

The impact of implementing artificial intelligence in digital marketing Lynda HOCINE¹

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Abstract: Artificial intelligence is revolutionizing marketing activities, helping marketers increase the performance of their strategies and the satisfaction of their customers, by helping them take more effective decisions. The digital giants (Google, Facebook, Apple, and Amazon) were the first to invest heavily in AI in order to innovate and create new products and services using big data systems. Today, these massive ones are shaking the global economy and are worth hundreds of billions of dollars, and that makes them role models for other companies all over the world. The first purpose of this paper is to present the various artificial intelligences that could be used in marketing. The second is to demonstrate how these intelligences are implemented and especially their impact, and the last is to provide an overview of the current situation of artificial intelligence in Algeria.

Keywords: Artificial intelligence, Digital marketing, Big data, Machine learning, Marketing decisions

Résumé: intelligence artificielle révolutionne les activités du marketing, en aidant les marqueteurs à améliorer la performance de leurs stratégies ainsi que la satisfaction client, cela en les aidant à prendre des décisions efficaces. Les géants digitaux (Google, Facebook, Apple et Amazone), étaient les premiers à investir lourdement dans l'intelligence artificielle dans le but d'innover et créer de nouveaux produits et services en utilisant les systèmes big data. Aujourd'hui, ces géants sont en train de bouleverser l'économie mondiale et qui valent des centaines de milliards de dollars. Chose qui fait de ces géants un modèle à suivre pour toutes les entreprises dans le monde entier. Le premier but de ce papier, est de présenter les différentes intelligences artificielles qui pourraient être utilisées en marketing. Le deuxième but est de démontrer comment ces intelligences artificielles sont déployées et spécialement leur impact, et le dernier est de donner un aperçu sur la situation actuelle de l'intelligence artificielle en Algérie.

Mots clés : L'intelligence artificielle, Marketing digital, Big data, Machine learning, Décisions marketing.

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1. Introduction:

Marketing is a science that never stops evolving and that includes employing any tool that can help better understanding customer behavior and preferences to result in increasing satisfaction. In the same matter and for the same goals marketers nowadays are utilizing new technologies and taking advantage of internet that provides them with big amounts of data that can help them take more efficient decisions.

Using new technologies in marketing is referred to as digital marketing; it's known that the economic environment is not stable, competition on the market doesn't stop intensifying, and customers' behavior and needs are constantly changing due to the different changes happening in the markets (trends), and development of new technologies that are effecting almost all the fields.

Artificial Intelligence is a branch of science and technology that creates intelligent machines and computer programs to perform various tasks which requires human intelligence (ASHLYN, 2021). Companies should not look at artificial intelligence only as technologies; instead it's useful to acknowledge that AI can support three important business needs: automating business processes, gaining insights through data analysis, and engaging with customers and employees (Davenportand & Ronanki, 2018).AI enables organizations to make better decisions, improving core business processes by speeding up and improving the accuracy of strategic decision-making processes.

Marketing managers understood the big potential of AI, and that it's a very useful tool that can help achieve both business and marketing goals, that's why Starbucks Uses Predictive Analytics to Serve Personalized Recommendation, Alibaba Opens a FashionAI Store and Amazon was a pioneer in using machine learning to offer personalized product recommendations (Phil, 2021).

In this paper we'll try to analyze the importance and the use of AI in marketing in general, but also we're going to investigate the work that has been done regarding AI in Algeria, including its implementation in business and the academic researches as well.

2. Introduction to artificial intelligence:

In this section we're going to give some definitions to the most important elements of AI from a technical perspective.

2.1 What is artificial intelligence

the ability of a digital computer or computer-controlled robot to perform tasks traditionally associated with intelligent beings The term is frequently applied to the project of developing systems with human-like cognitive processes, such as the ability to reason, discover meaning, generalize, or learn from past experience (Copeland, 2022).

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Knowledge representation, search, perception, and inference are all aspects of artificial intelligence (AI). Artificial intelligence (AI) must define and read data in order to generate results that can be represented and processed. The path to success that is a search and an inference when it comes to search, sophisticated search algorithms are required to find the best solutions. Then, for each situation, inferences are drawn.

The path that artificial intelligence (AI) takes to make decisions begins with data selection process, data pre-processing continues, data transformation, data Mining is critical to the entire process, and finally, results evaluation will lead to making a decision (Copeland, 2022).

2.2 Big data

The term "big data" refers to an increase in the quantity and variety of high-frequency digital data. Large amounts of data enter a company from all directions: social media posts and comments, digital images and videos, and so on. GPS signals, electronic catalogues, cash and consumer transaction reports from mobile phones, and so on these data are extremely large and complex Traditional data processing software is incapable of processing.

The main difficulties the collection, storage, analysis, searches, and sharing of large amounts of data is all associated with them. Their privacy, transfer, visualization, and updating with the exponential growth current technologies become obsolete as data volumes increase. Massive amounts of data processing necessitate complex coding abilities, domain knowledge, and statistical knowledge.

The term "big data" refers to a new generation of technologies and architecture designed to economically extract value from large amounts of diverse data through high-speed and deep analysis. These data sets are so massive that current or traditional technologies are incapable of dealing with them (collection, storage, management, and dissemination). analyze it more quickly and efficiently (Dimitriska, Stankovska, & Efremova, 2018).

2.3 Machine learning

Machine learning is the study of how to automatically generate robust predictions from complex data. It is closely related to modern statistics, and many of the best ideas in ML have come from statisticians (Taddy, 2019).

There are three types of machine learning algorithms: supervised learning, unsupervised learning, and reinforcement learning (Sterne, 2017). Supervised learning is used when a specific set of data is missing and should be adequately predicted. When the connection between unrelated, diverse data must be discovered in a large set of data, unsupervised learning is used. Reinforcement learning falls somewhere in the middle, predicting what will happen if two or more events or data points are linked.

Machine learning is a branch of artificial intelligence that enables programs to process large amounts of data and generate predictable algorithms that improve over time. It's used to predict or provide calculated suggestions that are based on analyzing large amounts of data (Tjepkema, 2017).

Marketers can use machine learning to provide personalized content to customers as well as product recommendations. Marketers have data that ensures success in providing consumers with what they want to buy.

2.4 Deep learning

Deep learning is a subfield of machine learning that uses hierarchical architectures to learn high-level abstractions from data. It's also defined as a type of machine learning approach that is described as the mechanism of giving machines massive amounts of data in order for them to operate on a self-learn-solve paradigm (Kutton, 2018).

Deep learning technology is becoming increasingly capable of analyzing large databases for patterns and insights. It's not difficult to imagine a day when businesses will be able to integrate a diverse set of databases to better understand what customers want through greater sophistication and analytic power, and then use that knowledge to gain a competitive advantage. For example, it may not be long before consumers who are identified using facial recognition technology while grocery shopping receives personalized coupons based on previous purchase behavior.

Deep learning outperforms traditional statistical modeling in predicting customer attitude changes, shopping and purchasing behavior, and can lead to increased profit opportunities (Urban, Glen, & al, 2019).

3. Artificial intelligence in marketing

In this section we're going to dive deep into digital marketing and its relation with artificial intelligence.

3.1 Digital marketing

3.1.1 from traditional to digital marketing

Marketing is a restless, changing, and dynamic business activity (Madhu & Deepak, 2018), and with the impressive development of the new technologies of information and communication especially internet, that were and still are being utilized in marketing we've witnessed the birth of what we call today digital marketing.

The term Digital Marketing was first used in the 1990s. The digital age took off with the coming of the internet and the development of the Web 1.0 platform. And as a definition, digital marketing is the use of technologies to help marketing activities in order to improve customer knowledge by matching their needs (Chuffey, 2013).

3.1.2 Digital marketing channels:

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Digital marketers use multiple free and paid digital channels to achieve marketing goals, increase brand awareness and eventually sales. Social media, the company's own website, search engine rankings, email, display advertising, and the internet are all examples of these channels of the company.

Another important tool that helps to company evaluate the effectiveness of its strategy are KPIs, or key performance indicators that are mainly used to measure the company's performance. The digital marketer and so he can properly measure the company or the marketing strategy performance, uses different key performance indicators (KPIs) for each channel (Vaibhava, 2019).

a) Search engine optimization(SEO):

It's an unpaid method used by marketers also called organic results, it's the procedure of optimizing a website (the code) so that it "ranks" higher in the search engine results pages, increasing the amount of organic (or free) traffic to websites.

b) Search engine marketing (SEM):

It's a paid method that's used to increase the visibility of a website on the search engine results pages. It's also referred to as pay per click (PPC) it's a method to drive traffic to a website using ads on search engines like Google and Bing by paying them every time someone clicked on the ad. It also gives websites the ability to display their ads on one of the top 03 places of search engine results pages.

c) E-mail marketing

In order to create stronger relationships, companies use emails to communicate with their current and potential customers. Emailing campaigns are utilized to send newsletters, discount coupons, promote products/services, events, or content, they're also used to direct traffic toward the company's website.

Blog subscription newsletters, follow-up emails to website visitors who downloaded something, customer welcome emails, holiday promotions to loyalty program members, Tips or similar series emails for customer nurturing are examples of emails you might send in an email marketing campaign.

d) Social media marketing

With the appearance of social media platforms like Facebook, Instagram, Twitter, LinkedIn and others that turned the world into a small village, and made it easier for people to communicate and share their personal thoughts and reviews.

Marketers understood the big potential of social media and are using it to increase brand awareness, promote products and services, get the customers' feedback, and drive traffic.

e) Mobile marketing

Any advertising activity that promotes products and services through mobile devices such as tablets and smartphones is referred to as mobile marketing. It uses modern mobile technology features, such as location services, to tailor marketing campaigns based on an individual's location.

Mobile marketing is a method of using technology to create personalized promotions of goods or services to a user who is always connected to a network (Kenton, 2022).

3.2 Artificial intelligence in marketing

In this section we're going to present the work that has been done in marketing using artificial intelligence technologies.

3.2.1 AI for a better performance

From a strategic standpoint, AI is becoming increasingly crucial in marketing. Google, Rare Carat, Spotify, and Under Armor are among the growing number of businesses that are improving their performance by implementing AI-based systems (such as Microsoft Cognitive Services, Amazon Lex, Google Assistant, or IBM Watson). This strategy boosts consumer connection across marketing channels while also improving market forecasts and automation. As a result, AI has been named the most impactful business technology, with a projected increase from \$10.1 billion in 2018 to \$126 billion by 2025 (tractica, 2020).

Powerful solutions

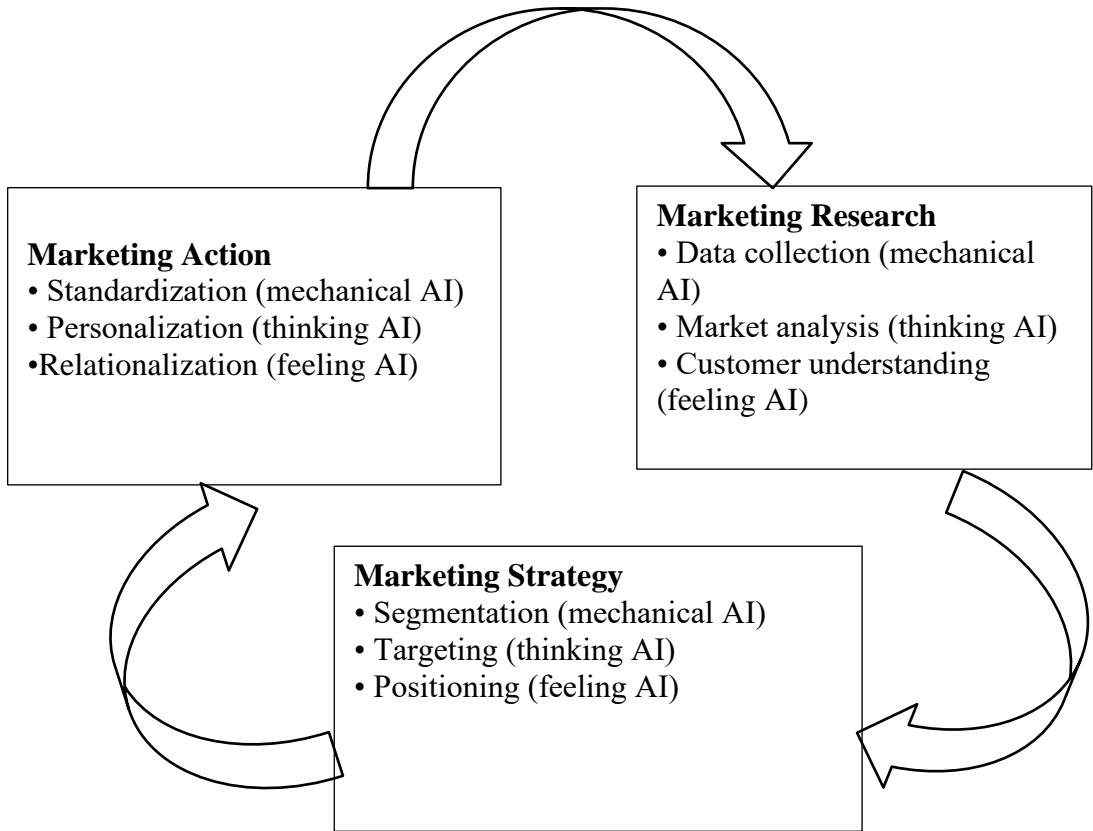
The two fundamental duties of decision making are tree introduction and tree pruning (Davis, 2016). The introduction and building of a "tree" of data is a procedure that occurs when a large amount of data is segregated by attributes, then selected, separated, and classified. The objective is for the data tree to be composed of the most minimum data that is distributed over the complete collection of data.

The purity is tested using the idea of information, which demonstrates how much one needs to know about a specific issue. The entire data tree might be too complex and contain unneeded elements, making it difficult to grasp and analyze. The act of eliminating unneeded components from the decision tree so that individuals may make more efficient, accurate, and comprehensible judgments is known as tree pruning.

The marketing research–strategy–action cycle

AI may play key roles in all three stages of strategic marketing. It demonstrates that a marketer may use a variety of AI intelligences, including mechanical, thinking, and feeling intelligence. These roles were illustrated in *figure 01* (Huang & Rust, 2020).

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Source: (Huang & Rust, 2020)

AI is defined as the use of computational machinery to emulate human capabilities such as performing physical or mechanical tasks, thinking, and feeling; the multiple AI intelligence view holds that, rather than treating AI as a thinking machine, AI can be designed to have multiple intelligences, as humans do, for different tasks. There are mechanical, thinking, and feeling AI intelligences, which are ranked by the difficulty with which AI can address them (Huang, Rust, & al, 2018;2019).

Each AI intelligence can provide a distinct benefit:

Because of its consistency, mechanical AI can help with standardization. Various types of mechanical AI have been used in marketing to provide a standardization benefit; for example, collaborative robots (cobots) assist with packaging (Colgate, Wannasuphprasit, & PeshkimM., 1996) wi(Colgate et al. 1996), drones distribute physical goods, self-service robots deliver service, and service robots automate social presence in frontline (Mende, Skott, van Doom, Grewal, & Shanks, 2019).

Because of its capacity to identify patterns in data (e.g., text mining, audio recognition, and facial recognition), thinking AI can help in personalisation. Any marketing department or activity that might benefit from tailored outcomes should think about AI.

Because of its capacity to perceive and respond to emotions, feeling AI delivers relationalization benefits (i.e., personalizes interactions). Feeling AI should be considered for any marketing duties or activities that need engagement and communication with the purpose of relationship advantages. (Huang & T.Rust, 2020)

Key elements of AI in marketing:

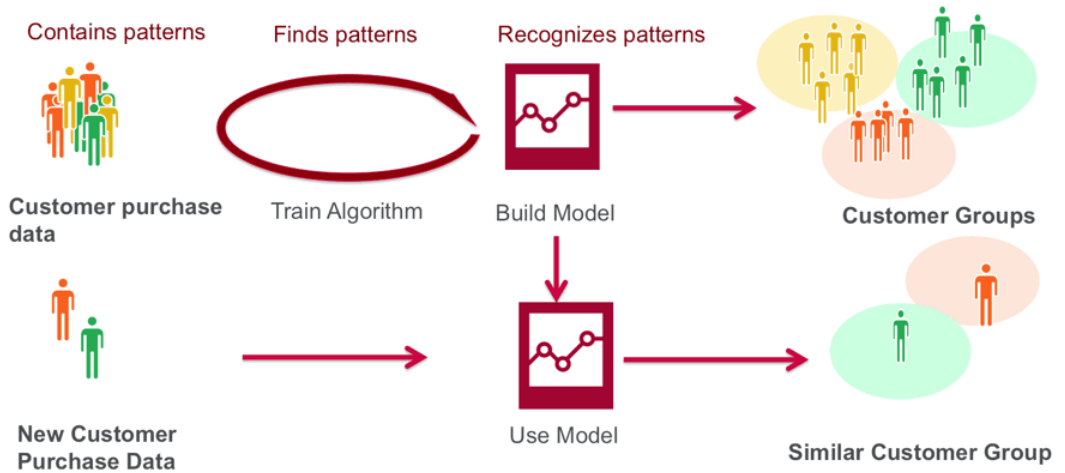
Big Data: could represent the fundamental principle of gathering a massive quantity of data about customers' purchasing habits as well as new customers' buying preferences. It is also known as a marketer's ability to aggregate and separate large data sets with minimum manual labor. Marketing teams may utilize such updated data to ensure that the correct message is given to the right person at the right time via a channel of choice.

Machine Learning: refers to the creation and application of models based on identified patterns. When marketers attempt to obtain meaningful information from massive data warehouses, a machine learning platform enters the scene. This may aid in discovering and comprehending patterns or typical occurrences, as well as successfully anticipating insights and reactions, assisting marketers in comprehending the key element and likelihood of specific activities reoccurring.

Powerful Solutions: The ultimate outcome of artificial intelligence marketing actually conceptualizes the world in the same way that a person would. AI technologies can detect key concepts and trends across massive data sets in record time. In addition to technical issues, AI solutions perceive communication, sentiments, and desires in the same way that humans do, making this platform broadly accepted.

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Figure02 outlines the execution path of fundamental aspects from data collection to strong solutions AI Marketing consists of a few important components that contribute to its current power. These components work in sequence, as detailed below:



Source : <http://explore.mapr.com/ml-ai-advantage/demystifying-ai-ml>

3.2.2 Benefits of AI in marketing

- **Profound Hunting:** With the rapid advancement of technology, clients may now locate whatever they are seeking for at any moment using quick-fire search engines (Google, Yahoo etc.). Artificial intelligence assists marketers in studying customer search trends and pinpointing the important areas on which they should focus their efforts.
- **Genius Advertisements:** marketers may design smarter and more successful web marketing with the availability of abundant data. AI solutions may analyze a customer's keyword searches and social profiles to create customized adverts.
- **Filtered Content:** audience analytics may assist marketers in better understanding their clients on an individual basis. AI may be used to screen potential purchasers and develop tailored content that is perfect and relevant to the target client groups.
- **AI Bots:** customer retention is just as crucial as acquiring new consumers. AI is a big motivator for client retention. AI Bots are utilized to power chat services and direct-to-consumer interactions. This marketer may save money and time by using this service.

- **Progressive Learning:** AI can not only get access to previously hidden information, but it can also be trained to incorporate previously concealed insights into current initiatives. With the passage of time, these AI systems will grow smarter and more successful at removing garbage data and fostering real-time decision-making (Piyush & Keshav, 2020).

4. Artificial intelligence and digital marketing in Algeria

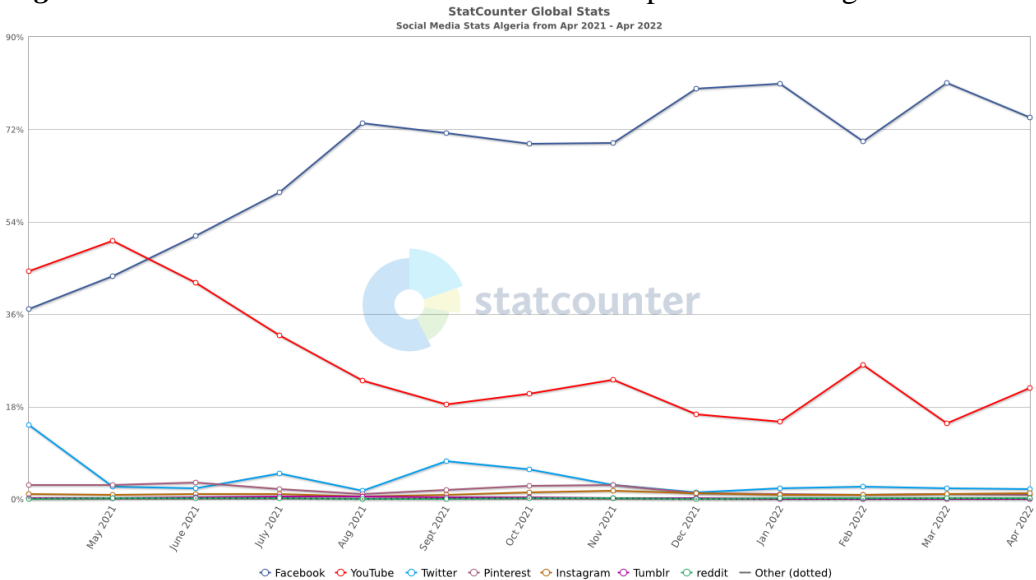
In this section, we’re going to cover the latest statistics and the work that have been done in digital marketing and artificial intelligence in Algeria.

4.1 Digital statistics in Algeria

In January 2022 the number of internet users in Algeria reached 27.28million users, and at the start of 2022, the internet penetration rate was 60.6 percent of the overall population.

It was also reported that social media users in Algeria increased by 1.6 million (+6.4 percent) between 2021 and 2022, so there were 26.60 million social media users in Algeria in January 2022, which was equivalent to 59.1 of the total population (dataportal , 2022).

Figure03: illustrates the statistics of social media platforms in Algeria



Source : <https://gs.statcounter.com/>

As we can see and according to statcounter: Facebook is the most used social media platform in Algeria (74.36%) and in the second spot comes YouTube (21.67%), and then comes Twitter (1.89%) and Instagram (1.07%)

Facebook and Instagram users numbers in Algeria

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According to data revealed in Meta's advertising resources, Facebook has 22.45 million users and Instagram 8.60 million users in Algeria in early 2022.

In addition, in January 2022, Facebook's ad reach in Algeria was comparable to 82.3 percent, and Instagram's ad reach in Algeria at the start of 2022 was equivalent to 31.5 percent of the local internet user population (regardless of age).

3.2 Artificial intelligence in Algeria

Supporting AI in Algeria:

Algeria has established its first national policy for artificial intelligence (AI) research and innovation, with the goal of creating an innovative society and a generation of digitally proficient individuals.

According to Abdelbaki Benziane, the minister of higher education and scientific research, the policy intends to "increase Algerian talents in AI through education, training, and research, and to build these capacities as a tool for growth." (universityworldnews, 2021)

Education and AI in Algeria

The establishment of the Higher School of Mathematics and the Higher National School of Artificial Intelligence, which opened their doors to new students in October for the academic year 2022/2021, provides an elite education that meets international standards in these two specialties known for their importance in the country's technological and economic development (ENTV, 2021).

According to Ahmed GUESSOUM director of Bab Ezzouar University's Artificial Intelligence Laboratory, in his presentation last December in which he highlighted the road of artificial intelligence in Algeria and its future, drawing various analogies with other nations. In this context, he mentioned that in Algeria there are 116 research laboratories linked to artificial intelligence. These laboratories include 568 research teams, affiliated with 6169 researchers. These researchers are scattered throughout 40 universities across the country (echoroukonline , 2020).

AI and business in Algeria

According to Younes Gar, AI and its benefits have become unavoidable, particularly in the context of the pandemic and its limits. It's necessary for businesses to have real-time data from the field. For this, it is necessary to go towards adapted solutions (software, applications and big data to collect, process, analyze data).

As a result, Algeria must place increasing emphasis on AI-related activities. It is an opportunity to prepare for the post-oil era. Building projects that use big data technology can help our decision-makers better manage the economy during times of crisis, especially because they allow businesses to increase productivity.

If the necessary resources and talents are available, change can be initiated. AI is at the forefront of digital technology. We do, however, require a strategy, a vision, and genuine political will (Gar, 2021).

5. Conclusion

Artificial intelligence is a powerful branch of computer science that can be applied in every science and be beneficial. In this work we tried to highlight the impact of artificial intelligence on marketing, and how it has changed the way companies do business by making it more responsive, more productive and more competitive.

Artificial intelligence is providing powerful solutions and answering many of the digital marketing questions. The different technologies of artificial intelligences like thinking AI, machine learning and the powerful solutions can be applied in different phases of the elaboration of a marketing strategy (data collection, market analysis or personalization).

And other AI technologies like bots can be used to maintain permanent connection with customer (answering all of their questions in real time 24/7) which results in customer retention.

When it comes to digital marketing in Algeria, and according to the data we previously presented, we can see that there is a big potential in the Algerian market for businesses to take advantage of for promoting and selling their products and to increase brand awareness as well. But when it comes to artificial intelligence, the Algerian government has taken it seriously and is investing in AI by creating the Higher School of Mathematics and the Higher National School of Artificial Intelligence in 2021, and establishing its first national policy for artificial intelligence (AI) research and innovation.

Algeria is taking serious steps in order to create an innovative society and a generation of digitally proficient individuals.

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