

## Improving E-marketing using Big Data Technology

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# Improving E-marketing using Big Data Technology

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## ملخص:

في عصر البيانات الضخمة، أصبح تحليل هاته البيانات واستغلالها من قبل المؤسسات ضرورة حتمية لتظل هذه الاخيرة قادرة على المنافسة في مجال التسويق . على ضوء ذلك، تهدف هذه الدراسة الى إلقاء نظرة على مفهوم التسويق الإلكتروني باستخدام البيانات الضخمة. تتعرض هذه الدراسة أولا الى المساعدة على فهم مجال التسويق الإلكتروني بمختلف تقنياته، ثم تتعرض الى مجال البيانات الضخمة واستغلالها في التسويق الإلكتروني من خلال إظهار التقنيات المطلوبة لذلك والفوائد الناجمة عن هذا الاستخدام. كما تستعرض الدراسة مختلف التحديات والصعوبات الواجب معالجتها قبل الولوج الى هذا المجال.

**الكلمات المفتاحية:** التسويق الإلكتروني، البيانات الضخمة، تحليل البيانات

## Abstract

In the era of Big Data, the analysis and exploitation of data by companies are already becoming essential to remain competitive in marketing. The purpose of this study is to look at the concept of E-marketing based on the use of big data. The paper attempts to help in the understanding of the concept of electronic marketing. Moreover, the study evokes the field of big data with its exploitation in marketing by showing the required techniques, the contributions and the different challenges arising from this use.

**Keywords:** E-marketing, Big data, Data analytics.

## **Introduction**

In recent years, and with the rapid growth of information and communication technologies, the world knows a huge amount of data called “Big data” that must be taken into consideration by enterprises in order to cope with the business challenges.

Due to this evolution, applications based “Big data” have taken an important place in the new economy. Any information related to the company's activity field is considered important whether related to the partners, customers or to the socio-economic environment.

Since e-marketing-related activities generate a deluge of data produced by the digital world (e-commerce, Internet requests, social networks, smartphones and more connected objects), it is also useful to manage and exploit this important mass through the use of Big Data techniques. But the main problem for marketers is not the lack of information; on the contrary, companies do not miss data to improve their marketing strategies but rather how to exploit this information with intelligent way knowing that this latter have heterogenous structures and comes from different sources that do not communicate with each other. Thereby, Big Data must be integrated in the Business Intelligence evolution. In contrary to the traditional business intelligence that is related to data warehouses, where companies are forced to manipulate an overabundance of data which come from different sources and that have a mixture of structured and unstructured forms. The Big Data era pushes developers to propose advanced architectures and infrastructures allowing data collection and analysis. The result of collecting and analyzing data can be used for the discovery of insights, for making decision and for supervising the socio-economic environment.

In this perspective, we discuss in this paper the impact of Big Data in the e-marketing field, and how Big data can improve the performance of this latter. The rest of this paper is divided into four sections. At the beginning, we shall present the state of the art of electronic marketing and provide relevant information for the understanding of its role and its importance. Afterwards, the main concepts of Big data will be explained by presenting their contribution in the modern companies. Thirdly, the coupling between e-marketing and Big Data will be explained by mentioning the

potentialities that can emerge through this coupling and who can bring an important added value to the companies. Finally, a conclusion with a brief summary will be discussed.

## **2. Electronic Marketing**

E-Marketing (Electronic Marketing) is also known as Internet Marketing, Web Marketing, Digital Marketing, or Online Marketing. E-marketing is the process of marketing a product or service using the Internet (Parminder & al, 2015). E-marketing not only includes marketing on the Internet, but also includes marketing done via e-mail and wireless media. It uses a range of technologies to help connect businesses to their customers in order to establish maintain and long-term relationship with them.

E-marketing covers a wide range of activities like advertising, customer communications, branding and loyalty programs by the internet. More than just the development of a website, E-marketing focuses on online communications, direct dialogue with consumers, who participate in the creation of new products, find effective ways to gain customer loyalty and support and facilitate their business process. In short, E-marketing is a set of activities based on rational exchange between enterprises and their customers in order to find, attract, win and retain them.

Indifferently to conventional or classical marketing that is focused on product and target markets, the electronic marketing has led to the evolution into a more customer oriented approach. We can understand this idea by analyzing the concept of a classical marketing mix which was introduced by Jerome McCarthy, in 1960. This mixture consists of the four elements, simply called four P's (McCarthy, 1960) shown in the following table:

<b>Marketing Mix Elements (P)</b>	<b>Description</b>
Product	Variety, quality, design, feature, brand name, packaging, sizes, services, warranties, and returns
Price	List price, discounts, allowances, payment period, and credit terms.
Promotion	Advertising, personal selling, sales promotion, public relations, and direct marketing.
Place	Channels, coverage, assortments, locations, inventory, transportation, and logistics.

**Table1. The 4 Ps Marketing Mix (Terri and William, 2003)**

However, the E-marketing is focused to reflect the customer centric and Internet perspective. Albert and Sanders (2003) have introduced in their book, E-Business Marketing, an enhanced marketing mix which consists of the four elements, called four C's. The descriptions of 4 Cs are listed in the table below:

<b>Marketing Mix Elements (C)</b>	<b>Description</b>
Customer Solution	Improved Products, services and ideas that customers are willing to buy.
Cost	Improved Price, reflecting the relationship between value and cost - customers are willing to accept higher costs for the products that provide higher added value and solution for their needs.
Convenience	Improved Place, via the Internet, use of multi-distribution channels based on customer preference.
Communication	Improved Promotion, targeted "real-time" communication with the customers.

**Table2. The 4 Cs Marketing Mix (Terri and William, 2003)**

As shown in the table above, the technology plays the most important role in the Cs marketing mix. To move towards the electronic marketing, the enterprise managers must adapt the relevant and current technologies to the philosophy of marketing and its management. Thereby, a strong online marketing strategy will help companies boost their business. Many strategies have been

proven to help companies improve their performance and that helps companies bring in more customers and retain new ones. Among these strategies we can mention:

### ***Website Design***

This tactic influences the amount of time and attention a user will spend on your page. Your website is the center of all your digital marketing efforts, so if your page is not clean, easy to read, and interesting, you're still going to lose customers.

### ***E-Mail Marketing***

This strategy means to contact customers directly with e-mails. It is a very popular strategy because of saving costs. This kind of e-mail is usually personalized and it consists of the company's brand, a message and a link which guides the customer to the website of the company (Susanne and Monika, 2015).

### ***Social Media Marketing (SMM)***

Social Media Marketing or SMM refers to the tools and practices used on social media to increase brand or company recognition and to initiate and manage web conversations within one or more targeted communities.

### ***Search Engine Marketing (SEM)***

SEM is regarded as a form of "pull" marketing whereby marketers sponsor a keyword on a search engine that is representative of their product or service. Their text listing then appears in a more favorable location when someone types in that particular keyword (Zorana, 2004).

### ***Affiliate Marketing***

It is an advertising mechanism by which a partner who is called affiliate promotes products or services from another company which is called merchant or affiliator (Lemmenett, 2014). Affiliates put for example banners or links of the merchant's website on their own websites to acquire customers (Susanne and Monika, 2015). The merchant remunerates the affiliate when the latter relays its advertising message and brings him a surfer who carries out, on his site, a specific action, previously defined in a contract by both parts ([www.e-marketing.fr](http://www.e-marketing.fr)).

### 3. Big data

The concept of Big data means a very big amount of data. This concept is also defined as “the amounts of data just beyond technology’s capability to store, manage and process efficiently” (Zikopoulos & Eaton, 2011). Therefore, and according to TechAmerica Foundation (2012) “Big data is a term that describes large volumes of high velocity, complex and variable data that require advanced techniques and technologies to enable the capture, storage, distribution, management, and analysis of the information.”.

This big amount of data can be found as structured, unstructured or semi-structured format, this can be reflected by the types of big data in the following figure:



Figure 1. Big data types

Big data are surrounded by five major features that represent a great field of challenge for developers. These features often called "5V model" for (Volume, Variety and Velocity), are shown in the following figure:

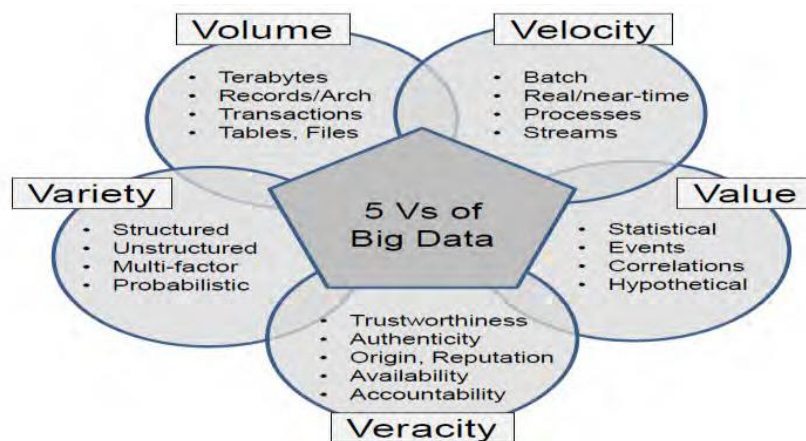


Figure 2. The 5Vs model of Big data (Esh & Nuradha, 2015)

**Volume:** refers to the quantity of data gathered by a company. This data must be used further to gain important knowledge. Enterprises are awash with ever-growing data of all types, easily amassing terabytes even petabytes of information. Volume is the most important and distinctive feature of Big Data, imposing specific requirements to all traditional technologies and tools currently used (Hiba & al, 2015).

**Velocity:** refers to the increasing speed at which this data is created, so, the increasing speed at which the data can be processed, stored, and analyzed by relational databases (Esh & Nurdha, 2015). Some activities are very important and need immediate responses, which is why fast processing maximizes efficiency. For time-sensitive processes such fraud detection, Big Data flows must be analyzed and used as they stream into the organizations in order to maximize the value of the information (Hiba & al, 2015)..

**Variety:** refers to the type of data that Big Data can comprise. This data may be structured or unstructured. Big data consists in any type of data, including structured and unstructured data such as text, sensor data, audio, video, click streams, log files and so on (Hiba & al, 2015).

**Value:** refers to the important feature of the data which is defined by the added-value that the collected data can bring to the intended process, activity or predictive analysis/hypothesis. Data value will depend on the events or processes they represent such as stochastic, probabilistic, regular or random (Hiba & al, 2015).

**Veracity:** When we are dealing with a high volume, velocity, and variety of data, it is not possible that all of the data is going to be 100% correct there will be dirty data. The quality of the data being captured can vary greatly. The data accuracy of the analysis depends on the veracity of the source data (Esh & Nurdha, 2015).

#### **4. E-Marketing in Big data era**

Big data has been introducing new channels of getting information from customers and markets, analyzing and using it in forms and scope which were not possible before. These channels impose many challenges to the use and the evolution of Big data such as the extraction of consistent insights

and knowledge from this crowdsourcing data. The latter must be transformed into patterns related to the company's activities. In addition, Big data imposes new challenges to the traditional way of data processing using relational data bases. Therefore, architectural solutions must be changed by including web support for collecting, filtering, clustering and analyzing this overabundance of data.

Due to these challenges, the sphere of Big data becomes the subject of numerous concerns where each one constitutes a step in the cycle of Big data applications. Among the concerns that have attracted much more the attention of the researchers we find the discovery, the retrieval and the catering of data (Obinna et al., 2015), we find also several works on the area of Big data integration (Hanan & Faiez, 2016). The clustering phase also knows an exceptional attention of the researchers (Olga et al., 2014) without forgetting Big data analytics used for examining large and varied data sets to propose new knowledge and patterns that can help managers in their decision makings (Martin et al., 2018).

Despite the challenges cited above, the alluring explosion of available data and the competitive context increases the tendency to base marketing decisions on data rather than on simple intuitions. According Maheshwari (2015), there are two main types of decisions: strategic and operational. Wise use of data can have a positive impact on both of the types. In the strategic decision, the use of past data helps to reduce the doubts by taking into account similar cases and analyzing many potential scenarios. New ideas can also be generated through pattern recognition. All four main categories of marketing strategic decisions (product, price, place and promotion) can be facilitated by using both internal and external data (Daniil, 2018). On the other hand, operational decision mostly uses past data. We can create a classification model using the data of past instances to develop a good model of the domain. This model will then be used to improve and often automatize operational decisions in the future.

A good exploitation of big data combined with marketing strategies would have a significant impact on the activities of a company through Big data analytics. This latter enables companies to

make high probability predictions about trends while also allowing them to hone in on strategically targeted marketing.

The goal of any analytics solution is to provide the organization with actionable insights for smarter decisions and better business outcomes. Different types of analytics, however, provide different types of insights. So it is important for managers to understand what each analytics type delivers and to match analytics functions to the organization's operational capabilities across its real estate, facilities and asset management functions.

Analytics solutions are of three principal types (Software IBM, 2013):

- Descriptive, which uses business intelligence and data mining to ask: "What has happened?" Descriptive analytics mines data to provide trending information on past or current events that can give real estate, facilities and asset managers the context they need for future actions
- Predictive, which uses statistical models and forecasts to ask: "What could happen?" predictive analytics provides answers that move beyond using historical data as the principal basis for decisions. Instead, it helps managers anticipate likely scenarios so they can plan ahead, rather than reacting to what has already happened.
- Prescriptive, which uses optimization and simulation to ask: "What should we do?" prescriptive analytics explores a set of possible actions and suggests actions based on descriptive and predictive analyses of complex data. Though the final decision is up to the facilities and asset manager, prescriptive analytics solutions can provide a reliable path to an optimal solution for business needs or resolution of operational problems.

The three types build on one another, with descriptive analytics being the most common and prescriptive analytics the most advanced. Yet they share goals for improving real estate, facilities and asset operations with capabilities that help provide an understanding for an event or action, uncover relationships in data, develop what-if scenarios and simplify business decisions. As a result, marketers can gain through the analysis in several ways, namely:

- Customer engagement. Big data brings the opportunity to considerably enlarge the base of knowledge about a customer. The main concern of the past was to find out who are the people buying a product and who may be turned into customers. Nowadays, one can get access to information that will lead to knowledge of customers' location, tastes or preferences in terms of when and where to be contacted, for example (Daniil, 2018).
- Customer retention and loyalty. Big data also comes in handy when the relationship with a customer has already been established. The more interaction with customers a company has, the more information it can gather and the better it can understand what impacts customers' decisions (Daniil, 2018).
- Marketing optimization and performance. Continuous testing and analysis can help not only in cutting the costs of marketing operations, by calibrating the spend between channels, but also to optimize the marketing programs (Daniil, 2018).
- Companies can know what is written about them, their products, their markets, their competitors. The study reputation or opinions can be conducted through the analysis of reviews on the Internet and conversations on social networks.

Big Data is not just a question of tools but of strategy and requires reflections and choices in terms of organization. The question should be treated as a real project and the organization should be chosen in relation to the actual needs of the company. The purpose of this Big Data management and the intended uses must be defined.

The implementation of a Big Data management requires a high coordination between the different services of the company. It involves IT departments, sales marketing departments and customer relations departments. Sometimes contradictory objectives between the financial department, the marketing and the supply chain must be flattened and reconciled.

Big data management poses certain challenges which are mainly related to marketing. , among the most relevant challenges we list:

1. Selection of the right information (veracity of information)

Big data refers to an extremely large amount of information. Marketers wonder how to separate all the junk, irrelevant and unreliable information from the piece which can bring value. Therefore companies should carefully select appropriate data sources (Spiegel, 2014).

## 2. Fast pace of changes

In Big data every day new sources and types of information can be discovered. Thereby, new methods of data processing are being introduced periodically. Therefore, companies use services of independent data scientists for certain projects.

## 3. Lack of experts

Big data is a relatively new concept which requires a team of data scientists, analysts, developers and managers. But unfortunately, there are not enough properly educated and skillful experts (Spiegel, 2014).

## 4. How to get value from unstructured data

Unstructured data (or unstructured information) is information that either does not have a pre-defined data model or is not organized in a pre-defined manner. Examples of unstructured data are academic publications, documents, blog posts, videos, photos and audio samples. Since that information cannot be put into any framework, it is much more difficult to use any automatic methods of data mining and analysis.

## 5. Security

Big data security is the collective term for all the measures and tools used to guard both the data and analytics processes from attacks, theft, or other malicious activities that could harm or negatively affect them.

## 6. Software

Hadoop is one of the most widely used software solutions for big data processing, and it is indeed a very convenient tool for data mining and analysis. However, because of the aspects such as the newness of the concept and lack of talent, it is hard to master it. In the survey by Qubole, 73% of

the respondents claimed to understand the Big Data platform was the most significant challenge of a big data project (Qubole, 2017.)

## **5. Conclusion**

In this paper, we have introduced the use of Big data in E-marketing tasks. Big Data and analytics are improving the classical marketing strategies. Technology allows companies to track digital activities of millions of people through a variety of different techniques that allow companies a personal look at consumer behavior and purchasing habits. Data collection and especially marketing data can offer many benefits by aiding those in the marketing business to make better decisions.

A good exploitation of big data combined with marketing strategies would have a significant impact on the activities of a company. Using the information shared daily by web users and digital tools, Big Data has quickly become indispensable for marketing professionals. They put customer knowledge at the heart of the decision-making process and their communication campaigns.

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