. In other words, RQ2 will examine which Digital Marketing phases are the most susceptible to the AI influence so they can be, with AI support, of the help for marketers in creating a marketing strategy. According to the data extraction table, Figure 4 illustrates which Digital Marketing phases are the most affected by specific AI aspects.

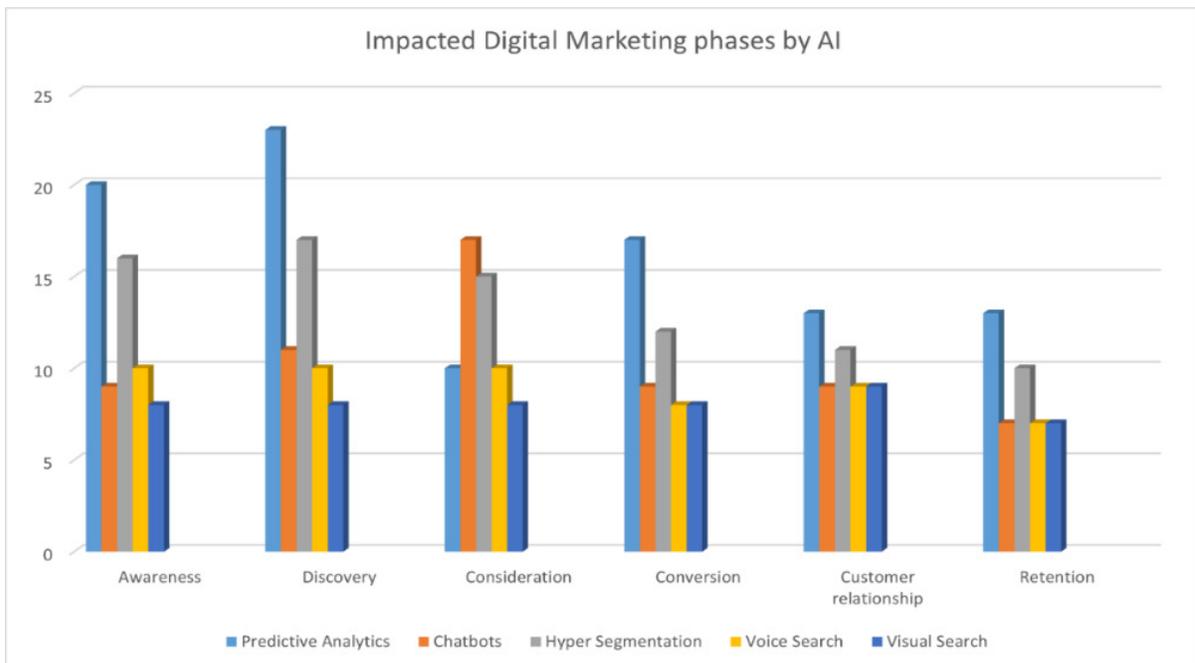


Figure 4. Most impacted Digital Marketing phases by AI

As presented on the graph, the Awareness and Discovery phases are the most affected Digital Marketing phases by almost all AI aspects. Next, the Consideration and Conversion phases are in the second place as the most affected ones, with slight differences by which specific AI aspect has influenced more or less these two phases. Finally, the Customer Relationship and Retention phases are in the last of all DM phases, where the former is slightly more influenced than the latter one.

The first DM aspect which was under the AI influence is the *Awareness phase*. This phase can be interpreted "*as a general term that describes how familiar (aware) consumers are with a brand or its products and services* [52]." At this stage, the customer is trying to find a solution for his/her problem. Sometimes they cannot define their issue, and they are looking for more information about their concern, where often company's SEO assists, powered by AI nowadays [53]. As with the previous analyzed DM (Digital Marketing) phase, and for this phase, Predictive Analysis and Hyper Segmentation are the most dominant aspects that impact the Awareness phase. For instance, Hyper Segmentation has been used on social media to adapt to what customers are searching for. According to this, SEO and AI-powered methodology follows which keywords customers are using online. This step is helpful because, based on user's keywords, companies will be able to personalize their inquiries so the company's brand will be more visible. In this way, customers will be aware of their product and services to solve their problem [54].

The second impacted Digital Marketing aspect by AI, judging by the graph, is the *Discovery phase*. It is defined as "*a phase of in-depth secondary and primary research and analysis within the marketing process* [55]." The basis of this aspect is that customers will start with reading few online pages of the company's website to consume content and learn more about what the company sells/offers. In other words, customers know something about the company's values, but they want to know a bit more regarding products and services [18]. Figure 4 depicts that Predictive Analysis and Hyper Segmentation have the most significant influence among all AI aspects. For example, an Articoolo web content developer program, AI-powered software, helps writers generate ideas and quickly produce articles. This software matches the Hyper Segmentation AI aspect for equalizing customer taste with what they offer, leading to a higher Discovery rate, and introducing what Articoolo can do for the customer, representing all of its technology and gains [41].

When it comes to the third most impacted DM phase by AI – *Consideration phase*, it is interpreted as "*the brands or products left after a person has narrowed down their choices based on their own personal screening criteria, such as previous exposure, brand awareness, price, and more* [56]." At this stage, the customer is pretty much familiar with the company's brand and its products. Therefore, the user has an issue that must be addressed by the benefits that specific product has. In this way, the company must demonstrate that they are better than its competitors and deliver a high-quality solution in a short amount of time [57]. By taking a view on Figure 4, it can be inferred that Chatbots and Hyper Segmentation are prevailing as the most present AI phases in the Consideration phase. After all, it makes sense – when customers are interacting about some product with a Chatbot, they can ask for a price tag of the product or service, for instance. It could be something like this: "I am interested in your product with a price of up to 100 €." With multiple

questions like this by numerous customers, AI would collect necessary data and, by the learning process, form the most favorable price tag, which could be considered as an advantage [58].

The next, fourth, Digital Marketing phase which AI influences is the *Conversion phase*. This phase is presented as "*a final decision of leads, where they become customers, which further means purchasing company's product or service* [59]." This stage is consisted of converting current visitors into customers. This means that they are familiar with the brand, and there is also an opportunity that converted customers become loyal advocates [60]. Regarding this Digital Marketing phase, Figure 4 is giving an insight into the data that Predictive Analytics and Hyper Segmentation have influenced the most on the Conversion phase. An example could be provided by extensive data, previously processed by AI, to marketers and making driven-data decisions by volume, variety and velocity of information. With such sorted data extracted from social media, emails, and forums, marketers can track and analyze customer moves to close them to the purchase action and personalize prices for a higher conversion rate [61].

One of the least popular Digital Marketing aspects is *Customer Relationship*. We can define this aspect as "*the core business strategy that integrates internal processes and functions, and external networks, to create and deliver value to targeted customers at a profit. It is grounded on high-quality customer-related data and enabled by information technology* [62]." Simply said, Customer Relationship provides to the sales and marketing team to run and operate relationship with the company's current and eventual customers. It tracks all interactions with users and collects data about them where AI can perform a deep analysis about customer's concerns and desired values [63]. Figure 4 clearly shows that the same two previously mentioned AI phases have the same effect as on the Conversion Phase. Maybe it is best described by Jyri [64], where he explained how collected data from the Customer Relationship process is used in the Machine Learning process to understand customer's pains and gains, leading to segmentation and personalization of the company's products and services.

The final Digital Marketing aspect, with the lowest impact by AI, is the *Retention phase*. The retention phase is illustrated as "*focusing on bringing back customers who have already done business with a brand and keeping customers who are already connected to a brand* [65]." This phase's essence is to retain existing customers to go back repeatedly on its website to make purchase actions. If they feel that they can gain value from the company's product, they will become loyal customers. Thus, it is significant to convert current users to regular ones for a higher purchase transaction [66]. The influence of AI phases is entirely the same as for the Customer Relationship phase, judging by Figure 4. For instance, the aim of Sandeep[66] was to depict how companies wanted to make a strategic advantage within ML usage of how to grasp customer's satisfaction in the Healthcare field. In that way, the company understood how they could improve medical products and their accuracy so users could repeat a purchase.

Considering all facts previously said, it can be inferred that the Awareness and Discovery phases are under the most significant influence by AI. Even though AI does not impact other Digital Marketing phases in such a measure as for the Awareness and Discovery phases, companies are interested in investing further in every DM aspect, judging by preceding examples and

arguments. This is because companies would like to generate a higher income rate and fortify the marketing team with AI assistance.

5.3. RQ3: How is AI changing the Digital Marketing processes?

When it comes to the third research question, it serves to explain how AI is changing the Digital Marketing process, i.e., how AI improves it from the standpoint of how the DM process was before, how it is now, and what is the crucial difference. Thus, this research question will allow us to grasp possibilities and enhancements in the Digital Marketing process made by AI and how they can be used by marketers to boost DM performances.

From the communication aspect with customers, the perfect example can be represented through the Customer Relationship phase of Digital Marketing and its evolution toward AI Chatbots. The chronology of its evolution can be depicted from Figure 5:

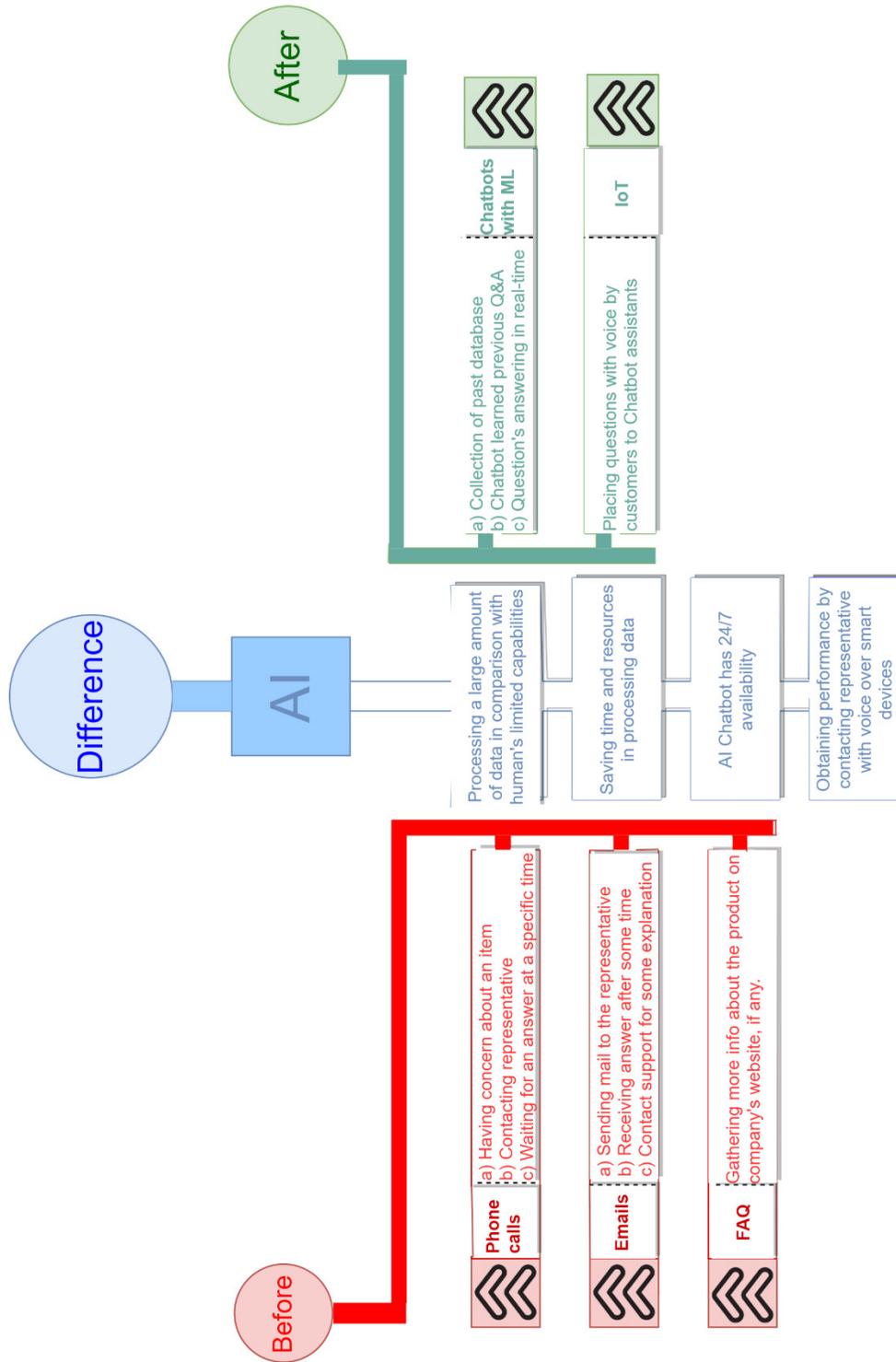


Figure 5. Representing Before-After-Difference condition of AI Chatbot

- 1) **Before:** The primary tools for communication with users were phone calls and emails in the past. The manner of approaching such contact was like this: customers have contacted support via phone or email for specific issues regarding the product or want to know more about its product while waiting for the representative's answer. Then, users receive their answers in some period. Such communication took place in a specific time frame, i.e. in customer support staff's work time [67]. Besides such an approach, there was a FAQ section for customers on the company's official website to find out more about their concerns or gain more information about the product by themselves [45].
- 2) **Now:** Through time, there was a need for a faster response to customers. That being said, companies made an effort to invest in Chatbots powered by AI and its sophisticated algorithm. The base for such technology was Machine Learning: all questions from customers have been collected in the database, and such data has been processed through Chatbot, so it was trained to learn what customer's concerns are. This means that Chatbots could answer users' questions in real-time with previously prepared answers based on the training process [45]. One more device which brought a revolution in communication with customers is IoT. With voice inquiries, customers could place questions to the digital assistant and get all available answers via voice. Although this technology relies primarily on leading search engine companies, some corporations developed and recognized such an approach as an advantage [45].
- 3) **Difference:** The main difference is reflected by Artificial Intelligence and its capability to process a large amount of data in a short amount of time, which is an impossible task to do by a human. In other words, it means that humans need a specific amount of time to find an answer based on the customer's question, which requires extra time to overlook the existing database with a risk that customer support does not find an answer at all [45]. On the contrary, AI Chatbot can go through the entire database, scan specific questions placed by the user, and extract an answer within the shortest amount of time. Another difference is represented within the timeframe, i.e. required worktime when customer support is available. By this, customers can contact support just in their work time, limiting possibilities for them to gain an answer. However, Chatbot is available 24/7, which represents a benefit for a customer from the standpoint of all-the-time availability. On top of that, the FAQ section cannot always provide an answer, so Chatbot annulates such a drawback with its incorporated and trained database. Also, instead of calling support and waiting for the line with the representative, customers can contact support via IoT devices, saving a significant amount of time searching for an answer via voice [45].

Another aspect that could be examined is Predictive Analytics. It can be questioned from the standpoint of Digital Marketing processes (Awareness – Discovery phases) and AI Predictive Analytics as it is represented from Figure 6:

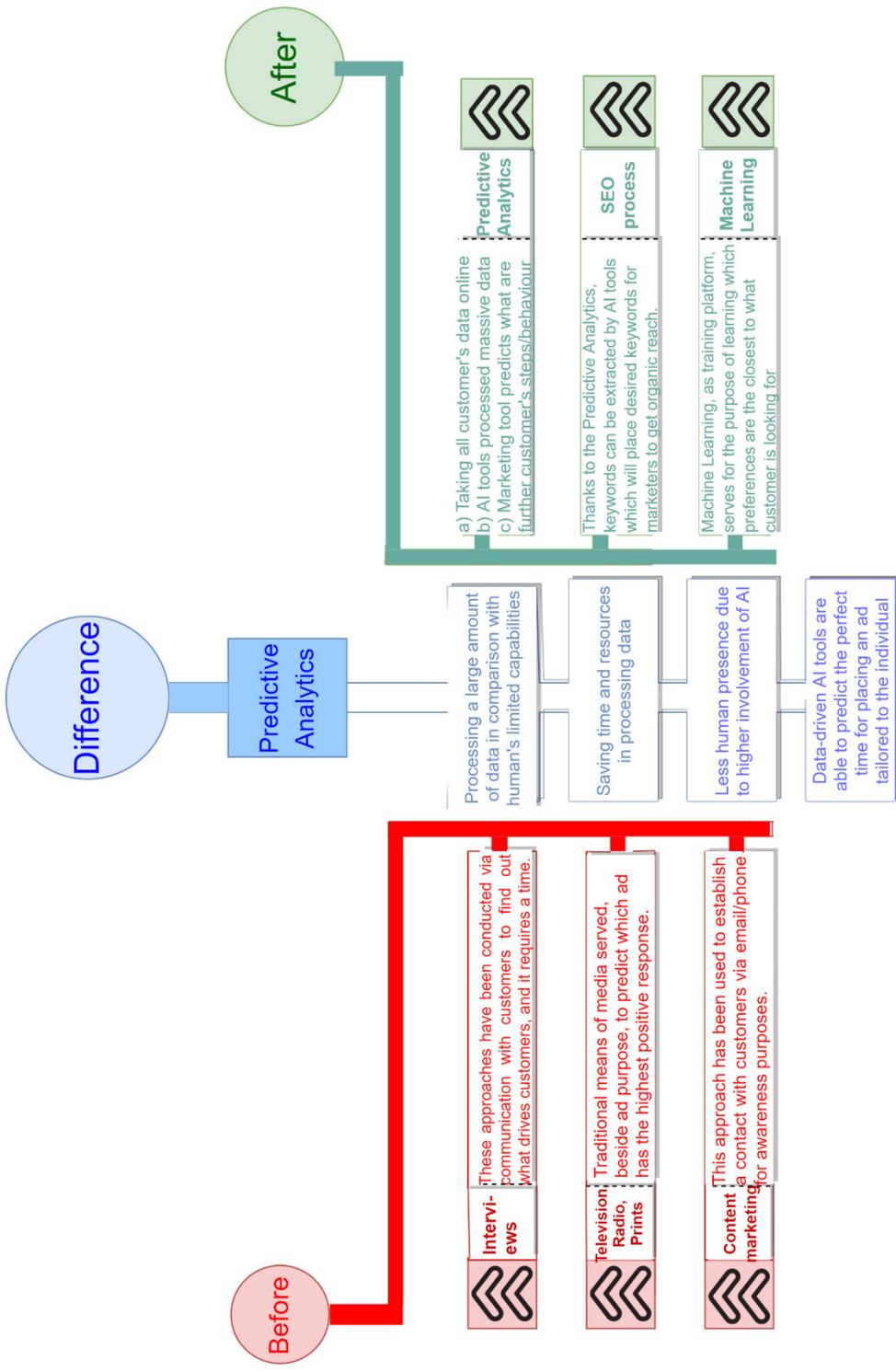


Figure 6. Representing Before-After-Difference condition of Predictive Analytics

- 1) **Before:** Marketers have relied on the previous Digital Marketing results, which created further strategy. Relying on conducting questionnaires, interviews and study cases with customers, and on their own "gut", marketers have created a Digital Marketing plan, including an online advertisement, copywriting strategy, content marketing etc. Even before that, traditional means of media focused on the advertisement process – television, radio, newspapers, etc. [68]. Most marketing experts also took the balance between supply and demand as an indicator of a successful business and promotion [69]. Moreover, marketers have made content messages, tended to be delivered via email, phone or printed media, hoping that such messages will work with customers without data analysis [70].
- 2) **Now:** Today, most companies have invested in Predictive Analytics, based on data-driven decisions, to get as much precise data results as possible. These results lead to a better direction in terms of conducting Digital Marketing processes toward the right path. Simply said, by historical data and data collected online from customers, AI can process millions of data in a minimum amount of time. That being said, marketers can rely on prediction analysis in terms of what, where and how the customer will make a purchasing action or behave in a specific manner [71]. Based on predictive analytics, marketers can have insight into what content is most desirable for customers or their favorite preferences regarding products and services, which further leads marketers to gather new users. Moreover, companies can serve the customer's proposed content thanks to Predictive Analytics before users start with an online searching process [72]. Also, Predictive Analytics can follow a pattern of most used keywords on search engine platforms via SEO methodology. According to this, marketers can set up keywords based on previous AI prediction which has conducted in-depth data analysis to reveal which phrases or slangs are most used online [73]. On top of that, Machine Learning can now analyze product's and service prices to gauge the relation among the most favorite and most minor favorite products and extract the most acceptable price by customers [58].
- 3) **Difference:** The most significant contrast between Before and Now phases are reflected in AI's ability to process massive amounts of data for prediction purposes. This approach saves a lot of time and makes the Digital Marketing process much faster and more productive than before [74]. Human involvement is less needed due to higher AI algorithm engagement, which predicts specific Digital Marketing process elements, and where marketers are supposed to bring decisions based on data [64]. Instead of guessing what the prime times are for placing an ad online, marketers now know the exact time when customers are most active online and what they search the most at a specific time, thanks to data-driven AI tools [75]. Another difference can be seen as a power processing advantage – AI has significantly more processing power than humans in analyzing customers, which is impossible for humans to go through thousands, even millions of raw data [72]. Therefore, by contrast, AI-predictive marketing places much of this decision-making in the hands of machines, requiring marketers to focus on

choosing the right success metrics and setting the appropriate parameters within AI systems, so AI can experiment to find the best marketing approach [76].

The following most variable approach is concerned with Hyper-Segmentation & Customer Profile Building. It can be examined from the aspect of how companies have tailored products and services before, how marketers now use the benefits of personalization and customization, and a comparison between these two previously mentioned conditions. Figure 7 illustrates how it looks like:

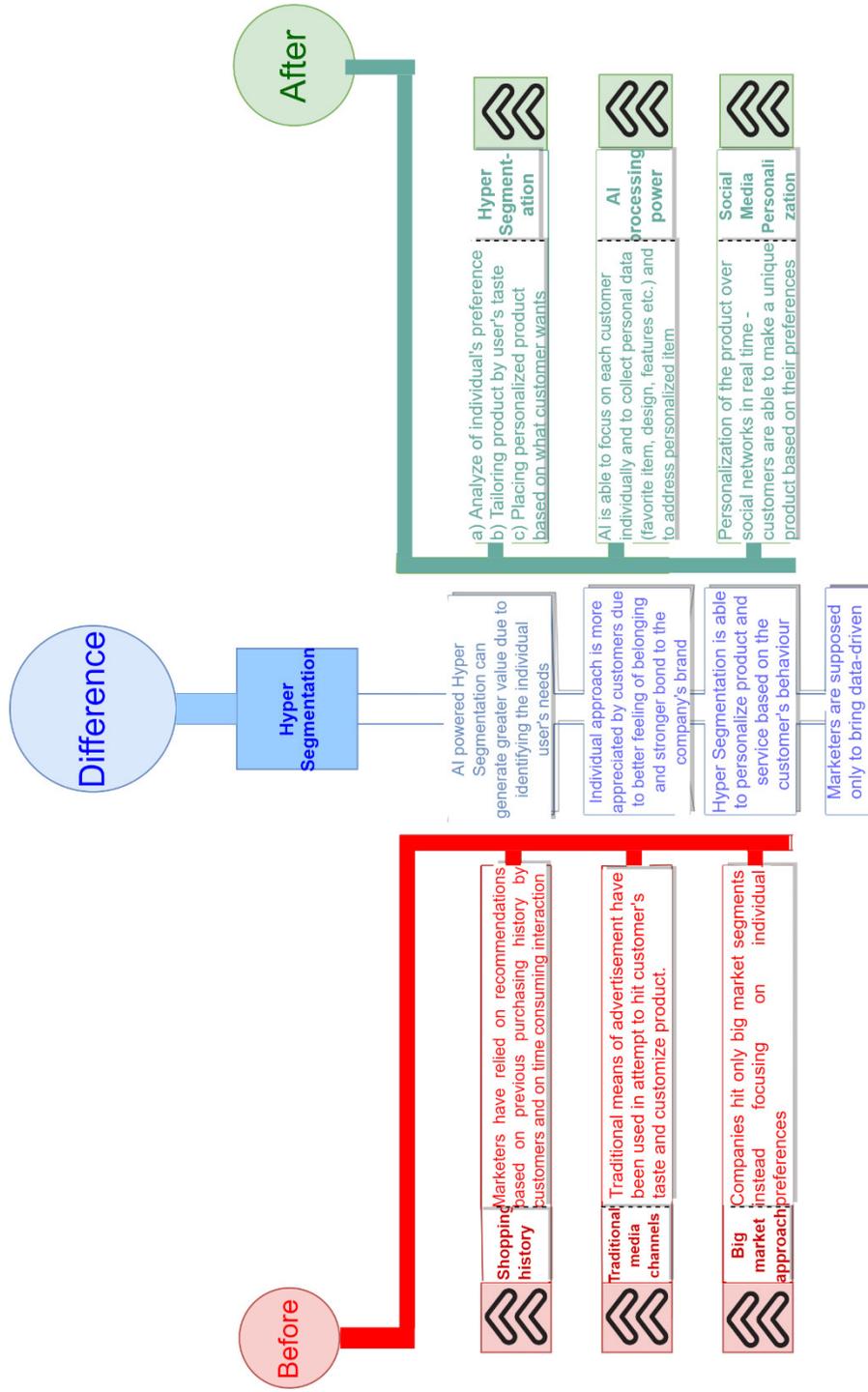


Figure 7. Representing Before-After-Difference condition of Hyper Segmentation

- 1) **Before:** The main issue was expressed as the impossibility of depicting what most customers want and the size of the market that companies have targeted. In most cases, marketers have relied on simple recommendations based on previous purchasing habits made by customers. However, this approach has required a strong interaction with customers so that marketers would know them and their preferences better – so this approach demands time [75]. Marketers mainly used traditional media channels, such as billboards, TV ads and other less segmented formats for presenting the right product or service [77]. Also, companies tended to target significant customer segments to enhance sales growth and market share. This led to the presentation of product's benefits only to the big segments, which resulted in the market division into homogenous. This concludes that companies focused on a considerable number of customers rather than on individual preferences [78].

- 2) **Now:** Nowadays, companies are more concentrated on satisfying an individual customer's preferences rather than a group. This is since offerings are focused on an individual for creating a more personal belonging to the company's community and products [78]. On the other hand, AI can collect online data, which contains personal records of customers, favorite items, design preferences, product features etc. With such a database, AI is triggering its personalization feature, which leads to addressing a specifically tailored product to the specific customer at a specific time [30]. Another example can be seen over social networks: some corporations tend to personalize social media content. Due to the popularity of social media usage for business and shopping purposes, efforts have been made to offer a feature that could customize products according to the customer's preferences [54]. The example for Netflix and Amazon could be mentioned: Netflix offers its content to the specific user based on his/her previous watching history. In contrast, Amazon offers products based on the user's previous purchasing history. In that sense, customized content is placed for customers [42].

- 3) **Difference:** The most noticeable characteristics of Hyper Segmentation, which differs from the traditional approach, are that it can generate greater value due to identifying the individual user's needs. Most customers appreciate such an approach since personalization is focused on personal preferences, it makes stronger bonds and feelings of belonging toward the company's brand [78]. Based on collected data, AI can recognize the customer's needs and deliver specifically tailored content to push them on purchasing action. Instead of relying on the marketer's sense and feeling of what customers most want, AI gives a thorough analysis of customers' online behavior. According to this, companies will be able to personalize web content by their taste, leading to a unique customer's experience of the products and services. One of the benefits is that AI can carry such a workload and free up human time. Moreover, the human-AI interaction can result in processing the right content for the customer, where marketers are supposed to bring data-driven decisions in which format the personalized content should be delivered [79].

In the end, one of the more significant findings to emerge from this study is that both AI and Digital Marketing processes have been vastly developed in favor of companies. This investigation's findings complement those of earlier studies from the data extraction table – when one phase in AI is evolving, the DM (Digital Marketing) phase will evolve as well and vice versa. Taken together, these research results can be summarized in Figure 8:

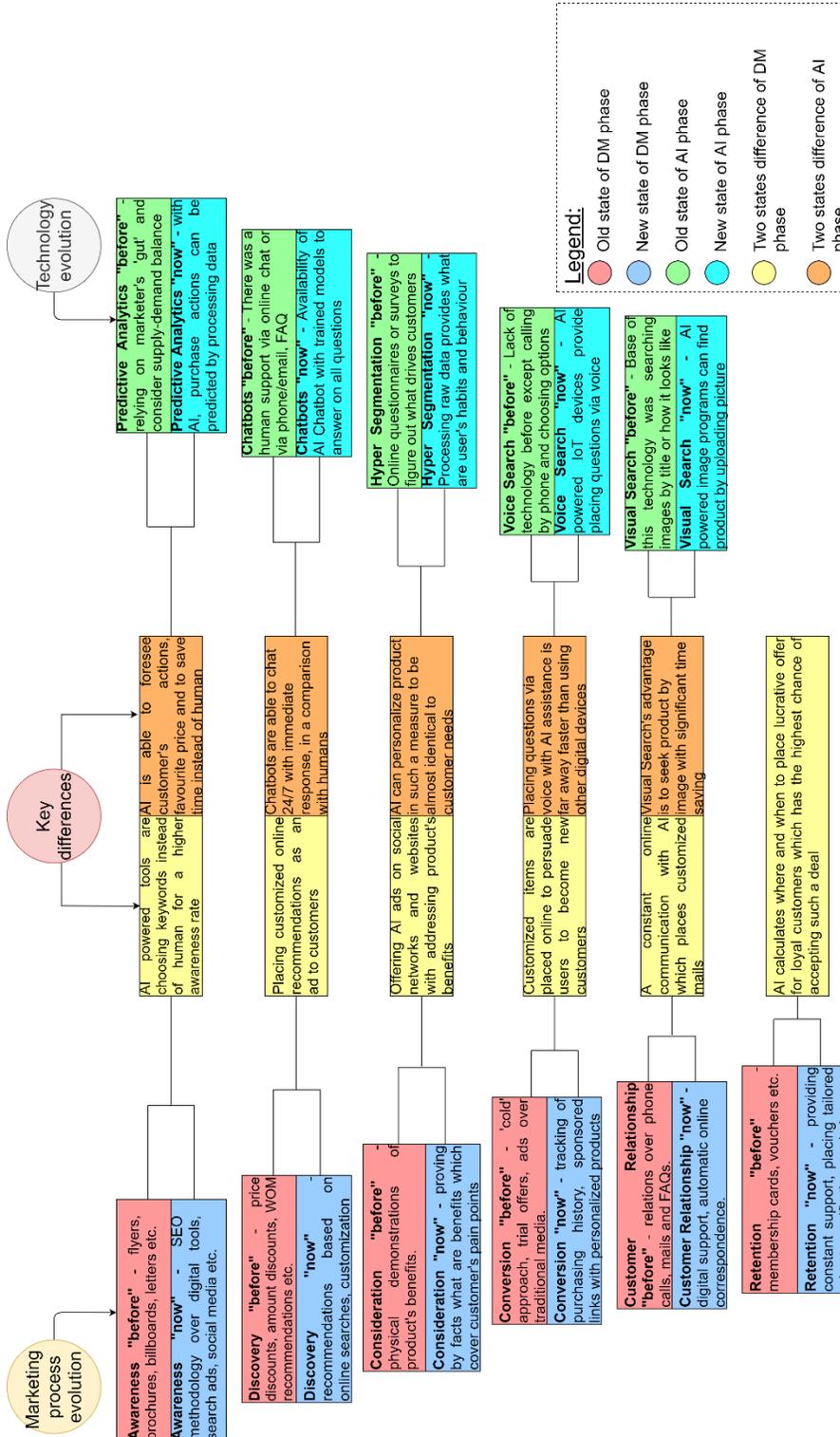


Figure 8. The summary of DM and Technology Evolution, and key differences between before and now conditions

As we can see from Figure 8, every DM and Technology aspect has been represented from how it was before, how it was now, and the key differences. Generally speaking, all DM phases have been used printed media, traditional communication devices, an on-the-spot approach, basic recommendations etc. [80]. These phases have been evolved to the digital environment, i.e. most of the job has been transferred to the AI and its algorithm. In other words, printed media such as flyers, brochures, and leaflets have been replaced with analyzed online ads, which have a spot at a specific time and place. Customers have been persuaded via cold calls or emails to buy a product, promoting an often aggressive approach from the marketing team. However, AI takes care of purchasing history, online behavior, and place-sponsored links to the end-user. Also, communication with customers has occurred via a trained AI model, which takes place instead of traditional sending emails manually by a human [81]. Moreover, marketers were supposed to choose keywords for organic results on search engine platforms regarding SEO. But AI can now do the hard part of the job – by processing raw data, it can filter the most popular keywords and put it in front of marketers to bring data-based decisions [82].

On the other hand, Figure 8 also presents how Technology has been evolved in recent times. We can notice that marketers have primarily relied on their personal feeling and the balance between supply and demand on the market. This approach has been used to predict how people react to the specific product and with potential customer's responses, particular actions have been undertaken [69]. Today, predictive analytics is functioning under AI, where its algorithm predicts what customer's actions are, based on online history data [61]. Customer service has been obtained via phone or email, and it took a lot of time for users to reach support in the specific work time. Nowadays, Chatbots took advantage of communication with customers. Namely, it is trained to simultaneously process several chats within 24/7 availability and provide the same answers as the human [43]. Hyper Segmentation took place in the marketing field by providing a personalized experience to customers compared to traditional surveys and questionnaires. In that way, users have been offered products by their taste thanks to AI, which analyses customers' search history [39]. Considering Voice Search, it has been enhanced with IoT devices, where customers can place a question by voice, saving time and increasing search efficiency [49]. Finally, Visual Search gives us an insight into how a customer can search for a product by just uploading an image, compared to search a product by title, although with a risk of whether the product will be found or not [51].

6. Discussion

This chapter aims to discuss previously presented results, classified by each research question. In other words, the main findings will be discussed, and a comparison with previous research from the standpoint of similarities or differences will be examined as well. After that, a result summary will be introduced – specific technologies which support Digital Marketing. Also, the motivation behind the summary and the instruction of how to read it will be depicted in this chapter. In the end, the limitations of this study will be explained. According to this, the discussion of three research questions will be presented in the following paragraphs:

RQ1: Which approaches of AI are used in Digital Marketing?

RQ2: What aspects or phases of Digital Marketing are impacted using AI?

RQ3: How is AI changing the Digital Marketing processes?

The main findings regarding the first RQ (Research Question) are that Predictive Analytics and Hyper Segmentation have the most decisive impact on Digital Marketing. Companies decide to consider these AI aspects for DM (Digital Marketing) because the former takes significantly less time to process data, it does much more effectively than a human, and it reduces costs in creating marketing campaigns [83]. The latter seems more effective for the companies from the standpoint of the competitive advantage on the market, cost-effective marketing focusing on the specific customer and customer loyalty for the particular tailored product [84]. However, Barry [85] has presented a different conclusion in his work. He found out that marketers are not focusing on all customers, mainly in the predictive and segmentation domain. Instead, companies are focusing only on 20% of customers, which 'target behavior' matches the most with the company's profile. Moreover, he claims that companies have low rate predictions for purchasing or other actions due to the impossibility of including the following factors: customer's current interests and needs, and existing market conditions [85]. Thus, the main difference between these two previously mentioned standpoints is that the first one presented Predictive Analytics and Hyper Segmentation as an effective AI methodology that works in Digital Marketing, proved by facts from the data extraction table. On the contrary, the second standpoint goes with the research, which relies on unprecise prediction power to conclude that marketers should not rely too much on this methodology. On the one hand, it seems that he might be right in terms of the company's opacity to overview current market conditions, so they might not be able to adjust immediately. But, it can be said that Predictive Analytics can be more than adequate in terms of foreseeing customer's behavior and their future actions with a proper amount of dataset.

As opposed to Barry's opinion, Petra [86] claims that the user's structure and personal online profile can be used in the predictive model to foresee the user's behavior. Furthermore, she continues that the predictive behavioral model can provide relevant advertising and set up the right marketing campaign with the suitable ability to identify a targeting profile. Finally, she hits her research with 'Fully automatic Predictive Targeting and modeling real-time of online behavior,' which is represented as a complex and fully automated forecasting model available for use in any segment of Digital Marketing [86]. This research is aligned with the research of this thesis – both standpoints agree that Predictive Analytics has more to offer than we can expect, and it can just

evolve more in the future. Even though Petra's research about the fully automated predictive model is at the very beginning of the development, it might be said that this model could quickly change in promptly changing online market.

Another AI aspect – Chatbots, are fantastic human engagement enablers. They make customer engagement work much more accessible with 24/7 availability and collect essential data from customers instead of humans [87]. Nevertheless, Mina et al. [88] have researched two Web-based chatbots, Rose and Mitsuku, to evaluate conversations with humans. The following results: Chatbots made abrupt transitions from one topic to another without any reason. The system's reply was not what humans would typically say, and they would try to imitate human behavior and tend that they are not machines as well [88]. These results for Chatbot differ from the main findings of this thesis – while most papers presented Chatbots as precise in the communication with customers and tend to be specific in replying, it seems that previous discovery located errors in the Chatbot's pattern. Hence, while the first point of view depicted Chatbots as very effective machines with prompt replies, the second point of view goes with the unnatural interaction with customers. This discrepancy could be attributed to the different datasets which were used in various Chatbots. While some Chatbots could possibly have a more robust and broader dataset, others could be limited with the information derived from customers. In contrast with Mina et al., Aditya et al. [45] have illustrated SamBot, a virtual Chatbot made by Samsung, which base is AIML (Artificial Intelligence Markup Language). This architecture possesses multiple databases about customers and FAQ product files, and it can be implemented on any platform or website. Moreover, SamBot is equipped with speech input, which implies that this Chatbot could recognize the user's voice and react immediately [45]. This standpoint is aligned with most papers from the data extraction table – the Chatbot's path is going in the right direction of its development. Taken together, these results suggest that there is a bright future for Chatbots, and they will grow parallel with AI.

When it comes to the second RQ, judging by results, companies are most focused on investing AI in the next DM approaches: to gain new customers, retain old customers, and make customers on purchase action. In other words, these are Awareness, Discovery, Conversion and Retention aspects. This conclusion comes from the fact that processing a vast amount of data is lucrative from reaching and retaining customers and persuading customers to purchase when necessary based on AI data-driven decisions. Moreover, companies nowadays can harvest plenty of available data online and can be captured with existing technology powered by AI. According to this, Gijs et al. [89] have represented the improved WOM (word of mouth) methodology within DSS ("*Decision Support System is designed for marketing activity. The system is used to help businesses explore different scenarios by manipulating already collected data from the past events [90].*"). It is not easy to foresee the effects of the WOM campaign, which is why companies have implemented DSS to simulate WOM before launching a campaign. The DSS can automatically improve the WOM program by reflecting the newest results, i.e. by harvesting historical data of the customer's impressions. In other words, the DSS provides to marketers valuable information about in which direction to develop Awareness and Discovery phases. Therefore, the AI algorithm incorporated in DSS can test different variations of Awareness and Discover approaches in the marketing campaign, supervise the influence of simulated campaigns, and have more insights about the market before placing the WOM campaign [89]. Furthermore, Gijs et al. [89] have tested

the visual impact on the marketing strategy of the travel agency. Namely, they placed visual analytics on testing the score of hotel images by their potential to attract clicks, and this algorithm would pick pictures with the most immense potential. In this case, the travel agency could rely on a higher Conversion and Retention rate based on the attractiveness of the hotel's and room's pictures [89]. Gijs et al. methodology contributes to the top of the Digital Marketing funnel – spreading the good word will raise the effectiveness of the Awareness and Discovery phases. Furthermore, there might be a high possibility for the visual analytics algorithm of hotel images to work for the Conversion and Retention phases. It might be since in both mentioned cases – WOM program and the visual analytics, AI is implemented and both tasks are automatized, which makes work easier for marketers to come only with the final decision where to direct data. One more research agrees with the previous one – Alex [91] goes with the fact that Digital Marketing phases, powered by AI, have a better chance to reach a high return of investment than without such sophisticated support. He claims that the marketing budget can be saved by 50% thanks to the AI algorithm since human activities are significantly reduced [91]. This claim might be valid because most digital tasks can be forwarded to the AI, while marketers could have a reduced scope of work and perhaps delegate only decisive assignments.

Finally, the third RQ shows a transition and evolution in how AI transformed the Digital Marketing aspects. It can be noticed that this migration from traditional to AI tools and methods records an exponential growth from year to year. Even though marketers heavily relied on traditional advertisement methodologies and firmly believed in their success, the process of embracing new AI technologies and dropping old ones was faster than expected. This is due to the tendency to reach higher productivity within the DM campaign's aims, save time and resources, and reduce human involvement in sturdy tasks [92]. Compared with some past times, AI can now gather unstructured data to clean them and process a specific task. This approach can be eventually applied in every DM aspect – each DM approach considers data-driven decisions [93]. Even more, it seems that AI will transform DM processes within VR/AR in the future. This method can be applied within personalization – VR can offer such an experience to the customer in the purchasing process, or customers could lead a conversation with Chatbots via VR. Thus, this innovative approach could be attractive from the advertisement point of view [94].

In favor of previously presented arguments and facts goes the publication of Xuebing & Zhibin [95], where they thoroughly examined the Chinese market and AI impact on the Digital Marketing process over the past five years. That being said, they have predicted that the new DM process will be composed of four steps: consumer insight discovery, ad creation, media planning and buying, and ad impact evaluation. Such a new process will be much more efficient and tool-based, supported by data-based AI platforms with its algorithms. To support such a claim, researchers have presented the Luban design system. This tool, developed by Alibaba company, can create marketing content with the limited usage of text or pictures; purchasing tools have been used to carry out any buying decision by customers and optimize such actions within seconds. Even though the new process will be improved and upgraded from the traditional marketing process, researchers claim that the new process is still extracted from the traditional one and space for improvements in the future exists [95]. The previously mentioned proofs might not be suitable for all worldwide markets. Researchers focused only on the Chinese and Asian markets. Due to the

cultural differences with other continents, the question remains whether such a new Digital Marketing process would work on other markets or not. It seems possible that all or some of the phases might work since most of them are active in the Digital Marketing process over the globe. Still, some space could be left to think about the different implementations in other countries. Another evidence of changing the Digital Marketing process has been presented by Ming-Hui & Roland [96]. These two researchers have developed a three-stage DM process with incorporated AI: mechanical AI to automate marketing activities, thinking AI for processing data to deliver decision point to marketers, and feeling AI for analyzing interactions and human emotions. All three stages have their role: the first one can be used to segment recognition and standardization within the marketing strategy; the second one for the segment recommendation and personalization; and the last one for segment resonance and relationalization [96]. The authors applied this process in various areas of Digital Marketing and sampling in several multinational companies (Amazon, Domino's pizza, RedBalloon etc.). The findings of this study suggest that there are different views of how Digital Marketing, an AI-powered, process should look like. It might be that the DM process structure could be affected by the area where it operates. On the other hand, one possible implication of this is that AI algorithms could be applied in any DM process, so it is assumed that it could be improved through the time in every segment.

6.1. The summary of results

A number of studies presented in results will be reflected as the summary of results. In the pages that follow, the structure, motivation and readability of the summary will be explained. The summary below has been created to contribute to the development of AI aspects, Digital Marketing aspects, and how AI can, in these circumstances, impact Digital Marketing. Therefore, the summary which captures what and how can be improved in terms of AI and Digital Marketing will be presented in Figure 9:

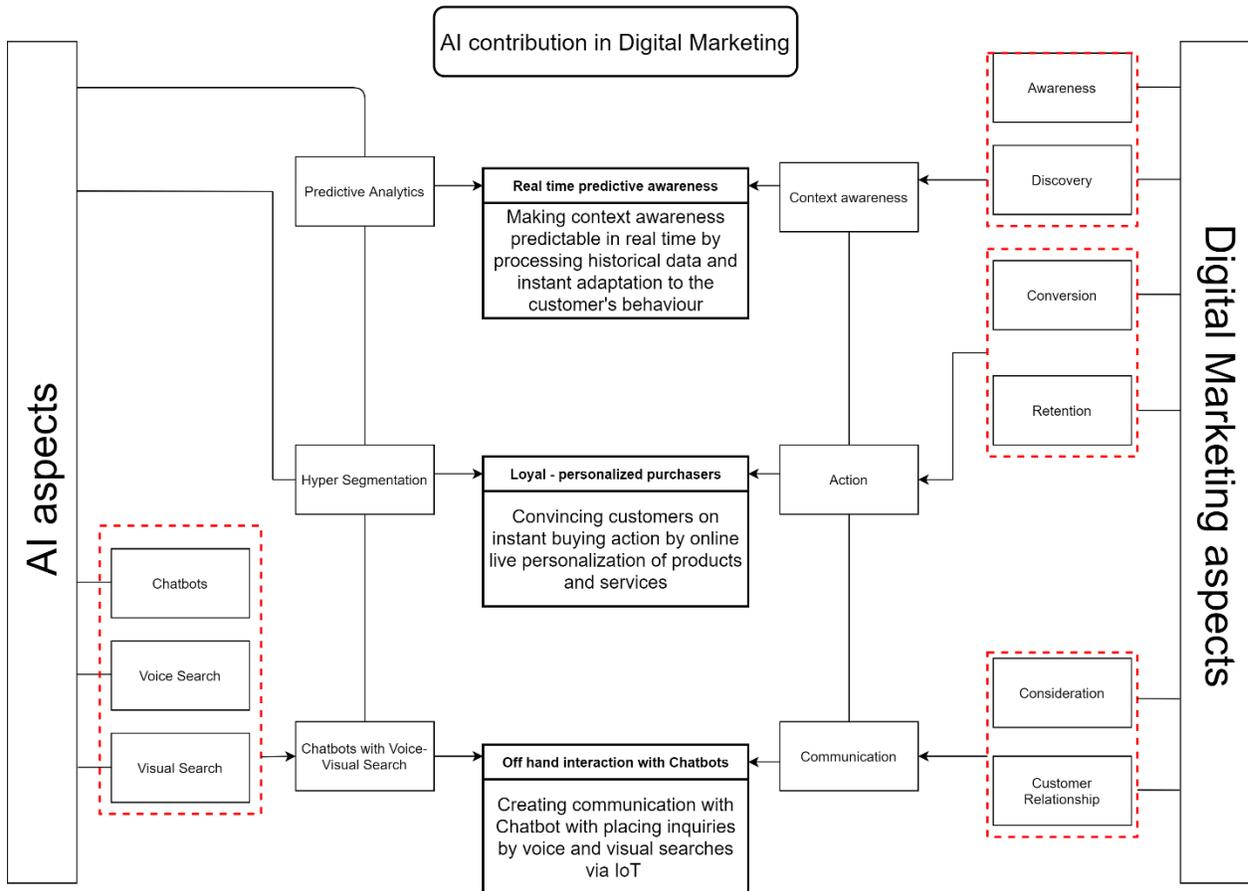


Figure 9. The summary of results of AI and Digital Marketing aspects and AI's contribution in Digital Marketing

What is striking about the elements in this summary is that the AI aspects have been introduced from the left side, and Digital Marketing aspects have been depicted on the right side of the diagram, just as they were stated in the first chapter of this thesis. While considering both the AI and DM aspects of the summary, we can notice that Predictive Analytics, Hyper Segmentation, Chatbots, Voice Search and Visual Search have been presented within the AI aspects. On the contrary, Digital Marketing aspects have been depicted with Awareness, Discovery, Consideration, Customer Relationship, Conversion and Retention aspects. Nevertheless, Chatbots, Voice Search and Visual Search on the right side of the diagram have spawned Chatbots with Voice-Visual Search. Then, the Awareness and Discovery aspects merged to the Context-awareness; Conversion

and Retention aspects went to the Action aspect; and Consideration and Customer Relationship aspects make the Communication aspect.

Moving on to the 'AI contribution in Digital Marketing' part at the middle of the diagram, where it is shown how AI aspects can specifically contribute to the Digital Marketing aspects and to deliver value for marketers. In other words, Predictive Analytics influences the Context-awareness aspect and delivers 'Real-time predictive awareness' value; Hyper-Segmentation influences the Action aspect and delivers 'Loyal-personalized purchasers' value; Chatbots with Voice-Visual Search affects Communication aspect and delivers 'Offhand interaction with Chatbots' value.

The motivation for this summary of results appearance and functionality comes from simplifying both AI and Digital Marketing aspects and placing concrete steps where AI can impact Digital Marketing in the future by delivering tangible values to marketers. The clustering from Chatbots, Voice Search and Visual Search to 'Chatbots with Voice-Visual Search' comes from the increased need for Voice Search via IoT and easy interaction with Chatbots. To support this claim, it can be said that now it is possible to do Visual Search by voice – sending voice inquiries to the Chatbot via IoT to search for a specific image that matches the company's product [97]. On the other side of the diagram, from the Awareness and Discovery aspects, a 'Context-awareness' aspect has been derived. It came from the growing need to automatize collecting information from customer's environments anytime and tailor business needs with their behavior [58]. Next, Consideration and Customer Relationship merged to the 'Communication.' The need for this merging comes from the need to address customers' needs, problems and service information more effectively and lead them easily through the companies' online channels and e-commerce website [98]. Finally, the Conversion and Retention aspects have emerged the 'Action' aspect. The necessity of this linking is to provide the best purchasing experience, which will spawn the effect of purchasing to delight a customer for repeating the same action [99].

Continuing with the AI contribution in Digital Marketing, clustered aspects from both AI and Digital Marketing have been connected among each other: Predictive Analytics with Context-awareness; Hyper-Segmentation with Action aspect; and Chatbots with Visual and Voice search with Communication aspect. The main idea is to deliver a value that could be significant for marketers thanks to the collaboration between one AI and one Digital Marketing aspect. Thus, the Context-awareness aspect goes with Predictive Analytics, making a connection called Real-time predictive awareness. The fundamental conception of this contribution comes from analyzing customers' behavior to provide personalized services based on historical data. The efficient context-aware system uses multidimensional contextual data to predict user's actions in a real-time environment, so the AI algorithm could promptly adapt to sudden changes [100]. Next, the correlation between Hyper-Segmentation and Action aspects can be seen as 'Loyal-personalized purchasers.' This binding comes from idea to create the best and most convincing personalized experience for customers to buy a product that is instantly customized by their needs. In this way, they are more connected with the brand, making loyal users permanent. Finally, 'Offhand interaction with Chatbots' comes as a compound between Chatbots with Voice-Visual Search and Communication aspects. This conception takes the form of Visual – Voice communication between the customer and AI device. In other words, customers can find out more about the product or making a stronger

bond with the company by placing verbal or verbal-visual inquiries via IoT supported with a Chatbot [97].

6.2. Limitations of the Study

Even though the conducted study, which was obtained within SLR methodology, has been shown as very effective, there are some limitations of the study. The first one is a **Restricted time span**, which is defined as a timeframe where researchers are limited with the specific number of papers to find [101]. As mentioned in the SLR methodology chapter, the research has been conducted from 2015 and not before that date. Although this limitation provided the newest information about AI and Digital Marketing, it must be said that there would be a higher number of reports if the timeline has been expanded. This limitation has been solved by finding a compromise where the time span would balance the quality and up-to-date information in the domain of the thesis topic and enough papers stated from 2015. The second one is **Inaccessible paper**, which means the impossibility to access the paper or contact the author [101]. While most of the papers have provided open access, some very eligible papers were not publicly available. Some of them were expensive, and for others, publishers did not respond to give access. This issue has been solved by inputting <http://www.sci-hub.se/> in front of the URL address of the paper in the search engine. In this way, a previously mentioned piece of the URL has bypassed the restriction in most cases. The third limitation is **Study duplication**, defined as the same paper covered by more than one website or source [101]. Many found papers were duplicates, i.e. several different sources have represented the same paper. This anomaly has been solved by removing duplicates from the database. The final restriction of the study is **Publication bias**, which was referred to as papers that are more likely to present positive than negative results [101]. Therefore, in extracting data, a higher number of papers were presented in a positive than in a negative manner. This issue has been annulated by a thorough check of papers to validate the suitability of every study.

7. Conclusion

This research aimed to identify the impact of AI on Digital Marketing. In a broader sense, the purpose of the current study was to examine which AI aspects can be useful for Digital Marketing, which Digital Marketing aspects can be susceptible to the AI effect and how AI supports the evolution of Digital Marketing processes.

The protocol of answering above mentioned examinations has started with a Systematic Literature Review (SLR). In this phase, Review Motivation and Research Questions have been first presented. Then Search Strings and Selection Criteria have been defined. After that, the Screening Procedure was placed to discover which papers are eligible to take into consideration. Next, the Data Extraction Form with requirements has been established to classify papers by specific criteria. After fulfilling the data extraction table and examining all filtered papers, research questions have been answered and presented in the Results chapter. Finally, in the Discussion chapter, results have been disserted and explained more in detail, comparing with other academic papers as well, and a summary of results has been presented as well.

The present study made several contributions to the current research. First, several AI aspects have been examined in detail to reveal which ones have the most significant value to Digital Marketing aspects. In this way, five AI aspects have been detected and proved as most promising to the growth of Digital Marketing aspects: Predictive Analytics, Hyper-Segmentation, Chatbots, Visual Search and Voice Search. Second, various Digital Marketing aspects have been investigated to determine which ones are most adaptable to the AI impact. That being said, six Digital Marketing aspects have been demonstrated as the most certain ones susceptible to the AI influence: Awareness, Discovery, Consideration, Conversion, Customer Relationship and Retention phases. The third contribution relates to the Digital Marketing process – it has been discovered and examined how AI will direct the DM process and how it could appear with AI support.

A clear benefit can be used by those persons of interest working within the Digital Marketing field, businesspeople interested in the AI field, and developers who are keen to find out how AI data analytics can be used in Digital Marketing.

Several limitations to this study need to be acknowledged. Those are Restricted time span, defined as papers limited with the timeframe, which has been annulated by balancing the quality and time credibility of papers; then Inaccessible paper, which means the paper without the possibility for open access, hence the paper become readable by the input of short URL in search engine; the third limitation was Study implication, which was referred to duplicated papers – this anomaly has been solved by removing duplicates. The final limitation is Publication bias, which means that positive papers are more reflected than negative ones – this issue has been concluded by detailed testing of paper convenience.

This research has thrown up some questions in need of further investigation. Further study might explore more advanced predictive and personalized approaches. Also, more research is needed to account for the more effective and narrowed DM aspects. Finally, it would be interesting to examine which DM, AI-powered, process would be the most productive among presented ones.

References

1. The Evolution of Digital Marketing: 30 Years in the Past & Future. (2020). Retrieved 01 December 2020, from <https://digitalmarketinginstitute.com/blog/the-evolution-of-digital-marketing-30-years-in-the-past-and-future>
2. Hmeid, R. (2017). What Does "Being Digital" Actually Mean?. Retrieved 25 October 2020, from <https://www.infoq.com/articles/meaning-being-digital/>
3. Digital marketing. (2017). Retrieved 25 October 2020, from https://en.wikipedia.org/wiki/Digital_marketing#cite_note-1
4. Bruyn, A., Viswanathan, V., Beh, Y., Brock, J., & Wangenheim, F. (2020, June 28). Artificial Intelligence and Marketing: Pitfalls and Opportunities. Retrieved October 25, 2020, from <https://www.sciencedirect.com/science/article/abs/pii/S1094996820300888>
5. Springfield, T. (2019). How is Artificial Intelligence Revolutionizing Digital Marketing?. Retrieved 2 November 2020, from <https://medium.com/swlh/how-is-artificial-intelligence-revolutionizing-digital-marketing-c17dbb73f121>
6. Palmere, T. (2020). How to Use Artificial Intelligence in Digital Marketing. Retrieved 2 November 2020, from <https://blog.wishpond.com/post/115675437788/ai-in-digital-marketing#:~:text=Artificial%20intelligence%20is%20transforming%20customer,provide%20customer%20services%20to%20users.>
7. Impact of Artificial Intelligence in Digital Marketing. (2020). Retrieved 2 November 2020, from <https://www.nihtdigitalmarketing.com/blog/artificial-intelligence-in-digital-marketing/>
8. Goldberg, L., & Goldberg, L. (2018). A brief history of artificial intelligence in advertising – Econsultancy. Retrieved 2 November 2020, from <https://econsultancy.com/a-brief-history-of-artificial-intelligence-in-advertising/>
9. Karlson, K. (2017). 8 Ways Intelligent Marketers Use Artificial Intelligence. Retrieved 2 November 2020, from <https://contentmarketinginstitute.com/2017/08/marketers-use-artificial-intelligence/>
10. Ayyar, R., 2020. How To Use AI At Each Step Of The Customer Journey. [online] Target Marketing. Available at: <<https://www.targetmarketingmag.com/post/how-to-integrate-ai-tech-into-each-step-of-the-customer-journey/>> [Accessed 29 October 2020].
11. Deane, M. (2020). How artificial intelligence will impact digital marketing in 2020. Retrieved 2 November 2020, from <https://blog.spendesk.com/en/artificial-intelligence-digital-marketing>
12. Godin, K., Stapleton, J., Kirkpatrick, S.I. et al. Applying systematic review search methods to the grey literature: a case study examining guidelines for school-based breakfast programs in Canada. *Syst Rev* 4, 138 (2015). <https://doi.org/10.1186/s13643-015-0125-0>
13. Monnappa, A. (2020). The History and Evolution of Digital Marketing. Retrieved 17 November 2020, from <https://www.simplilearn.com/history-and-evolution-of-digital-marketing-article#:~:text=The%20term%20Digital%20Marketing%20was,this%20information%20over%20the%20web.>
14. Redd, W. (2017). A Brief History of Digital Marketing. Retrieved 17 November 2020,

- from <https://www.socialchimp.com/blog/history-of-digital-marketing/>
15. Digital Marketing. (2017). Retrieved 17 November 2020, from https://en.wikipedia.org/wiki/Digital_marketing#cite_note-2
 16. Colicev, A., Kumar, A., & O'Connor, P. (2018). Modeling the relationship between firm and user generated content and the stages of the marketing funnel. Retrieved 19 December 2020, from <https://www.sciencedirect.com/science/article/abs/pii/S0167811618300508>
 17. Deiss, R., & Henneberry, R. (2017). Digital Marketing For Dummies | Guide books. Retrieved 19 December 2020, from <https://dl.acm.org/doi/book/10.5555/3137518>
 18. Machado, C., & Davim, J. (2016). MBA - Theory and Application of Business and Management Principles | Carolina Machado | Springer. Retrieved 19 December 2020, from <https://www.springer.com/gp/book/9783319282794>
 19. Iliuta Negricea, C., & Matei Purcarea, I. (2016). Engineering the Digital Transformation of Marketing. Retrieved 19 December 2020, from https://www.researchgate.net/publication/343162469_Engineering_the_Digital_Transformation_of_Marketing
 20. Hausman, A. (2020). 6 Stages in the Digital Marketing Funnel: Lead Nurturing that Creates ROI. Retrieved 19 December 2020, from https://www.hausmanmarketingletter.com/5-stages-digital-marketing-funnel/#Exposure_awareness
 21. The marketing funnel: A shift from traditional to digital marketing. (2019). Retrieved 18 November 2020, from <https://blog.raak.be/the-marketing-funnel-a-shift-from-traditional-to-digital-marketing>
 22. Goldberg, L. (2018). A brief history of artificial intelligence in advertising – Econsultancy. Retrieved 19 November 2020, from <https://econsultancy.com/a-brief-history-of-artificial-intelligence-in-advertising/>
 23. Faculty of Computer Science – Belgrade. Razlika između veštačke inteligencije i mašinskog učenja (Difference between AL and ML) (2020). Retrieved 19 November 2020, from <https://www.raf.edu.rs/en/36-citaliste/najnoviji-it-dogadjaji/4500-razlika-izmedu-vestacke-inteligencije-i-masinskog-ucenja>
 24. Palmere, T. (2020). How to Use Artificial Intelligence in Digital Marketing. Retrieved 2 November 2020, from <https://blog.wishpond.com/post/115675437788/ai-in-digital-marketing#:~:text=Artificial%20intelligence%20is%20transforming%20customer,provide%20customer%20services%20to%20users.>
 25. Coleman, M. (2020). Artificial Intelligence in Marketing: 5 Types of AI Impacting Digital Marketing. Retrieved 19 November 2020, from <https://www.amplimark.com/artificial-intelligence-in-marketing-5-types-of-ai-impacting-digital-marketing/>
 26. Dania Todor, R. (2016). Blending traditional and digital marketing. Retrieved 24 November 2020, from http://webbut.unitbv.ro/BU2016/Series%20V/2016/BULETIN%20I%20PDF/06_Todor%20R.pdf
 27. Charlesworth, A. (2018). Digital marketing: A practical approach 3rd edition. Retrieved 20 December 2020, from <https://www.worldcat.org/title/digital-marketing-a-practical-approach/oclc/1031832664?referer=di&ht=edition>
 28. K. Theodoridis, P., & C. Gkikas, D. (2019). 1322. Retrieved 24 November 2020, from https://link.springer.com/chapter/10.1007/978-3-030-12453-3_151

29. Wirth, N. (2018). Hello marketing, what can artificial intelligence help you with?. Retrieved 24 November 2020, from <https://journals.sagepub.com/doi/abs/10.1177/1470785318776841>
30. Soldani, J., Tamburri, D., & Van Den Heuvel, W. (2018). The pains and gains of micro-services: A Systematic grey literature review. <https://www.sciencedirect.com/>. Retrieved 5 May 2021, from <https://www.sciencedirect.com/science/article/abs/pii/S0164121218302139?via%3Dihub>
31. Godin, K., Stapleton, J., Kirkpatrick, S., Hanning, R., & Leatherdale, S. (2015). Applying systematic review search methods to the grey literature: a case study examining guidelines for school-based breakfast programs in Canada. <https://systematicreviewsjournal.biomedcentral.com/>. Retrieved 5 May 2021, from <https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/s13643-015-0125-0>.
32. Kitchenham, B., & Charters, S. (2007). Guidelines for performing Systematic Literature Reviews in Software Engineering | BibSonomy. <https://www.bibsonomy.org/>. Retrieved 5 May 2021, from <https://www.bibsonomy.org/bibtex/aed0229656ada843d3e3f24e5e5c9eb9>.
33. A Guide to Conducting a Standalone Systematic Literature Review. <https://aisel.aisnet.org/>. (2015). Retrieved 5 May 2021, from <https://aisel.aisnet.org/cais/vol37/iss1/43/>.
34. Xue, J. (2019). How to Use Predictive Analytics for Better Marketing Performance. Single Grain. Retrieved 17 March 2021, from <https://www.singlegrain.com/digital-marketing-analytics/how-to-use-predictive-analytics-for-better-marketing-performance/>
35. Pathak, R. (2020). The Importance of Predictive Analytics in the Era of Digital Marketing. Digital Doughnut. Retrieved 17 March 2021, from <https://www.digitaldoughnut.com/articles/2020/july-2020/the-importance-of-predictive-analytics#:~:text=The%20predictive%20analytics%20mechanism%20helps,the%20risk%20of%20campaign%20failure.&text=For%20example%2C%20an%20ecommerce%20leader,hence%20they%20see%20significant%20ROI>.
36. How to Win Tomorrow's Car Buyers – Artificial Intelligence in Marketing & Sales. <https://www.mckinsey.com/>. (2019). Retrieved 17 March 2021, from <https://www.mckinsey.com/~media/mckinsey/industries/automotive%20and%20assembly/our%20insights/winning%20tomorrows%20car%20buyers%20using%20artificial%20intelligence%20in%20marketing%20and%20sales/how-to-win-tomorrows-car-buyers-artificial-intelligence-in-marketing-and-sales-final.ashx>.
37. Vallaey's, F. (2019). Read Digital Marketing in an Ai World Online by Frederick Vallaey's | Books. Scribd. Retrieved 17 March 2021, from <https://www.scribd.com/book/409190609/Digital-Marketing-in-an-Ai-World-Future-proofing-Your-Ppc-Agency>.
38. Lebo, T. (2019). Hyper-Personalization: What It Is and Why You Need It in Your 2019 Marketing. <https://www.convinceandconvert.com/>. Retrieved 19 March 2021, from <https://www.convinceandconvert.com/research/hyper-personalization/>.
39. AI powered customer profiling to boost your in-store sales. <https://accubits-tech.medium.com/>. (2020). Retrieved 19 March 2021, from <https://accubits-tech.medium.com/ai-powered-customer-profiling-to-boost-your-in-store-sales-1946a3ad1dee>.

40. Coleman, M. (2020). Artificial Intelligence in Marketing: 5 Types of AI Impacting Digital Marketing. Retrieved 17 March 2021, from <https://www.amplimark.com/artificial-in-telligence-in-marketing-5-types-of-ai-impacting-digital-marketing/>
41. Karimova, G. (2019). Marketing Artificial Intelligence: Creating the AI Archetype for evoking the personality trust. <https://www.abacademies.org/>. Retrieved 19 March 2021, from <https://www.abacademies.org/articles/Marketing-artificial-intelligence-creating-the-ai-archetype-for-evoking-the-personality-trust-1528-2678-23-4-239.pdf>.
42. Voracek, D. (2017). The application of artificial intelligence and machine learning in e-commerce, its adoption requirements and areas of improvement (Bachelor Studies). University of New York in Prague: School of Business, Retrieved 19 March 2021, from https://elearning.unyp.cz/pluginfile.php/58141/mod_data/content/5950/Voracek%2C%20David%20%28517500%29%20-%20Final%20Project%20Thesis.pdf
43. Frankenfield, J. (2020). Chatbot. <https://www.investopedia.com/>. Retrieved 19 March 2021, from <https://www.investopedia.com/terms/c/chatbot.asp>.
44. How Does A Chatbot Work? Chatbots Learning Center | Drift. <https://www.drift.com/>. (2019). Retrieved 5 May 2021, from <https://www.drift.com/learn/chatbot/how-does-a-chatbot-work/>.
45. Pradana, A., Ong Sing, G., & Jaya Kumar, Y. (2017). SamBot - Intelligent Conversational Bot for Interactive Marketing with Consumer-centric Approach. Retrieved 6 April 2021, from http://mirlabs.org/ijcisim/regular_papers_2017/IJCISIM_61.pdf
46. Voice search - Wikipedia. <https://en.wikipedia.org/>. (2018). Retrieved 20 March 2021, from https://en.wikipedia.org/wiki/Voice_search.
47. Optimizing for voice search: Keyword generation and relevance development | Smart Insights. <https://www.smartinsights.com/>. (2020). Retrieved 20 March 2021, from <https://www.smartinsights.com/digital-marketing-strategy/optimizing-for-voice-search/#:~:text=As%20the%20name%20suggests%2C%20voice,the%20future%20of%20online%20marketing%3F>.
48. Patel, N. (2020). Type No More: How Voice Search is Going to Impact the SEO Landscape. <https://neilpatel.com/>. Retrieved 20 March 2021, from <https://neilpatel.com/blog/type-no-more-how-voice-search-is-going-to-impact-the-seo-landscape/>.
49. McKinney, J. (2020). Everything You Need To Know About Voice Search - Wpromote. <https://www.wpromote.com/>. Retrieved 20 March 2021, from <https://www.wpromote.com/blog/seo/everything-you-need-to-know-about-voice-search/#:~:text=Voice%20search%20is%20the%20action,command%20or%20answers%20the%20question>.
50. Tiautrakul, J., & Jindakul, J. (2019). Famous People Media Through the Use of Artificial Intelligence in Digital Marketing. <https://papers.ssrn.com/>. Retrieved 20 March 2021, from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3405188.
51. Fryman, L. (2019). 5 Ways Visual Search Will Change the Way You Market. <https://blog.hubspot.com/>. Retrieved 21 March 2021, from <https://blog.hubspot.com/marketing/visual-search-will-change-marketing#:~:text=Visual%20search%20is%20an%20artificial,a%20picture%2C%20rather%20than%20keywords.&text=The%20user%20is%20then%20served,is%20most%20similar%20to%20it>.

52. What is Brand awareness? A definition | Glossary. (2020). Retrieved 24 March 2021, from <https://www.bynder.com/en/glossary/brand-awareness/>
53. Allouch, N. (2018). How to Attract and Engage Your Audience at the Awareness Stage. Retrieved 24 March 2021, from https://customerthink.com/how-to-attract-and-engage-your-audience-at-the-awareness-stage/?_cf_chl_jschl_tk_=e98017063a0c4806f696ea36dd0ea0cd309967ad-1616621682-0-AZnxa8phI0Dfjzh37ixngbX64Qa8ggyNuqfONXKgcLlsAgNoDjbFh0zn-s-c8KehYld38CYB20Rk47eKu0NN0oLqw-2H-XKIAz_FBv0-7jUoKllg3d3OR-jldXTHQ7dR9aHFdgPfOcPXVnKRccH38WBy6n-UnRD6V405_7VHGqRfBg0vXqxcK6x41dOida11VX2WkaY-fMVwyis9Zs58EHipXFzuS7hFa2CGJgt2uwoyc88gUtIy1XQvWePAtyXs3G8-yS-jhy-Sk03MOtfaoS4r8Me1afLkr7apSGkTz-FEcr8J9Rushbd0GXIAWMMd4VSHWuOZasv0ddZnge5DKnbw6We472g2qK8bEkt3vJ806ldgPJkkD1zo7zjSeen4rMSnF70JooyNY5c0F6VOBnika
54. Social Media Marketing with AI-Driven Solutions in 2019. (2019). Retrieved 24 March 2021, from <https://pages.grazitti.com/rs/690-NGB-767/images/Improve-Your-Social-Media-Marketing-with-AI-Driven-Solutions-in-2019.pdf>
55. Discovery Phase: What is it and why is it essential?. (2017). Retrieved 24 March 2021, from <https://www.theeword.co.uk/blog/discovery-phase-what-is-it-and-why-is-it-essential/#:~:text=Discovery%20is%20a%20phase%20of,what%20purpose%20each%20element%20serves.>
56. Consideration Set in Marketing: Definition & Example. (2017). Retrieved 29 March 2021, from <https://study.com/academy/lesson/consideration-set-in-marketing-definition-example.html>
57. Shuteyev, P. (2021). Awareness, Consideration & Decision: How To Convert At Each Stage. Retrieved 29 March 2021, from <https://snov.io/blog/awareness-consideration-decision-what-to-convert-with-at-each-stage/>
58. Davenport, T., Guha, A., Grewal, D., & Bressgott, T. (2019). How artificial intelligence will change the future of marketing. Retrieved 29 March 2021, from https://ide.mit.edu/sites/default/files/publications/2019_Article_HowArtificialIntelligenceWillC.pdf
59. Balmaceda, K. (2019). Digital Marketing Funnel: How To Create Content For Every Stage. Retrieved 29 March 2021, from <https://piktochart.com/blog/digital-marketing-funnel/#:~:text=The%20conversion%20stage%20is%20where,crucial%20at%20the%20conversion%20stage.>
60. Conversion Marketing: Top 10 Strategies To Boost Digital Marketing Conversion Rates In 2021. (2020). Retrieved 29 March 2021, from <https://www.designrush.com/trends/conversion-marketing>
61. Dimitrieska, S., Stankovska, A., & Efremova, T. (2018). Artificial Intelligence and Marketing. Retrieved 29 March 2021, from <http://ep.swu.bg/images/pdfarticles/2018/ARTIFICIAL%20INTELLIGENCE%20AND%20MARKETING.pdf>
62. Buttle, F., & Maklan, S. (2015). Customer Relationship Management - Concepts and Technologies (3rd ed., p. 25). New York: Routledge.

63. Wlosik, M. (2021). What Is a CRM and How Does It Work? - Clearcode Blog. Retrieved 2 April 2021, from <https://clearcode.cc/blog/how-does-crm-work/#:~:text=A%20DEVELOPMENT%20QUOTE-,What%20Does%20a%20CRM%20Do%3F,collects%20information%20about%20the%20customer>.
64. Heimo, J. (2019). Marketer's Guide to the Algorithm Using Machine Learning to Enhance Marketing (Bachelor). Aalto University- School of Business, from https://aalto-doc.aalto.fi/bitstream/handle/123456789/39578/bachelor_Heimo_Jyri_2019.pdf?sequence=1&isAllowed=y
65. Your Complete Guide to Retention Marketing - Alexa Blog. (2018). Retrieved 2 April 2021, from <https://blog.alexablog.com/retention-marketing/#:~:text=Retention%20marketing%20is%20a%20strategy,already%20connected%20to%20a%20brand>.
66. Hausman, A. (2020). 6 Stages in the Digital Marketing Funnel: Lead Nurturing that Creates ROI. Retrieved 19 December 2020, from https://www.hausmanmarketingletter.com/5-stages-digital-marketing-funnel/#Exposure_awareness
67. Harnois, J. (2021). AI, the Future of Successful Digital Marketing. Retrieved 3 April 2021, from http://bisstudents.cratercomets.com/student_portfolios/class_of_2021/harnois_jake_portfolio/documents/Ai%20essay.pdf
68. Kulkarni, R., & Gajul, S. (2015). Emarketing Techniques using Data Mining Approach. Retrieved 7 April 2021, from <https://www.ijarce.com/upload/2015/october-15/IJARCE%20126.pdf>
69. Bayoude, K., Ouassit, Y., Ardchir, S., & Azouazi, M. (2018). How Machine Learning Potentials are transforming the Practice of Digital Marketing: State of the Art. Retrieved 3 April 2021, from <https://pdfs.semanticscholar.org/5de5/4afc5f920e15de14fc621bdff3a780b7a2b5.pdf>
70. World Class lessons on AI Marketing. (2018). Retrieved 7 April 2021, from <http://kurio.fi/v2/wp-content/uploads/2018/11/World-Class-Lessons-on-AI-in-Marketing-Cannes-Lions-x-Kurio-2018.pdf>
71. Wirth, K., & Sweet, K. (2017). One-to-one personalization in the age of Machine Learning. Retrieved 4 April 2021, from https://www.evergage.com/wp-content/uploads/2017/10/One_to_One_Personalization_Book_.pdf
72. Artificial Intelligence Marketing: How Marketer And Machine Will Learn To Work Together. (2018). Retrieved 4 April 2021, from <https://irp-cdn.multiscreensite.com/d2e4655b/files/uploaded/Whitepaper-Marketer-Machine.pdf>
73. Ranjan Mohapatra, M., Mohapatra, S., & Ranjan Mohanty, J. (2018). Artificial Intelligence (AI) 's Role in Search Engine Optimization (SEO). Retrieved 3 April 2021, from [http://www.ijesi.org/papers/Vol\(7\)i5/Version-5/L0705057679.pdf](http://www.ijesi.org/papers/Vol(7)i5/Version-5/L0705057679.pdf)
74. Jain, P., & Aggarwal, K. (2020). Transforming Marketing with Artificial Intelligence. Retrieved 7 April 2021, from <https://www.irjet.net/archives/V7/i7/IRJET-V7I7694.pdf>
75. Machine learning applications in operations management and digital marketing. (2019). Retrieved 3 April 2021, from <https://abs.uva.nl/binaries/content/assets/subsites/amsterdam-business-school/research/dissertations/thesis-q.-wang---abs-2019.pdf>

76. The AI revolution is coming - Are marketers ready?. (2018). Retrieved 3 April 2021, from <https://www.accenture.com/acnmedia/PDF-127/Accenture-and-Microsoft-AI-Revolution.pdf>
77. Raben, N. (2019). Artificial Intelligence: The next disrupting technology of Online Marketing. Retrieved 9 April 2021, from https://essay.utwente.nl/78557/1/Raben_BA_BMS.pdf
78. Frigh, D., & Dahl, T. (2019). A consumer perspective of personalized marketing An exploratory study on consumer perception of personalized marketing and how it affects the purchase decision making. Retrieved 9 April 2021, from <http://www.diva-portal.org/smash/get/diva2:1333116/FULLTEXT01.pdf>
79. Pineda, E. (2020). How AI-driven personalization and human creativity make a winning pair -. Retrieved 9 April 2021, from <https://frosmo.com/how-ai-driven-personalization-and-human-creativity-make-a-winning-pair/>
80. Sorrentino, D. (2021). Marketing Assets for Every Stage of the Sales Funnel (Examples + Infographic) | Braffton. Retrieved 19 April 2021, from <https://www.braffton.com/blog/creation/marketing-assets-for-every-stage-of-the-sales-funnel-examples/>
81. Khokhar, P. (2021). Evolution Of Artificial Intelligence In Marketing, Comparison With Traditional Marketing. Retrieved 19 April 2021, from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3557091
82. Kaput, M. (2019). How to Use Artificial Intelligence in SEO. Retrieved 19 April 2021, from <https://www.marketinginstitute.com/blog/how-to-use-artificial-intelligence-in-seo>
83. The Importance of Predictive Analytics in Sales and Marketing. (2019). Retrieved 25 April 2021, from <https://www.tpptechnology.com/predictive-analytics-in-machine-learning-benefits-of-predictive-analytics-for-businesses>
84. Engholm, F. (2019). Market Segmentation: Why So Important?. Retrieved 25 April 2021, from <https://medium.com/@folkeviralaccess/market-segmentation-why-so-important-88273ffa1917>
85. Leventhal, B. (2016). All Models are Wrong but Some are Useful: the Use of Predictive Analytics in Direct Marketing. Retrieved 25 April 2021, from <https://www.tandfonline.com/doi/abs/10.1080/16843703.2015.11673369?su-bid1=20210426-0112-35af-b91c-2aa616cda0d3>
86. Perner, P. (2019). Data Mining in Marketing. <http://www.ibai-publishing.org/>. Retrieved 4 May 2021, from http://www.ibai-publishing.org/html/proceedings_2019/pdf/workshop_proceedings_book_dmm_2019.pdf
87. Agrawal, S. (2021). How Chatbots are Important for Your Digital Marketing Strategy. Retrieved 25 April 2021, from <https://www.smallbusinessbonfire.com/chatbots-digital-marketing-strategy/#:~:text=Automate%20Your%20Digital%20Marketing%20Process&text=Chatbots%20are%20the%20great%20human,the%20necessary%20information%20from%20them.>
88. Park, M., Aiken, M., & Salvador, L. (2019). How do Humans Interact with Chatbots?: An Analysis of Transcripts. Retrieved 25 April 2021, from <https://core.ac.uk/download/pdf/322474807.pdf>

89. Overgoor, G., Chica, M., Rand, W., & Weishampel, A. (2019). Letting the Computers Take Over: Using AI to Solve Marketing Problems - Gijs Overgoor, Manuel Chica, William Rand, Anthony Weishampel, 2019. <https://journals.sagepub.com/>. Retrieved 5 May 2021, from <https://journals.sagepub.com/doi/10.1177/0008125619859318>.
90. Marketing decision support system - Wikipedia. https://en.wikipedia.org/wiki/Marketing_decision_support_system. (2019). Retrieved 1 May 2021, from https://en.wikipedia.org/wiki/Marketing_decision_support_system.
91. Mari, A. (2019). The rise of Machine Learning in Marketing - Goal, process, and benefit of AI-Driven Marketing. Groupmp15170118135410.blob.core.windows.net. Retrieved 4 May 2021, from https://groupmp15170118135410.blob.core.windows.net/cmscontent/2019/05/The-Rise-of-Machine-Learning-in-Marketing_Research-Report_Alex-Mari_2019.pdf.
92. YS, T. (2020). AI is transforming digital marketing faster than ever. Here's how medium businesses can benefit from it. Retrieved 25 April 2021, from <https://your-story.com/2020/10/ai-transforming-digital-marketing-benefit-medium-businesses>
93. Pathak, R. (2019). How Artificial Intelligence is Changing the Landscape of Digital Marketing. Retrieved 25 April 2021, from <https://www.entrepreneur.com/article/339837#:~:text=AI%20technology%20evolving%20every%20aspect,tracking%20and%20reporting%20and%20more>.
94. How AI is transforming the future of digital marketing | Smart Insights. (2020). Retrieved 25 April 2021, from <https://www.smartinsights.com/managing-digital-marketing/how-ai-is-transforming-the-future-of-digital-marketing/>
95. Qin, X., & Jiang, Z. (2019). The Impact of AI on the Advertising Process: The Chinese Experience. <https://www.tandfonline.com/>. Retrieved 1 May 2021, from <https://www.tandfonline.com/doi/abs/10.1080/00913367.2019.1652122?subid1=20210502-0648-3926-920d-c196b33746c0>.
96. Huang, M., & Rust, R. (2020). A strategic framework for artificial intelligence in marketing. <https://link.springer.com/>. Retrieved 4 May 2021, from <https://link.springer.com/article/10.1007/s11747-020-00749-9?subid1=20210505-0212-0969-9512-47ffa2bedd32>.
97. Why voice-enabled Chatbot is the future of Internet?. Medium. (2019). Retrieved 27 April 2021, from <https://chatbotsjournal.com/why-voice-enabled-chatbot-is-the-future-of-internet-29326af705d3>.
98. What is an Inbound Marketing Funnel. <https://www.bristolstrategy.com/>. (2020). Retrieved 3 May 2021, from <https://www.bristolstrategy.com/what-is-an-inbound-marketing-sales-funnel>.
99. Villaseca, D. (2019). How are banks becoming digital sales engines? Marketing Technology and Intelligent Sales. <https://www.finextra.com/>. Retrieved 3 May 2021, from <https://www.finextra.com/blogposting/17313/how-are-banks-becoming-digital-sales-engines-marketing-technology-and-intelligent-sales>.
100. Sarker, I., Alqahtani, H., Alsolami, F., Irshad Khan, A., Abushark, Y., & Khubeb Siddiqui, M. (2020). Context pre-modeling: an empirical analysis for classification based user-centric context-aware predictive modeling. <https://journalofbigdata.springeropen.com/>.

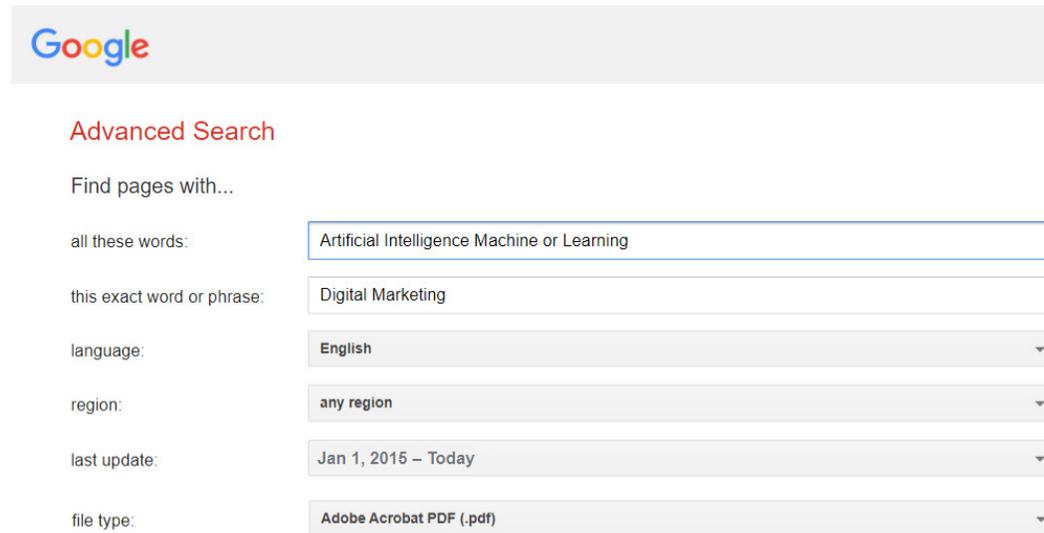
Retrieved 3 May 2021, from <https://journalofbig-data.springeropen.com/track/pdf/10.1186/s40537-020-00328-3.pdf>.

101. Zhou, X., Jin, Y., Zhang, H., Li, S., & Huang, X. (2016). A Map of Threats to Validity of Systematic Literature Reviews in Software Engineering. <https://ieeexplore.ieee.org/>. Retrieved 1 May 2021, from <https://ieeexplore.ieee.org/document/7890583>.

Appendix

I. Search strings formulation

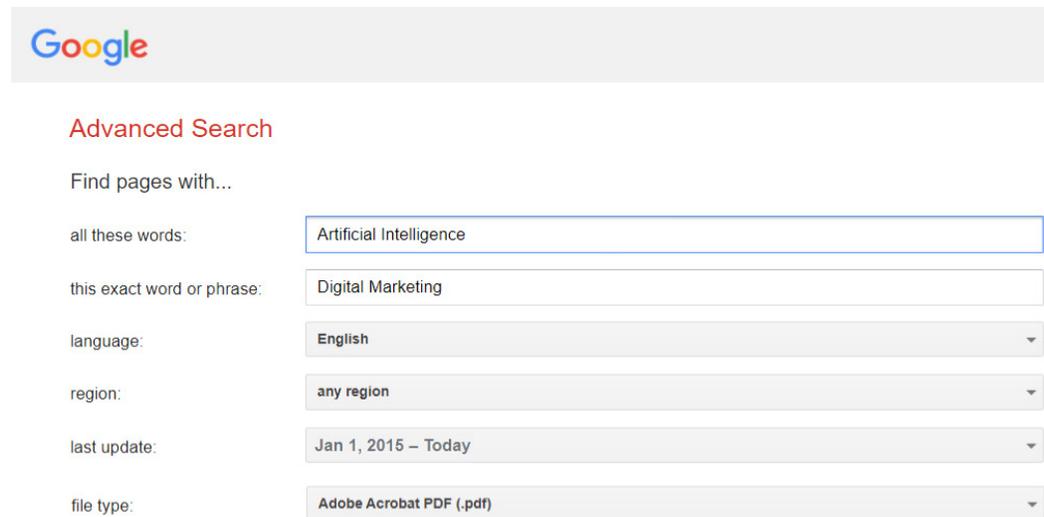
STR1: Artificial Intelligence Machine OR Learning "Digital Marketing"



The screenshot shows the Google Advanced Search interface. At the top is the Google logo. Below it is the heading "Advanced Search" in red. The main section is titled "Find pages with...". There are six rows of search criteria, each with a label on the left and a corresponding input field or dropdown menu on the right:

- all these words:
- this exact word or phrase:
- language:
- region:
- last update:
- file type:

STR2: Artificial Intelligence "Digital Marketing"



The screenshot shows the Google Advanced Search interface. At the top is the Google logo. Below it is the heading "Advanced Search" in red. The main section is titled "Find pages with...". There are six rows of search criteria, each with a label on the left and a corresponding input field or dropdown menu on the right:

- all these words:
- this exact word or phrase:
- language:
- region:
- last update:
- file type:

STR3: Machine Learning "Digital Marketing"



Advanced Search

Find pages with...

all these words:

this exact word or phrase:

language:

region:

last update:

file type:

STR4: AI "Digital Marketing"



Advanced Search

Find pages with...

all these words:

this exact word or phrase:

language:

region:

last update:

file type:

STR5: ML "Digital Marketing"



Advanced Search

Find pages with...

all these words:

this exact word or phrase:

language:

region:

last update:

file type:

STR6: Artificial Intelligence "Online Marketing"



Advanced Search

Find pages with...

all these words:

this exact word or phrase:

language:

region:

last update:

file type:

STR7: Machine Learning "Online Marketing"



Advanced Search

Find pages with...

all these words:

this exact word or phrase:

language:

region:

last update:

file type:

II. License

Non-exclusive licence to reproduce thesis and make thesis public

I, Danijel Golubovic,

(author's name)

1. herewith grant the University of Tartu a free permit (non-exclusive licence) to reproduce, for the purpose of preservation, including for adding to the DSpace digital archives until the expiry of the term of copyright, **How AI is used in Digital Marketing**,

(title of thesis)

supervised by Fredrik Payman Milani, PhD.

(supervisor's name)

2. I grant the University of Tartu a permit to make the work specified in p. 1 available to the public via the web environment of the University of Tartu, including via the DSpace digital archives, under the Creative Commons licence CC BY NC ND 3.0, which allows, by giving appropriate credit to the author, to reproduce, distribute the work and communicate it to the public, and prohibits the creation of derivative works and any commercial use of the work until the expiry of the term of copyright.

3. I am aware of the fact that the author retains the rights specified in p. 1 and 2.

4. I certify that granting the non-exclusive licence does not infringe other persons' intellectual property rights or rights arising from the personal data protection legislation.

Danijel Golubovic

05/05/2021