

# Chapter 7

## Evaluating the Performance of Deep Learning Methods and Its Impact on Digital Marketing



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**Abstract** This article maps and explains how two distinct areas of the marketing sciences are now and potentially related to computer science. It analyses the interplay of DL in the academy, and at the same time proposes a machine research framework that might be appreciated in many respects of the scientific field of digital marketing. In the fields of deep learning there are many research papers (DL). This quantity remains modest, however, with regard to digital marketing elements. Marketing intelligence may benefit in many ways from scientific studies on deep learning (DL). Today only a tiny proportion is linked to particular digital marketing techniques by scientific study on Digital Marketing and Deep Learning (DL). Generic aspects such as e-business, consumer behavior, e-commerce strategies, social media advertising, search engines and consumer prevision modelling are mostly discussed, and are not more closely dependent on specific marketing problems that are more aware of in business, such as social media consumption, target commercials, social media marketing, and transformation optimization. In spite of the extensive field of study and a lot of publications, it seems that scholarly papers on digital marketing and deep learning particularly lack (DL). Nevertheless, some highly comprehensive research

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efforts are quite promising in certain areas of digital marketing and deep learning. This article is by mapping applications in the field of digital marketing in the present state of deep learning (DL). It emphasizes the foundational element writings, identifies regions of absence or lack of their existence, and offers a learning engine that may fit into numeric marketing opportunities.

## 7.1 Introduction

The advancement of technology has provided businesses with the ability to provide consumers with massive quantities of goods in the modern day. Consumers may now purchase goods and services via digital marketing platforms such as the Internet, which allows businesses to promote and sell their products to a wider audience [1]. Digital marketing encompasses all of the techniques that may have a significant effect on individuals at a specific moment, in a specific location, and via a specific channel [2]. The combination of data analytics and academic scientific study on intelligent systems has resulted in significant development in the field of digital marketing. This article examines and explains digital marketing techniques from the viewpoint of deep learning (DL) research, which is presented in depth. Meanwhile, the number of research writings continues to be at an intermediate level, despite the fact that the commercial sector seems to be making strides ahead. Using deep learning (DL) approaches to improve the effectiveness of digital marketing strategies, this article focuses on the technical components of digital marketing strategies in scientific research to help researchers better understand them. Despite the wide study area and a significant number of publications, it seems that there is a paucity of scientific papers, particularly in the areas of digital marketing and deep learning, given the increasing number of journals in the field (DL) [3]. In spite of this, there have been some very extensive research attempts on specific digital marketing fields such as search engine optimization, search engines ranking factors, consumer behavior, web development, and targeted advertisements, which provide encouragement for the future of deep learning (DL) impact on digital marketing data analysis [4].

## 7.2 Digital Marketing

Digital marketing encompasses any marketing strategies and methods that make use of an electrical gadget or the web to demonstrate, promote, or sell goods or services, as well as industries that make use of online channels that will assist them in their efforts to succeed. Websites, social media pages, targeted advertising, and email are all effective ways to keep consumers up to date and attract more new ones. Consumers, resellers, competitors, suppliers, promoters, the economy overall, placement, segmentation, enlargement, development, goods, branded products, marketing, market share, price, promotional efforts, number of resellers, churn, customer value,

and other factors are some of the most significant factors that influence decision making in business. Certainly, judgment is a complex process that involves a variety of factors based on the findings, experiences and intuition. In order to identify the critical function of deep learning (DL) in digital marketing research, we must first map the present state of digital marketing scientific research and relate it to the business community. Deep learning (DL) is a kind of machine learning that can learn from data. Then we will be able to determine to what extent digital marketing in academics is falling behind the advancements in the commercial sector [5].

### **7.3 Deep Learning Methods and Its Effect on Digital Marketing Include**

We examine briefly the most significant commercial digital marketing techniques. Optimization Search engine (SEO), social media marketing (SMM), content marketing, pay per click (PPC), affiliates marketing, native ads, online advertising, chatbots (semantic search), ad targeting, and protectionary marketing. This is how it is having an effect on digital work in general [6]. Table 7.1 shows that different methods for deep learning.

### **7.4 Deep Learning an Understanding**

Deep Learning is a technique that simulates human brain by using “neural networks” to learn by completing a task repeatedly and somewhat differently each time in order to improve the result. Figure 7.1 shows that Deep learning Methods as a result, the computer “thinks” in the same manner that a person does, based on past experiences and knowledge [7]. However, the distinction is that the computers is capable of processing vast quantities of data and doing activities at much quicker rates than a person would be able to, which allows them to solve difficult issues and acquire new abilities in a considerably shorter period of time. Handwriting identification as an illustration of how it works. Traditional computer algorithms need the computer to be taught a set of rules in order for it to identify each individual character in a document [8]. Even though this seems like an impossible job when you consider the number of differences in handwriting, we humans are able to interpret many various types of handwriting without any difficulty so because neural network in our brains is performing the work for us. An artificial intelligence system may be trained to identify personal notes in the same manner that a human brain does so by exposing the computer to a large number of sample characters and understanding how to recognize each character from these instances. Figure 7.2 shows that deep learning steps. The greater the number of samples you provide the computer, the more effective it will get at handwriting identification. In order to perform this kind

**Table 7.1** Classification of deep learning methods

SEO (Search engine optimization)	It concerns processes to optimize website traffic, blogs or info graphics which rank well in the results of search engines
Marketing through social media	It relates to methods which optimize and support social media brands to boost organic traffic, enhance brand recognition and create business leads
Marketing through content	This means creating a blog post, e-book, infographic and online brochures for brand recognition, increasing the volume of visitors, generating leads, and consumers. This includes strategic and human-centered content
(PPC) Pay-per-click	It is a way of bringing the visitors into a website when a link is clicked or an activity takes place, by paying for a publication Internet service
Marketing through affiliates	This is a recommendation technique to promote a company through a person or a community of enthusiasts who get a commission either in the form of video or a link on their website
Advertising on native lands	It pertains to publicities which are shown on a digital platform and which follow the natural nature of customer experience accompanying unpaid material
Automated marketing	It includes software that automated fundamental business requirements on a daily basis, such as e-mail, social media, etc.
Marketing through email	It concerns ways to create e-mail promotions in order for the clients to stay in touch, tell them about reductions, new things and happenings
Chatbots	See programmable and autonomous interactive conversation and order completion apps with website users and social media visitors when the latest visit is made
Search using semantics	It pertains to an intelligent data search technique that enables consumers to quicker discover the result they are looking for. Based on machine learning, the question is interpreted and the significance of the search term is understood through data correlations between words. It anticipates what data the search history of users might require
Creation of content	It pertains to the content production approach that uses a deeper learning (DL) methodology dubbed natural language generation, which collects, organized, converts the raw information relevant for the search into understandable sports, financial statements etc.

(continued)

**Table 7.1** (continued)

Advertisement targeting	It relates to advanced methods for generating Internet advertising that are important to branding. It produces or optimists ads based on user history and behavioral variables importing such as geographical location, sex, age etc. to better target the user in order to increase sponsors' return on investments
Marketing that is predictive	It concerns a deep learning (DL) method which collects and analyzes users' behavioral data, and finds potential connections of data, including preferences and requirements, via data mining. With this data, the neural network model is supplied and improved predictions are produced which assist policy makers in the business
Search by voice	It applies to the methods of deep learning (DL) in voice searches. Voice search will restore the impression of result speed and relevance and will framework presents recovery an extraordinarily simple operation based on speech recognition and text mining methods
Trial of A/B	The test refers to an Internet marketing strategy which would generate greater conversions or leads in version of the same website. Driven by deep learning (DL), conversions improvements are carried out into variants of many editions of the very same website, as well as the most likely user involvement is determined
Score of lead	It involves a process of evaluating and classifying client leads based on user behavior, interest rate and buying history in order to prevent loss of money and time

of job, neural networks must be built by a software engineer and must include many distinct layers of neurons, or decision-making units, which is why the term deep in deep learning refers to numerous different layers of neurons [9].

## 7.5 Deep Learning for Personalization

When it comes to marketing, one of the most intriguing uses of deep learning is the ability to provide hyper personalization [10]. Personally tailored marketing campaigns are already becoming popular, and they are proving to be popular with customers as well—transaction rates for customized emails are six times greater than those for generic emails. Privacy issues, as well as a shortage of funds to gather adequate data, may be tripping obstacles on the path to achieving effective customization [11, 12].

Because of the development of the Internet of Things, we are already beginning to gather enormous quantities of data about people from their computers, wearable gadgets, mobile phones, smart TVs, and even household appliances, heating and lighting systems, and other electronic equipment [13, 14]. In order to effectively

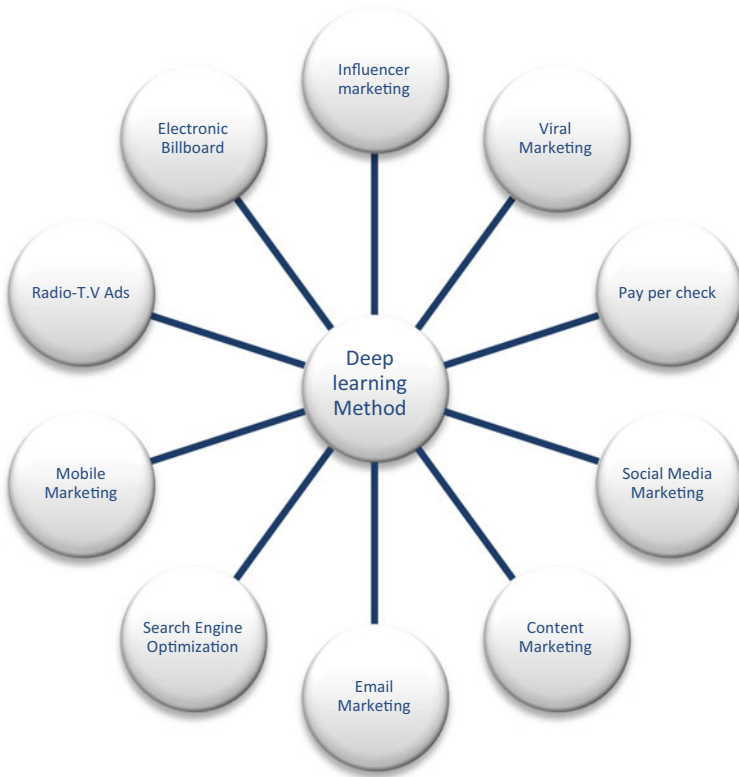


Fig. 7.1 Deep learning methods

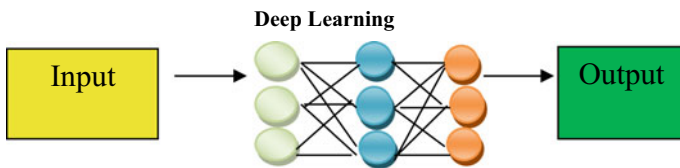


Fig. 7.2 Deep learning steps

interact with consumers on a highly customized level, marketers will be exposed to an increasing amount of data, which will need the development of advanced analytical skills [15].

Consumers are immediately scanned and recognized as they pass by in the movie *Minority Report*, and they are greeted by name, asked about their previous purchases, and shown a constantly changing array of personalized advertisements customized to their individual needs and preferences, according to the film [16]. Even casually perusing Facebook has an unnerving similarity to the scenario from the film in many

**Table 7.2** The following are some instances of deep learning in action

1	Real-time bidding (RTB) software is used to purchase advertising space
2	Artificial intelligence (AI) chatbots that converse with consumers in a “human” manner are being developed
3	Using automatic translation, you may generate several language versions of your webpage in a matter of minutes
4	Copy that has been produced autonomously depending on the style of another line of writing
5	Automatically generated picture captions
6	Using speech recognition to do a voice search

respects. The future of individualized marketing is already here, and it’s called Facebook [17]. Customers’ personalized experiences would become the most essential consideration of your marketing strategy as your company’s access to personal data grows. Care must be taken to strike a balance between offering exactly what the customer wants before they ask for it and crossing a line of that private information.

## 7.6 Deep Learning Will Play an Increasingly Important Role in Your Digital Marketing Approach in the Future

When it comes to getting begun with the deep learning process for your digital marketing strategy, online businesses may choose from a variety of different starting points. Deliberate learning methods, for example, may aid in the solution of a number of difficult issues, such as analyzing huge quantities of data and developing customized information flows for consumers.

While developing meaningful, customized connections with participating users, DL technologies and chatbots allow future-oriented market research that is far quicker than a human could possibly accomplish [18].

Table 7.2 shows that the following are some instances of deep learning in action: For the contemporary marketing department, data mining methods allow for the generation of foresighted information. Your team may use this data analytics capabilities (predictive analytics) to interact with targeted prospects at numerous points of contact throughout the sales funnel, allowing them to maximize their revenue.

## 7.7 Conclusion

Based on our findings, the quantity of scientific research that has been conducted and that refers to the use of deep learning (DL) in digital marketing methods is still in its early stages, with a few notable exceptions. Customization, targeting, high conversion rates, high returns on investment, and other features are just a few of the things we

may expect to see as a result of the rapid technical advancements in marketing and computer science. Marketers, businesses, and judgment have an amazing opportunity right now to seize the moment and achieve outstanding outcomes. Deep learning (DL) will unquestionably set new norms in digital marketing, both in academics and in the corporate community. The industrial sector is just a few steps ahead of the point at where the academic world is now situated. Despite the development of the deep learning (DL) model used by businesses, academics will ultimately be able to bridge the gap between the two. Marketing science is always evolving, not only in the business sector, but also at institutions, where new knowledge is created, and companies rely on this latter source of information.

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