

The role of big data in developing E-commerce platforms in Algeria

دور البيانات الضخمة في تطوير منصات التجارة الإلكترونية في الجزائر

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Abstract:

In this article, we tried to present a theoretical concept of big data in general, and E-commerce platforms, then attend to project these concepts, to the case of Algeria. Through a survey directed to a sample of (640 Algerians), to know the extent to which they use E-commerce platforms, and the characteristics of this sample, in order to provide an idea of how to use this digital data that can be collected from different sources , and exploit it in order to develop and improve E-commerce in Algeria.

Keywords: Big Data - E-Commerce - Personal Data - Data Analysis- Algeria

JEL Classification : C81- L81- c55 – l86

ملخص:

في هذا المقال ، حاولنا تقديم مفهوم نظري للبيانات الضخمة بشكل عام ، ومنصات التجارة الإلكترونية ، ثم إسقاط هذه المفاهيم على حالة الجزائر. من خلال استطلاع موجه لعينة من 640 مستهلك جزائري، لمعرفة مدى استخدامهم لمنصات التجارة الإلكترونية ، وخصائص هذه العينة ، وذلك لتقديم فكرة عن كيفية استخدام هذه البيانات الرقمية التي يمكن جمعها من هذه المنصات واستغلالها لتطوير وتحسين التجارة الإلكترونية في الجزائر.

الكلمات المفتاحية: البيانات الضخمة - التجارة الإلكترونية - البيانات الشخصية - تحليل البيانات - الجزائر

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1- Introduction:

Big data and features it provides increasingly spread over all sorts of industries and niches, granting companies and entrepreneurs unprecedented process optimization, service quality boost, and conversion rates increase opportunities. That's why More than 91% marketing leaders believe companies take a decision based on the customer data and 85% of large corporates are using social media to drive as a marketing tool (HDFS Tutorial Team, 2018).

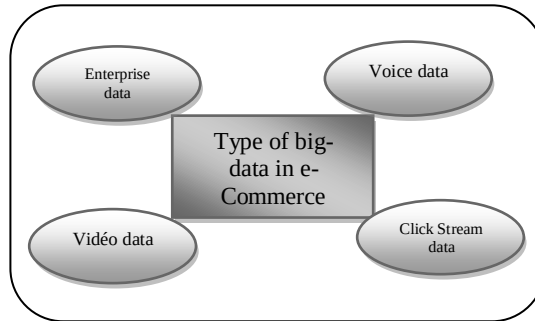
Big data in E-commerce has already helped businesses worldwide save over \$1 Trillion throughout 2020, while the retail sector is expected to get a 13.2% CAGR revenue boost by using big data in E-commerce. These statistics obviously indicate a rising number of big data investors among E-commerce market players in the nearest couple of years. (Igor Braginsky, 2021).

According to IBM, 2.5 billion gigabytes of data generated every day. Currently, an estimated over 2.5 quintillion bytes (2.5 e+9 GB. and over 90% of these data are collected within just the past 5 years (KARKI, 2020).

Moreover, it's estimated that the digital universe of data will grow 61% to 175 zettabytes by 2025. E-commerce represents a large chunk of this digital universe accumulating customers' social media activity, geolocation services, web browser histories, and abandoned online shopping carts (Christal Bemont, 2019).

E-commerce applies to online payments: whether in each purchase, selling products and facilities on the web. Information in ecommerce is the cornerstone to monitoring customer buying behavior to tailor deals that are gathered across time using user tracking and purchase rates. The different types of big data used in E-Commerce are: (Ritesh Singh, 2020).

Figure 1: Role of E-commerce in BigData



Source: : Ritesh Singh, Nisha Verma and Manali Gupta, Role of E-Commerce in Big Data, International Journal of Advanced Research in Engineering and Technology, 11(12), 2020, pp. 1770-1777. <http://iaeme.com/Home/issue/IJARET?Volume=11&Issue=12>

In Algeria E-commerce has witnessed a great development, especially in the last ten years, coinciding with the development and expansion of the use of the Internet via smartphones and social media websites. Which generates a large amount of big data, which is an important sources that can exploited in many fields, including e-commerce.

Big Data partnership is a big advantage for the e-commerce business and the traffic behavior of an ecommerce shop is seen. This traffic may be more commonly visited by search engines or web advertising. Collection of data that connects a person more often than not, such as in Facebook, tweets created by users about a specific product. (Gao, 2021)

From what has been presented, and assuming there is a large amount of random and ordered data collected from different sources, with the large trend for E-commerce activities in Algeria, we can propose the following question:

- ***To what extent can big data collected about customers using to develop E-commerce in Algeria ?***

1-1 Hypotheses development

This study explores ‘Big Data’ in E-commerce environment in Algeria, which refers to the huge quantities of transaction, click-stream, voice, and video data in the e-commerce landscape (Zhou, 2017).

The study embraced a systematic approach to establish rigor throughout the review which was based on a similar approach used by (Gao, 2021) and (Igor Braginsky, 2021)

The study was grounded in a literature review to identify and appraise the current knowledge on the definitional aspects and attempt to highlight the Algerian case by presenting and explaining how can big data can be collected and gathered in a hand and how it can be used in Algerian market through different growing ecommerce platforms in an other hand (SA, 2020)

Therefore, the following hypothesis can be proposed.

With 26.35 million internet users in January 2021. And The number of internet users in Algeria increased by 3.6 million (+16%) between 2020 and 2021. According to (SIMON, 2021) we assumed that There is a huge trend towards E-commerce activities in Algeria: from both costumers and sellers because of the extending of the internet use and the abundance of digital devices more than ever.

1-2 Study objectives:

Proceeding from the problem posed in the study, which aims to clarify the uses of big data in E-commerce, the study aims in addition to reaching:

- Understanding the concept of big data in general.
- Trying to explain the relationship between Bigdata and ecommerce
- presenting different characteristics of Algerian consumers (volume, used devices...ect) related to the E-commerce activities through a sample.
- - propose examples about the applications of big data on ecommerce and how it can develop E-Commerce in Algeria markets.
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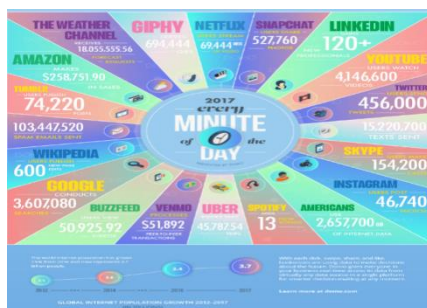
2- Theoretical framework

2-1 Big data definition

Big data is a large and complex data that has its own unique characteristics such as volume, speed, diversity, variance, and validity. Which cannot be treated using traditional technology, but rather requires modern programs and methods in order to process, store, analyze, research, share, transfer and visualize it with the need to preserve its privacy (Igor Braginsky, 2021).

According to an article published in Forbes (Marr, 2015), data is growing faster than ever, about 1.7 megabytes of new information will be generated every second for every human being (Nanji, 2017).

Figure 2: Big Data Uses Every Minute



Source: Nanji, Ayaz, The Incredible Amount of Data Generated Online Every Minute, article on MarketingProf, 2017.

2-2 Big Data Characteristics:

There are major characteristics of big data, which are as follows: (Gayatri Kapil, 2016)

- **Volume:** the volume of data extracted from a source, which determines the value and volume of data to be classified as big data, and in the year 2020, cyberspace exceeded nearly 40,000 megabytes of data ready for analysis and information extraction.

- **Variety:** It means the diversity of extracted data that helps users, whether they are researchers or analysts, to choose the appropriate data for their field of research. It includes structured data in databases and unstructured data such as: images, clips, audio and video recordings, short messages, call logs, and GPS map data. In addition, it requires time and effort to prepare it in a suitable form for processing and analysis.
- **Velocity:** It means the speed of producing and extracting data to cover the demand for it, as speed is a crucial element in making a decision based on this data (Oracle, 2013), and it is the time we take from the moment this data arrives to the moment the decision is made based on it.
- **Reliability:** It means the reliability of the data source, the accuracy, validity and up-to-dateness of that data, as there is one CEO out of every three managers who do not trust the data presented to them to make a decision. There are also studies estimating that the damage of bad data to the US economy estimated at 3 trillion dollars annually. (Redman, 2016)

There also other's big data characteristics beside of these four main we must know about. Big data must contain Visualization, Virality, Viscosity, Venue, Vocabulary, Vagueness and Complexity (Gayatri Kapil, 2016) . The more we get organized data the more it was more efficiency.

2-3 Big data sources

According to (Domenech, 2018), there are many sources of big data, including:

- **Sources arising from the management of a program:**

A governmental or non-governmental program, such as electronic medical records, hospital visits, insurance records, and bank records.

- **Commercial or Transaction Related Sources:**

It is data arising from transactions between two means, for example credit card transactions and transactions conducted via the Internet, including by mobile devices. Moreover, we will focus on in the second part of this article this type

- **Networks Sensors Sources:**

Satellite imaging, road sensors, and climate and air pollution sensors.

- **sources of GPS trackers:**

For example tracking data from cell phones and GPS

- **Sources of Behavioral Data:**

For example: times to search on the Internet for a product or service or any other type of information, and times to view a page on the Internet

- **Sources of opinion data :**

For example comments and opinions on social media such as Facebook and Twitter.

2-4 How Big Data can impact E-commerce

Big Data allows E-commerce companies to use data more effectively, achieve a greater conversion rate, boost decision making and encourage clients.

- **Improved Shopping Experience:** Big data capacities are essential in predictive analytics practices, which help analyze user behavior patterns, optimize user experience accordingly, pinpoint and predict user demands, and conveniently shape the overall picture of the shopping experience you provide. Here, the technology allows for rapid, massive analysis of user-generated data that is gathered from actions users implement in one's online store or marketplace.
- **Shopping Personalization:** Targeted advertising and various user personalization approaches are hugely relevant in the niche of E-commerce. And with big data, you get to implement big personalization — a set of practices aimed at tailoring advertising campaigns in direct accordance with the TA needs by thoroughly monitoring and gathering

commercial user information (most frequent types of requests, browsing preferences, etc.).

- **Payments Security** :The prime capability of big data to analyze massive sets of data enables payment processing engines to better pinpoint fraudulent activities within flows of online payments and cybercriminals are restricted in malicious manipulations. This grants an ultimately safer shopping experience. Big data-driven algorithms, for instance, are used by PayPal in order to employ the machine learning opportunities and make their system smart at detecting frauds among millions of transactions.
- **Properly Balanced Pricing**: Big data analytics capacities can also be used to form prices balanced out in accordance with both your business plan and target audience demands. Yes, big data seems to be just the right tool for pinpointing that fine line between sustaining the budget and satisfying target customers' pricing desires. Not mentioning the mass processing of data related to competitors' operation in the market, customer profiling, and sales channels consolidation which affects the growth of general sales in the most positive way.
- **Real-Time Service Adjustments**: With the in-depth analysis of levels of customer satisfaction, detection of issues related to order processing and delivery, and other opportunities at defining points of customer satisfaction and perception, big data enables you to dynamically adjust to the relevant commercial situation. And if you know how to satisfy your customers properly, you can efficiently retain them, accumulating profits and sales growth accordingly.

-As we can see, big data impact on E-commerce is invaluable. More so, technology is currently among the main shaping “pillars” of eCommerce practices and approaches worldwide. Now that we know what it does and what it can do for

eCommerce management and growth, let's take a look at how it all works in real-life field practice.

- **Efficient Marketing Tasks Handling** The primary role of big data in E-commerce also concerns various marketing tasks and workflows. Thus, commercial big data processing spawns big regular volumes of invaluable marketing analytics assets. This helps make efficient marketing forecasts, optimize budgets based on specific market patterns, pick operational environments more efficiently, and target the most potentially profitable new audiences.

- **Smart Customer Support Chatbots** :-Last but not least important among big data use cases in E-commerce is the connection with automated AI-powered customer support chatbots. Such “technological collaboration” gives you yet another efficient way of collecting invaluable user data and honing your marketing approaches in real-time. This is where smart bots will help you gather data by the custom-set criteria and sort it right away accordingly, which saves time and effort in the long run.

2-5 E-commerce platforms

E-commerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that facilitated through the internet (Nanehkaran, 2013)

- E-commerce in Algerian

Market is growing, but it is far from reaching its potential. There are no official figures for online sales in Algeria. However, according to the Algerian National Association of Traders and Craftsmen, the market potential estimated to be \$5 billion. To boost E-commerce the government is seeking to increase the rate

of Internet penetration and bandwidth. While the first Algerian online markets appeared in 2009, e-commerce began to take off in 2014 with the arrival of the Pan-African site Jumia, which remains the country's most popular online sales site. OuedKniss, Batolis, and IdealForme are the leading local online sales sites besides of Jumia.

In February 2018, the Algeria government adopted a law that defines the country's first e-commerce regulations, which stipulate that online markets must host their website in Algeria and registered at the Algerian Commercial Registry. The law prohibits any online purchase of tobacco and alcoholic beverages, as well as medicines, online gambling, and gaming services. Under the current law, Algerian citizens cannot purchase items online from abroad. Businesses, however, may buy items foreign items online for internal use. American businesspeople interested in online sales should note that the use of private credit cards is very limited in Algeria. Algerians have only recently started to use international credit cards (e.g., Mastercard and Visa) issued by local banks and accepted for use abroad. (Euromonitor, 2020)

- Algerian E-commerce sales and customers

The number of e-commerce customers reported to have reached 2.45 million in 2017 - 6% of the country's population - according to Hootsuite and Jumia surveys. The Algerian e-commerce market does not have a perfect gender balance: while 9% of the total male population reported to shop online, that rate goes down to 2% in the female population. The growth in e-commerce sales expected to boost by mobile in the upcoming years as the smartphone penetration rate rose to 32.4% in 2017, reaching over 13 million devices (Newzoo Global Mobile Market Report) and 61% of Jumia customers use their phones to access the platform. Electronic devices, telephones, house and cleaning products as well as clothing items are among the most popular types of product on online

marketplaces. E-payment systems introduced in the country at the end of 2016, and since then online shopping has grown rapidly. Following that trend, Algeria Poste (Algerian National Postal Services) is set to introduce an electronic wallet in 2018 to facilitate online purchases, which should further boost e-commerce. Currently, cash on delivery is the preferred payment method among Algerians, as in most countries in the Arab world and Northern Africa. (SA, 2020).

3- Research method and data collection

In order to achieve the objectives of the study, a questionnaire was prepared and distributed to a sample of 650 via the Internet using “Google Drive” and distributed to a random sample of customers distributed across the entire Algerian national territory, 640 of correct samples were retrieved, to focus on the following main points.

- E-commerce platforms used by the sample in order to know the extent and the most of them used sites in Algeria
- Get personals data from the sample members, such as gender and age categories, which is one of the most important big data extractions that can be used later after being arranged and processed to be used for various goals
- The devices used to browse these platforms; as such, information is very useful in analyzing the nature and behavior of customers and anticipating their needs after linking these various collected data.
- Frequencies of accessing and dealing with E-commerce platforms in Algeria in order to know the volume of big data that can be collected, which can be said that it is constantly increasing according to the various previous studies that we relied on in the theoretical aspect of this study (SA, 2020).

The results concluded the following:

3-1 The E-commerce platforms most using in Algeria

Table1: E-commerce website more using

classification		Website and platforms	
1		OUEDKNISS	533
2		FACEBOOK MARKET	492
3		YASSIR MARKET	206
4		JUMIA	154
5		ALGERIE STORE	131
6		OTHERS	898

Source: By researcher depending on sample's results

According to the answers of the sample members, we found that the most E-commerce platforms used are:

- **Ouedkniss:** is one of the first E-commerce websites existed in Algeria, as it allows users to post their various ads according to different classifications. It is the number one site in Algeria according to the sample members (533), and most users are interested in the cars market in particular.

Jumia: a platform that considered as an electronic market directed to all African countries and its location in Europe. This floor characterized by its expansion in recent years in Algeria (154). It also characterized by the distinctive products and services that it provides with delivery services and the customer relationship management system (crm).

- **Facebook store:** It is a floor belonging to the Facebook website, which allows Facebook users to publish their various advertisements related to various goods and services, which can reached by searching in the place or according to people's interest. The Facebook site relies heavily on personal data collected through user accounts and their various interests through publications and

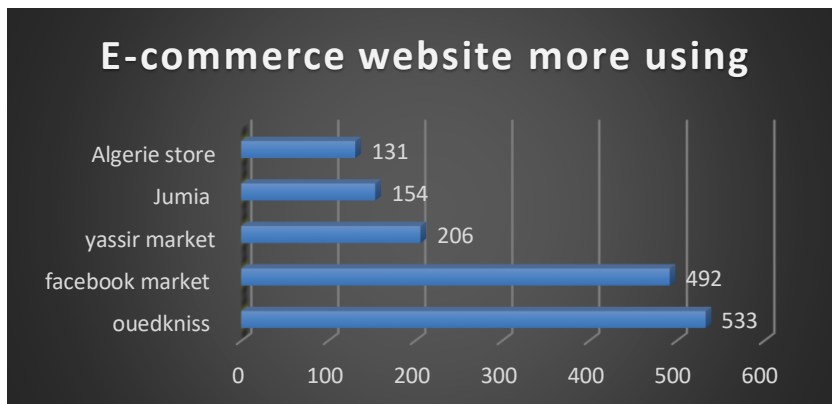
research they do on the site, then using that data to determine the interests and behaviors of individuals and then displaying various products that meet their requirements.

- **Yassir market:** YassirCompany launched as an emerging institution in the field of transportation services, allowing owners of personal cars to use them in the commercial field, by organizing them using a database and an application via smart phones. After the company achieved success, it headed towards establishing a platform that considered as an electronic market, which met with great success and expansion by relying on the database of customers that it gained in its first activity.

- **Algerie Market:** Also, a platform that regularly displays various products adopted with the Algerian environment. Which receives daily a significant number of new followers.

- **Other E-commerce platforms:** In addition to the previous websites, which considered the most used in Algeria according to the sample surveyed, we find many other leading websites in the field of E-shopping in varying proportions, including Tem Tem, Amir Shop, and D15...etc.

Figure 3: E-commerce website more using



3-2 Distribution of the sample according to gender

According to the sample, it contain 399 males which is 62% besides 241 females 38%, and this indicates that the percentage of males is higher in terms of browsing and dealing with e-commerce websites. This information is very important when big data is collected. Knowing the gender helps a lot data analyzers and websites owners in the marketing policy of the products later.

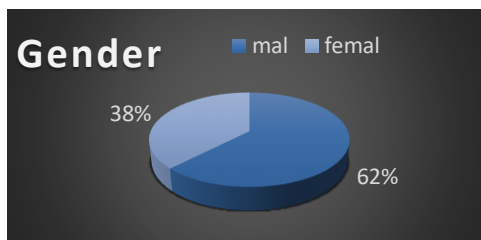
The value of big data (organic, unstructured data) for monitoring the sustainable development goals (SDGS) in relation to women. Research methods included a landscape review, interviews with UN women and global pulse experts, and others in international development.

A (UN Women) report presents the benefits of big data (for example, real time data), risks (for example, elite capture and privacy), and policy implications (for example, how it can be incorporated in project cycles from planning to evaluation). It ends with a compendium of gender-related big data projects and their relevance to the SDGS (Bailur, 2018).

Table2: sample / gender

Gender	Mal	Femal
640	399	241

Figure 4: sample / gender



Source: By researcher depending on sample's results

3-3: Distribution of the sample according to age

The survey results shows 18.75% of the users of shopping sites are under 18 years old, while 12.96% are between 41 and 55 years old, and only 1.87% of the sample members are over 56 years old.

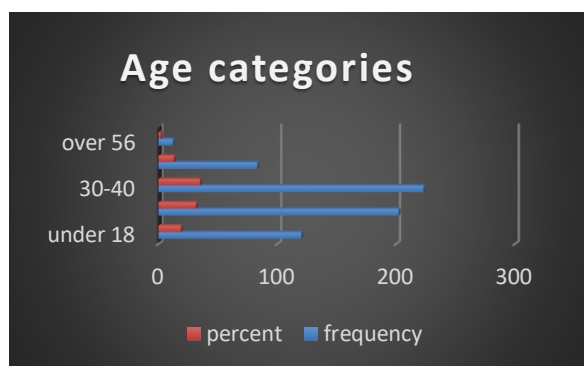
Most of the age groups according to the sample exceed 65%. In addition, 31.56% of them are between 19 and 22 years old, while 34% of them are between 30 and 40 years old.

This seems logical, since young people are more use of technological means and was keeping pace with various developments. Age is also an important indicator in taking a general idea during data analysis, especially in the field of E-commerce activity in order to help link information's with the age indicator and the nature of the products to marketers.

Table3: sample according to age

Figure5: sample according to age

age categories	frequency	percent
Under 18	120	18.75
19-29	202	31.56
30-40	223	34.84
41-55	83	12.96
over 56	12	1.87
640	640	100.00%



Source: By researcher depending on sample's results

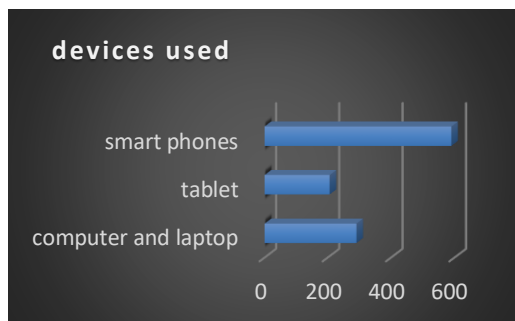
3-4 Devices Used For E-Commerce

According to the results of the surveys, the devices used by costumers to browse various websites were largely through smart phones, with a percentage of 92.15%, while 45% of them used fixed and laptop computers mostly from their homes or workplaces, while 32% used tablets.

Of course, it is important to mention here that the methods used play a remarkable role, especially for smart phones, which can extract the locations of individuals by GPS technology, which is an important element in the nature of the data extracted and collected for later use.

Table4: Devices Used For E-C

Devices Used	Frequency	Percent
computer and laptot	291	45.55
Tablet	206	32.33
smart phones	590	92.15

Figure6: Devices Used For E-C

Source: By researcher depending on sample's results

3-5 Use E-commerce platforms to search for products, prices, and buy.

One the important data form that can extracted from is being aware of the frequencies of individuals' use online shopping. The results of the survey showed that 26% use the sites once a week, while 67.18% accessing daily in order to search for various products, know prices and other information.

In addition to submitting purchase orders, which indicates that there is a great use by the Algerians, and here we can actually consider that we are heading towards electronic commercial transactions. It should also be noted that the greater the use of digital data, the more digital data could be used to create customer databases for later references.

Table5: E-commerce browsing frequency

Frequences of using E-commerce	Frequency	Percent
Daily	430	67.18
Weekly	170	26.56
Monthly	30	4.68
More than a month	10	1.56
	640	100

Source: By researcher depending on sample's results

Figure7: E-commerce browsing frequency



Source: by researcher depending on sample's results.

3-6 How can possibly big data develop E-commerce?

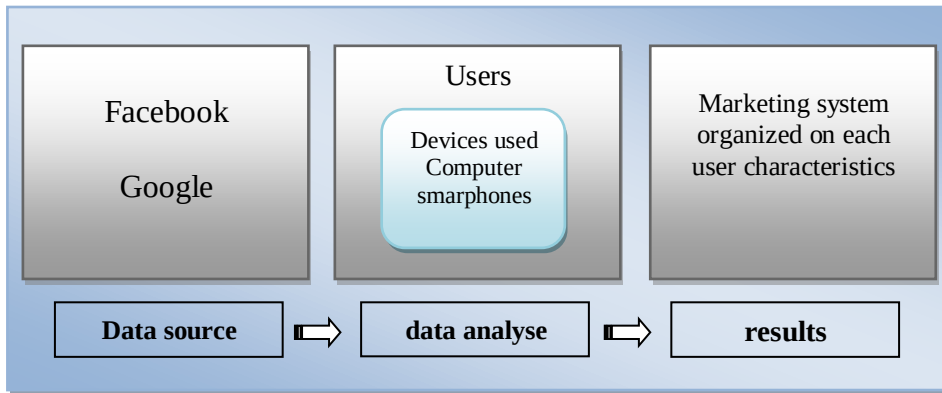
In order to facilitate the idea of the impact of big data on electronic commerce, let us assume the following example

lets suppose a user has a Google account and the same account is linked to the Facebook , and uses a smartphone and a computer in order to browse various websites and download applications, which collects a huge amount of data about this particular person, specifically its tendencies, interests, ...etc.

here where data analyse role comes when this user uses and browsing the Internet, often without intending to search for specific products and services for a commercial purpose, is exposed to advertisements that suit his immediate interests, which were analyzed based on the private data collected about him.

For example, a certain person will have a baby soon, he will often search on the Internet for informations about the baby and what needs to be done, in the same period, he will start receiving various advertisements related to the clothes of young children or the tools used in raising newborn children. For the seller who provide these Products, its onlines ads will be directed to individuals who have more interest in these products in the same period, and all this is done through the use of algorithms used in big data analysis.

Figure8: How can possibly big data develop E-commerce?



Source: researcher's perception

we can conclude the effective role that big data can play in developing and improving E-commerce services in Algeria, as the collection and preparation of various data allows it to be used later in many purposes, which can provide examples like:

- **Build an effective CRM system:**

It is possible to build a precise CRM system by the collected data, through a better and well understanding of customers. More than that, an understanding of the psychology of individuals in an advanced way with the help of artificial intelligence (AI) systems that focus on the most important details and link between the various elements available by processing Big data which is a golden opportunity for marketers.

- **Improve customer's services:**

Building an effective and advanced communication system that necessarily leads to the improvement of services for the provision of customers and access to the implicit desires of them. Which cannot be achieved through traditional processing of customer data, as artificial intelligence (AI) system have been linked

to the basics of neuro-marketing science that used in the commercial field, and provides options and features that suit both the seller and the buyer.

- **Introduce successful products:**

What successful products mean here, is the exact desires of consumers by providing services and goods that suit the real desires of them by various qualities and types. With the different characteristics of each individual separately, and thus the use of big data provides the opportunity to directly access the real demands of individuals for the seller as customers avoid time and fatigue in Choose what he really wants.

- **Develop new strategies for online payment:**

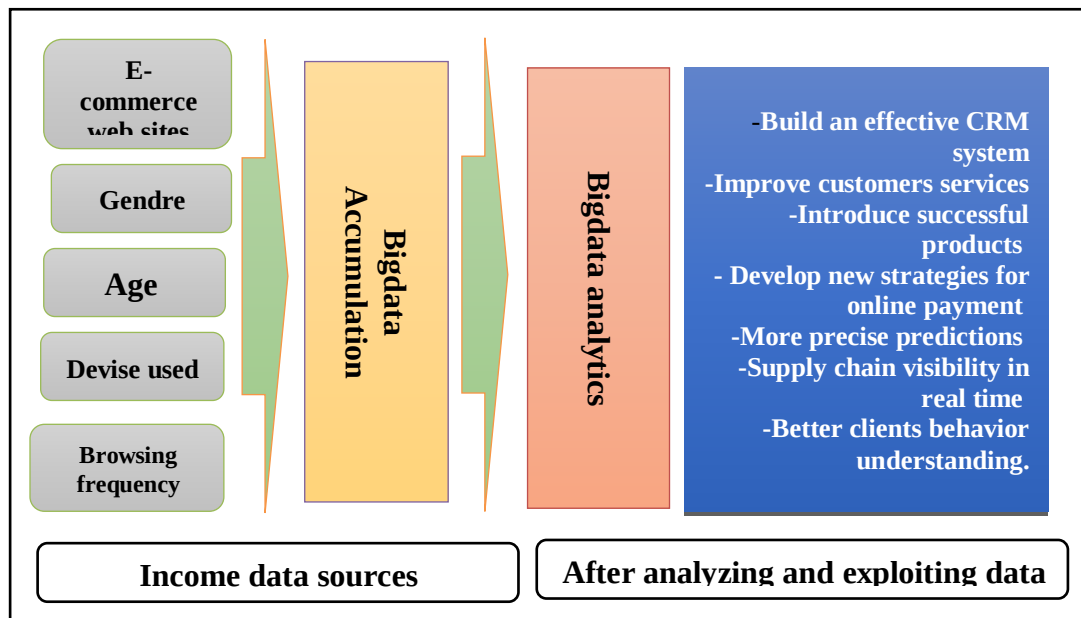
One of the most important features of electronic shopping is the online payment feature. This point in particular requires a strong protection system and requires accurate knowledge of people who own electronic payment cards, of course with artificial intelligence (AI) techniques they provide advanced features based on the analysis of personal data of individuals.

More precise predictions As we mentioned earlier, through the analysis of big data, it greatly helps in analyzing the available data in order to provide information that serves as future forecasts for the desires and requirements of individuals, which allows accurate follow-up of the market and from that the formulation of various appropriate strategies

- **Better clients behavior understanding:**

A good understanding of the psychology of customers depends mainly on tracking their past behavior and determining, their behavior in the field of commerce or otherwise, as the personal tendencies of individuals such as the favorite color or the series that the person is watching now can provide great information that helps in formulating the type and shape of the product that will meet his desire if it is Exposure to it, of course, with the help of artificial intelligence (AI) systems that are used to analyze big data.

Figure9: Big data contribution in developing E-commerce



Source: researcher's perception

The figure try to describe how possibly big data can develop E-commerce in Algeria, and the steps it take from pure digital data into a useful options in E-commerce field.

It should note here that these presented examples are a small use of what can be done through the exploitation of big data, as its uses far exceed the size of our imagination, and remain open to users in employing them in a way that helps them and achieve their goals under various circumstances such (covid19) pandemic period.

4- Conclusion

From everything that was discussed in this article, we find that big data is the wealth of the current period through the various characteristics that it contains and its various forms, despite being complex ,large and related to almost everything

related to our daily life .Especially that we live in a world today fully connected to the Internet and its various uses.

In Algeria, there is a great trend towards the use of electronic shopping sites of all kinds. Which confirms the existence of a large amount of collected digital data that can employed, whether by official governments companies, such as ministries and directorates or by economic institutions.

In the current period (covid19) especially, where we have noticed a great trend to transform electronic transactions in the world. Algeria, like other countries in the world, witnessed a great rush to deal from a distance due to the quarantine procedures, as the Algerian client became aware of various E-commerce sites, which were highly acclaimed. Where we found through the results of the survey that there is a greater use of E-commerce sites more than ever. Most of them are young people between 20 and 30 years old (**fig4**), including women and men (**fig4**) who mostly use smart phones and deal daily with several of these sites (**fig6**). This confirms the hypothesis proposed that there is a reality directed towards E-commerce in Algeria, and we conclude that there are huge data resulting from these transactions, which can be exploited in order to achieve many goals (**fig9**).

For sure, the degree of exploitation remains relative and linked to the extent of the actual interest in this field. Whether by the official authorities in the first place, or different economic institutions.

As we find that many countries in the world, including the Arabs, are racing towards exploiting this electronic wealth and focusing on establishing a special government cell interested in organizing and developing electronic activity in various fields, including the commercial field. Which is not available here in Algeria yet, although it seeks, in its various governmental programs, to focus on digitization and achieve development in various fields in cooperation with various economic partners.

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