

Big Data's Impact in Telecoms: Djeezy Algeria Case Study

Fares Gater^{1,*}, Allaeddine Zeroual², Toufik Hannachi³

¹Entrepreneurship and organization management laboratory, Larbi Tebessi University, Tebessa, Algeria.

²Entrepreneurship and organization management laboratory, Larbi Tebessi University, Tebessa, Algeria

³Entrepreneurship and organization management laboratory, Larbi Tebessi University, Tebessa, Algeria

تأثير البيانات الضخمة في قطاع الاتصالات: دراسة حالة جازي الجزائر

فارس قاطر^{1*}، علاء الدين زروالي²، توفيق حناشي³

¹ مخبر المقاوالاتية وإدارة الأعمال، جامعة الشهيد الشيخ العربي التبسي - تبسة الجزائر.

² مخبر المقاوالاتية وإدارة الأعمال، جامعة الشهيد الشيخ العربي التبسي - تبسة الجزائر

³ مخبر المقاوالاتية وإدارة الأعمال، جامعة الشهيد الشيخ العربي التبسي - تبسة الجزائر

Received: 29 / 04 /2026

Accepted: 02/ 06/2026

Published: 12 / 06/2026

Summary: Big Data has emerged as a rapidly growing phenomenon in today's technological era. Technologies such as cloud computing, social media, and mobile communications, among others, are generating massive volumes of data. Big Data technologies aim to extract economic value from these vast datasets through high-speed acquisition and advanced analysis.

This study aims to shed light on Big Data technology and explore its applications in the telecommunications sector, with a special focus on a case study of Djeezy, a leading mobile operator in Algeria. The study adopted a descriptive-analytical approach using the SWOT analysis framework.

The findings reveal that Big Data has significantly contributed to enhancing decision-making processes, improving customer behavior analysis, streamlining internal operations, discovering new business opportunities, and fostering innovation within the company. The study also highlights notable challenges related to data privacy, security, and legal aspects.

The study recommends continuous investment in Big Data infrastructure, employee training programs, the establishment of a robust data governance framework, and strict adherence to ethical and regulatory standards.

Keywords: Big Data, Telecommunications Sector, Djeezy, SWOT Analysis, Innovation.

Jel Classification Codes: L86 ; C80 ; C55.

ملخص: تعد البيانات الضخمة ظاهرة متسارعة النمو في عصرنا الحالي، حيث تساهم تقنيات مثل الحوسبة السحابية، وسائل التواصل الاجتماعي، والاتصالات المتنقلة في توليد كميات هائلة من البيانات، حيث تهدف تقنيات البيانات الضخمة إلى استخراج قيمة اقتصادية من هذه البيانات من خلال اكتسابها وتحليلها بسرعة عالية.

تهدف هذه الدراسة إلى تسليط الضوء على تقنية البيانات الضخمة واستكشاف تطبيقاتها في قطاع الاتصالات، مع التركيز على دراسة حالة شركة جازي في الجزائر. اعتمدت الدراسة المنهج الوصفي التحليلي باستخدام أداة تحليل SWOT.

أظهرت النتائج أن البيانات الضخمة ساهمت بشكل كبير في تعزيز عمليات اتخاذ القرار، وتحسين فهم سلوك العملاء، وتبسيط العمليات الداخلية، واكتشاف فرص أعمال جديدة، وتعزيز الابتكار في الشركة. كما أكدت الدراسة على وجود تحديات تتعلق بخصوصية البيانات والأمن والجوانب القانونية.

وتوصي الدراسة بضرورة الاستثمار المستمر في البنية التحتية للبيانات، وتدريب الموظفين، وإنشاء إطار حوكمة بيانات قوي، مع الالتزام بالمعايير الأخلاقية والتنظيمية.

الكلمات المفتاحية: البيانات الضخمة، قطاع الاتصالات، جازي، تحليل SWOT، الابتكار.

تصنيفات JEL: C55؛ C80؛ L86

1.Introduction

The world is currently witnessing an enormous proliferation of data. Processing and managing this data increases the accuracy of understanding and identifying customer requirements, thereby improving quality and productivity while reducing losses for various business sectors. Data is growing at an unprecedented rate due to the massive increase in the number of electronic devices, the spread of cloud computing, and sharing activities on social media applications.

Big Data technologies represent a new generation of techniques designed to extract economic value from vast volumes of diverse and complex data sets. Various enterprises and sectors are investing in Big Data technologies, enabling them to derive commercial value from their massive data pools. Telecommunications companies are employing Big Data technologies by integrating risk, customer, and network analytics, enhancing information technology security, and accelerating advancements in business operations.

The present study attempts to shed light on Big Data technology, understand its nature, and explore how it can be applied in the telecommunications sector. This is achieved through an analytical study of a set of research conducted in this field to identify the key strengths, weaknesses, opportunities, and prominent challenges faced when implementing Big Data technology in the telecommunications industry. Additionally, a case study on Djazzy Telecommunications Company is included. Big Data technology holds immense potential in driving future developments in the telecommunications sector. This necessitates that companies operating in this industry invest in the requisite infrastructure and skilled human resources to fully leverage the benefits of this cutting-edge technology.

In today's data-driven landscape, Big Data technology plays a pivotal role in enhancing customer understanding, improving service quality and efficiency, and fostering innovation across various sectors, including telecommunications. However, its implementation also presents challenges related to robust infrastructure requirements, data security and privacy concerns, and the need for specialized expertise. By proactively addressing these challenges and capitalizing on the opportunities presented by Big Data, telecommunications companies can gain a competitive edge and better serve their customers' evolving needs.

2.Theory and Hypotheses

2.1 Enhance decision making

Decision-making is the core of the administrative process and the success of institutions and government sectors. The decision-making process begins with data collection, processing, and extracting the information upon which decisions are made. Large organizations rely on analyzing massive and complex data using specialized software in data management and analytics. (Daifallah, 2016)

The decisions made are influenced by several factors related to data, such as its availability, accuracy, validity, and the employees' ability to handle it (Arrabah, 2018). Decision-makers need data that is relevant to the subject, accurate, and timely (Power, 2016). The value of data increases with managers' confidence in it and its impact on making sound decisions. Data quality is the fundamental factor in changing decisions, as additional and clear data provides the ability to differentiate one decision from another , We propose the following hypothesis:

- *H1: The utilization of big data technologies in the telecommunications sector leads to the enhancement of the decision-making process, as these technologies provide accurate and timely information to assist in making more informed decisions.*

2.2 Big data technologies and market analysis

In recent years, information systems have become one of the most important tools relied upon by those involved in marketing. It is an effective tool in the field of marketing to assist in speeding up decision-making and addressing various marketing problems (Magdy, 2014). The marketing decision must emanate from a complete assessment of the internal and external environmental variables of the organization, and this assessment is fundamentally based on the information provided by the marketing information system (ben yakoub & Kebab, 2019).

Furthermore, the management information system will be an interactive structure through equipment and control methods designed to create a flow of substantial information, according to a database that assists in the marketing decision-making process. The need for this system increases with rapid development and new technologies (Borba, 2014). Due to the rapid development and entry into the world of the internet and virtual communities, studying online behavior has become both an opportunity and a necessity, by observing behavior in the natural environment. Therefore, an in-depth study is required, where the researcher needs to acquire extensive knowledge about the group of individuals and observe them for extended periods to gain a good understanding and accurate analysis of behavior, by understanding the commonalities among individuals and their various inclinations (Dadiumadevi, 2018)

- *H2: Big data technologies enable telecommunications companies to better analyze their markets, by understanding customer trends and preferences more deeply, which helps determine target market segments more accurately.*

2.3 The use of basic data techniques is preferable to simplify and rationalize internal processes

identify the benefits and risks of big data technologies, and the adoption of these technologies in companies. It sought to assist managers in understanding the key strategic and informational benefits and risks associated with using big data technologies, as well as the impact of investments in these data on companies' operations and strategies (Reguseo & Vitari, 2018).

Telecommunications companies have huge amounts of data constantly flowing from customers, networks and internal operations. Using big data analysis techniques, these companies can discover new patterns and insights within this data to identify weaknesses and bottlenecks in existing processes (Smith, 2021). leading telecommunications companies are using big data technologies to streamline processes and achieve new innovations. They present a case study of a major telecommunications company that used advanced analytics to identify and eliminate bottlenecks and unnecessary steps in their processes (Rodriguez & Johnson, 2019).

- H3: The use of big data technologies in the telecommunications sector helps to simplify and rationalize internal processes, by identifying weak points and bottlenecks, and thus improving the efficiency of these processes.*

2.4 Innovation and Business Opportunities Hypothesis

telecommunications companies use big data analytics to discover and anticipate new customer needs and trends (Reynolds, 2022). telecommunications companies can leverage big data to uncover new markets and growth opportunities by analyzing consumer data and broad market trends (Lee & Thompson, 2020). a major telecommunications company uses techniques like machine learning and big data analytics to analyze network and customer data to discover opportunities for new services such as mobile internet and online video services (Capturing Value from Big Data in Telecommunications, 2021).

- *H4: Big data analysis can help telecom companies discover new business opportunities, such as developing innovative products or services, or entering new markets.*

2.5 Legal and Security Challenges Hypothesis

the legal and regulatory challenges faced by telecommunications companies regarding protecting customer data and privacy amidst the increasing use of big data technologies (Miller, 2022). The issues and risks in protecting customer information in telecom companies that are imposed by other organizations or companies that do not operate in different ways and without customer satisfaction are reduced (Wood & Lee, 2021). the different legislations and laws related to the use of big data in European Union countries and proposes a unified regulatory framework to address legal gaps (Harrison, 2020)

- *H5: The use of big data technologies in the telecommunications sector entails legal and security challenges, such as protecting data privacy and ensuring its security, which requires establishing an appropriate regulatory and legal framework.*

3.Data Description and Methodology

3.1 Data Description

The topic deals with applications of big data technology in the telecommunications sector. It focuses on studying the benefits and risks associated with the use of these technologies in this sector. Data related to the topic includes:

Information about big data technologies used in the telecommunications sector, such as types of software and analytical tools, Statements about the potential benefits of using big data technologies in this sector, such as improving decision-making, market analysis, discovering business opportunities, and streamlining operations. Information about the challenges and risks associated with the use of these technologies, especially regarding legal and security aspects such as data protection and customer privacy. Case studies and examples of telecommunications companies using big data technologies, showing how they are applied and their impact on operations and strategies. Opinions and recommendations of experts and researchers about best practices and how to make the most of these technologies in the communications sector.

3.2 The theoretical aspect

The two researchers conducted a survey of intellectual production on the subject of the study in the most important bibliographic tools in Arabic and English, represented by a number of databases specialized in the field of the subject of the study.

3.3 The applied aspect

The study relied on the descriptive approach, by studying the case of the telecommunications sector's application of big data technology, and studying, analyzing, describing and observing the current situation through the use of the SWOT analysis tool, which is a tool that helps to identify the strengths, weaknesses, opportunities and threats in the subject of the current study. Data and information were collected through a group of studies and research that dealt with the topic in Arab and foreign intellectual production.

4. Big data technology

4.1 The concept of big data

Before defining Big Data, we refer to the concept of data. Data is defined as the raw form of information before sorting, organizing, and processing operations, and it cannot be utilized in its initial form before processing. Raw data can be divided into three types (Habash, , 2013):

- *Structured data:* Data organized in tables or databases in preparation for processing.
- *Unstructured data:* Data generated daily by individuals, such as text writings, images, videos, messages, clicks on internet sites, etc. This constitutes the largest proportion of data.

- *Semi-structured data*: Considered a type of structured data, but the data is not designed in tables or databases.

Big Data is defined as a collection of extremely large and complex datasets to the extent that it becomes difficult to process using only one database management tool or traditional data processing applications. Challenges include duration, storage, search, sharing, transfer, analysis, and visualization (Vance, 2022). The Big Data Institute defined it as "any dataset that is beyond the capacity of traditional database tools to capture, store, manage, and analyze" (McKinsey & Company, 2011).

In 2012, Gartner updated its definition to "Big Data is high-volume, high-velocity, and/or high-variety information assets that require new forms of processing to enable enhanced decision making, insight discovery, and process optimization" (Beyer, 2012).

The International Organization for Standardization (ISO) defines it as "a dataset(s) with characteristics (e.g., volume, velocity, variety, variability, veracity, etc.) that for a particular problem domain at a given point in time cannot be efficiently processed using current/existing/established/traditional technologies and techniques in order to extract value (Douglas, 2012).

Ghonim (2021) indicated that Big Data was named as such because it is characterized by large volume and high degree of variety, generated at high velocity and requires high-speed processing, in addition to being highly inaccurate and complex, which exceeds the capacity of traditional information systems (in terms of storage and operation) to handle this data.

We can conclude from the previous definitions that Big Data is data resulting from our intensive use of multiple electronic devices, internet tools and applications, and mobile phones to conduct many operations related to daily life practices (such as making calls, sending messages, tweets, or files of various types, or completing purchasing processes) and other multiple practices and activities. All these uses constitute increasing digital data that formed Big Data, which is difficult to manage and analyze with database management systems. Therefore, it relies on multiple algorithms of artificial intelligence with tremendous capabilities to reach new and innovative information that helps in decision-making or problem-solving.

4.2 Importance of Big Data

Big data holds high importance for various business sectors as it helps them survive and achieve competitive advantages to attract new beneficiaries, thus increasing their profits and services. This is because big data provides deeper insights into deducing some unclear patterns and practices that constitute an important factor in understanding customer requirements and making effective decisions.

For example, using big data analysis tools, Walmart was able to improve its online product search results by 10-15%. Additionally, a report by McKinsey (2011) - a leading business consulting firm - stated that if the healthcare sector in the United States effectively and efficiently used big data analysis techniques, it could have saved more than \$300 billion annually from the health budget (two-thirds of the budget) due to an 8% reduction in spending costs. According to a previous survey conducted by Gartner, 64% of companies and organizations invested in adopting new technologies to deal with big data in 2013. The benefits of big data are not limited to commercial institutions and projects but extend to many other fields including energy, education, health, and large scientific projects (Prashad, 2011).

Big data is considered the new era of computing that helps achieve added value through data scanning and processing. The data produced by users has grown increasingly over time for several reasons, including buyer data across all sectors and applications. With the rapid and advanced

development of technologies and devices connected to the Internet (Internet of Things), they will contribute to increasing the amount of data produced (Hadi, Shnain, Hadishahee, & Ahmad, 2014).

4.3 Types of Big Data

Big data comes in several types, and among the most important are:

The First Type: Small pieces of 'silent' data - such as numbers or facts - which Alex 'Sandy' Pentland described as "digital breadcrumbs." Examples of this include call detail records collected by mobile companies (see Table 1) (Bouillet, et al., 2012).

Table 1: Phone call log data

Variable	data
Caller ID	hj7xq293fnn
Location of the tower closest to the caller	36°42'52, N 3°13'23
Phone number of the call recipient	qsdf7890azxy
Location of the tower closest to the call recipient	26°30'47, N 3°31'12
Call duration	01:03 :12

Telephone call records are considered data descriptors that document users' utilization of their mobile phones, including details such as: identification verification code, cell tower location, and call duration. Telecommunications companies maintain these call records on a daily basis.

Figure 1: Global mobile data traffic forecast by ITU

Overall mobile data traffic is estimated to grow at an annual rate of around 55% in 2020-2030 to reach 607 exabytes (EB) in 2025 and 5, 016 EB in 2030. (cisco, 2020)



Type Two: This encompasses data exchanged through social media networks, such as video files, messages, documents, tweets, and other content from social media applications. The majority of this data is unstructured, which complicates its analysis.

Type Three: This category of big data is collected remotely through digital sensors, such as smart devices installed in homes to record electricity consumption, or satellite imagery capable of capturing physical information—like vegetation cover—as an indicator of deforestation. (Prashad, 2011)

Type Four: Some researchers include additional data in the big data classification, such as price and purchase data, climate data, or digital information sources.

5. Telecommunications sector

The importance of the telecommunications and information technology sector is highlighted by its role as a primary source of increased domestic income in developed countries. This sector encompasses production processes with high economic added value and advanced technical procedures, making it a strategic and vital sector in most countries. This has conferred a significant advantage due to the continuous growth of Internet applications (mcit.gov.Saudi Arabia, 2023).

5.1 Reasons for Utilizing Big Data Technology in the Telecommunications Sector

Several factors have prompted telecommunications companies to adopt big data technology as an alternative to traditional databases, most notably the following (InfoCepts, 2022):

- Data in conventional databases are fragmented and inconsistent.
- Subdata require numerous manual adjustments to meet expected data quality standards.
- Data inflation coupled with a lack of computational capacity to process and handle this massive data expansion.
- Inability to consistently meet service quality levels.
- Insufficient data leading to reduced search and retrieval capabilities from the database and inaccuracies in effective decision-making.
- The system in use is either not scalable or insufficiently flexible.
- The need for assistance in adapting to evolving customer needs.
- The requirement to provide multiple high-quality reports by relying on accurate data analysis and prediction.
- The need to abbreviate and reduce the time required for report generation.

5.2 Prominent Applications of Big Data Technology in the Telecommunications Sector

Telecommunications companies collect vast amounts of data from call detail records, mobile phone usage, network equipment, server logs, billing, social networks, providing substantial information about their customers and networks. Most telecommunications use cases fall into these main categories:

- Geolocation.
- Customer acquisition and retention through predictive analytics.
- Network service improvement.
- External investments.

These applications will be elucidated under two main domains (geolocation and predictive analytics) as follows:

5.2.1 First Domain: Geolocation

Geolocation is an integral part of big data analysis efforts that help enhance the value and quality of operational outcomes and services provided by telecommunications companies, as illustrated in Figure 2. The following are some examples of big data usage in geolocation:

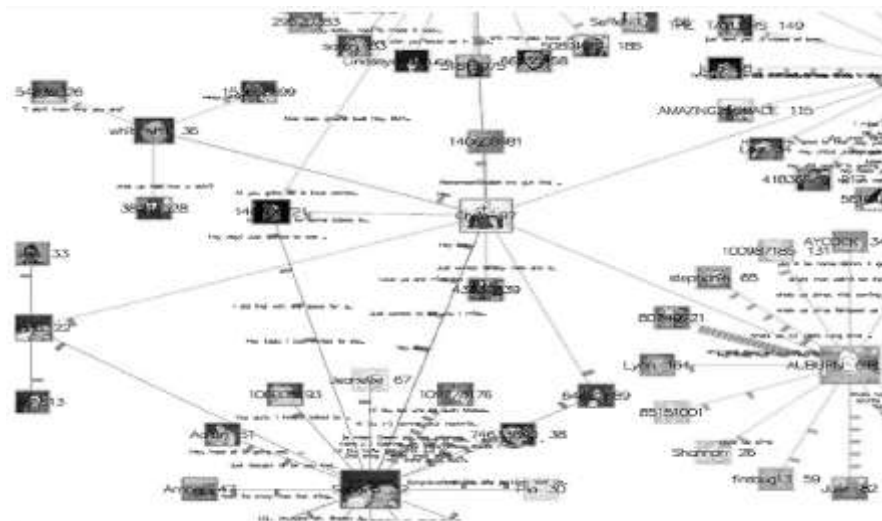
- A. Identifying locations without 4G service: Investment in 4G networks and developing new mobile applications for businesses requires developing a deeper vision of customer usage,

transactions, and behaviors. One of the means that aids in increasing company revenues (Blumenstock, Eagle, & Fafchamps, 2016):

- Identifying areas with high bandwidth availability but low levels of 4G-compatible devices.
- Identifying regions still lacking 4G services but with a large number of 4G-compatible devices.

Between these two scenarios, service providers can, through big data, integrate network spectrum coverage analysis with call records (voice and data), subscriber reservation data, and roaming data, then conduct polarization site analysis for 4G services and make effective decisions to provide the service.

Figure 2: Network analysis in positioning



- Geolocation assists marketers and brand managers in planning and executing mobile advertising campaigns for actual beneficiaries of products or services. This is achieved after identifying the locations of beneficiaries and analyzing their needs, thereby enabling them to understand where customers interact with advertisements. Subsequently, advertising campaigns are planned based on the analysis of locations of beneficiaries who interacted with previous advertising campaigns.
- Geolocation assists the telecommunications company Djezzy in identifying areas with stronger and weaker 4G and 3G internet connectivity, as illustrated in Figure 3.

Figure 3: Geolocation helps Djezzy map 4G and 3G signal strengths



D. Detecting vulnerabilities and issues in customer service delivery, for example (McDonald, 2020):

When a decrease in network subscription is observed, sales, marketing, and customer service departments should locate affected customers and implement efforts to address this issue immediately.

When a customer suddenly abandons their shopping cart, customer service representatives can alleviate concerns and resolve the issue through a call, text message, or subsequent email. For instance, in 2010, the automobile company Advocate began working with New Star to obtain customers' geolocation data, which helped them deliver customized advertisements to mobile phone users who were near the advertiser's car showrooms.

Data related to mobile financial transfers during the 2008 earthquake in Rwanda were utilized to analyze the timing, amount, and reasons for donations to affected areas, which helped reveal that wealthy individuals benefited more from the transfers.

Telephone call record data were used to understand the causes of infectious disease spread in urban areas of Kenya.

Telephone call records were utilized to predict economic and social levels. For example, average call volume data were compared with income levels to derive important indicators.

E. Mobile phone geolocation data for travel statistics purposes: Geolocation services can be used to understand domestic and international travel movements, thus aiding in making effective decisions to improve service levels in countries that are tourist destinations for travelers. For example, the Central Bank of Estonia used international travel statistics to determine imports and exports of inbound and outbound travel services in the current account of payments. Through mobile phone geolocation, travelers' places of residence were identified by leveraging the roaming service on mobile phones. (InfoCepts, 2022)

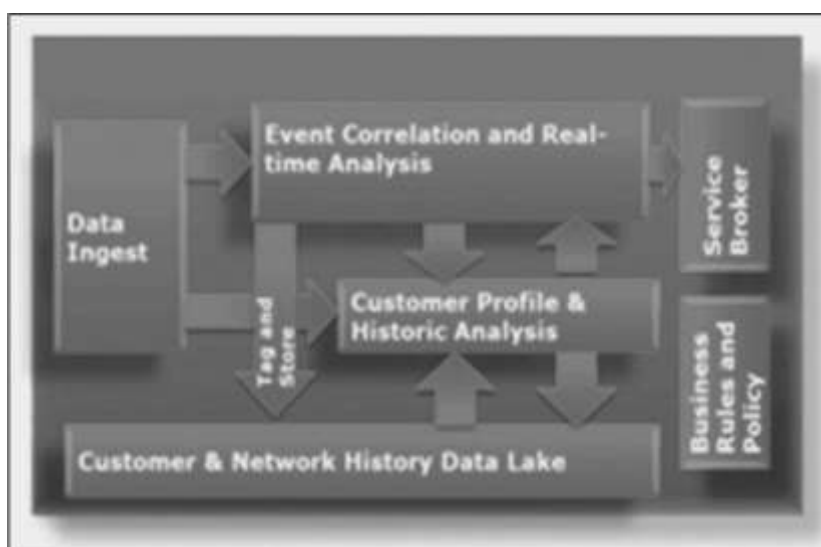
2.2.4 The second field/predictive analytics

Predictive analytics derived from big data aids in effective decision-making and problem-solving, which can be utilized in the following scenarios (Blumenstock, Eagle, & Fafchamps, 2016), as illustrated in Figure 4:

1. When customers switch their subscription from one network to another in search of better deals—one of the biggest challenges facing telecommunications companies, as acquiring new customers is highly costly—telecom companies must understand the reasons for this churn. Common reasons include high prices, poor service, low call quality, outdated technology, or attractive offers from competitors. To prevent this churn and migration to rival companies, telecom providers leverage real-time and predictive analytics through big data technology to:
 - Combine variables (such as calls made, minutes used, number of texts sent, and average bill amount) to predict the likelihood of churn.
 - Identify when a customer visits a competitor's website.
 - Analyze customer sentiments and opinions through their comments on social media to detect changes in perception.
 - Target specific customer segments with customized promotional offers based on past behavior.
2. Analyze call data records to identify fraudulent behaviors such as hacking and call bypassing.
3. Analyze patterns of customer behavior and use them to develop new products and services tailored to current and future customer needs, and generate ideas for brand improvement.

4. Big data can find new revenue sources, such as selling customer data to third parties like government organizations or commercial companies, for the purpose of sending messages about products or services that match each customer's needs according to the data acquired from telecom companies.
5. Predict periods of high network usage and target measures to alleviate network congestion and pressure.
6. Identify customers most likely to cause network disruptions or breaches and determine steps to prevent these breaches.
7. Identify customers most likely to have issues with bill payment and determine steps to improve payment recovery.

Figure 4: Main functions and uses of big data (Blumenstock, Eagle, & Fafchamps, 2016)



5.3 Key Components for Big Data Application in the Telecommunications Sector

To apply big data in the telecommunications sector, the following key components must be provided (Douglas, 2012):

- Establishing a correct big data strategy: Clearly defined strategies begin with understanding how big data can achieve significant performance gains.
- Adopting a comprehensive ecosystem approach: To ensure the effective operation of big data environments, the big data work environment must align with the business or company objectives and serve the unique needs of users.
- People and teams: The success of big data is linked to organizational culture by preparing employees to accept and train on the technology, not just providing and imposing it on them.

5.4 Requirements for Big Data Strategy

Creating an appropriate and effective big data strategy depends on the organization's mission and its general and specific strategic agenda. When developing a big data strategy, it should include the following axes (InfoCepts, 2022):

- Accelerating innovation and thus achieving competitive advantage.

- Anticipating seasonal demand trends by the organization's customers.
- Accurately identifying the consumer segment expected to generate consistent financial profit for the organization.
- Discovering the most productive supply chain partners.
- The ability to detect unnecessary overhead costs.

5.6 Characteristics of an Effective Big Data Strategy

(Blumenstock, Eagle, & Fafchamps, 2016) study indicated that for a big data strategy to achieve the required effectiveness, it must have the following characteristics and qualities:

Comprehensiveness: To lay the foundations for long-term success, companies need a big vision that addresses the many different components of an effective ecosystem (including well-designed architecture and robust big data tools), as well as the various dimensions through which big data can deliver value. For example, one of the most effective big data techniques is linking disparate datasets with internal and external data streams or information from different company functions to find new meaningful patterns and discover interrelationships.

Focus: There must be a focus on business relevant to specific commercial problems, as well as a focus on market opportunities or use cases, which are the basis for quantifying future business cases. Strategic planning for big data should be business-based; in other words, big data is not a scientific project but should focus on filling real-world business needs.

Flexibility: Big data must consider future uses, and strategies should avoid common constraints such as over-reliance on specific technologies or partners. Strategies should also consider creating added value and the overall developmental process.

5.7 Types of Data Obtainable Through Big Data

Telecommunications companies can obtain various data and information through big data technology, including (Douglas, 2012):

Customer behavior patterns, which can be identified by analyzing the following data:

- Voice, SMS, and data usage patterns.
- Video choices.
- Customer service history.
- Social media activity.
- Previous purchasing patterns.
- Website visits, browsing duration, and search patterns.

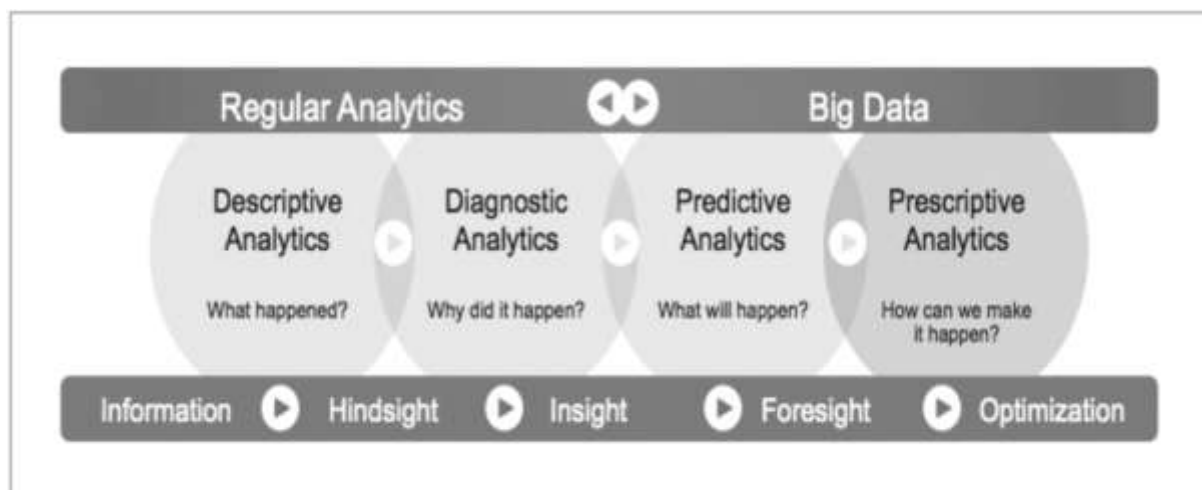
Demographic characteristics of customers, which include the following data:

- Age, address, and gender.
- Type and number of devices used.
- Service usage.
- Geographic location.

This allows telecommunications companies to provide personalized services or products at every stage of the purchasing process. Companies can also customize messages to appear on appropriate channels (e.g., mobile, internet, call centers, or in stores). Figure 5 illustrates the analytical steps performed in big data.

These efforts do not stop at the point of sale. As Pravin Thakur, Vice President of the Technology Business Unit, Association of Southeast Asian Nations, and Oracle, noted in a 2013 article, big data helps telecommunications track customer experiences throughout the relationship period and understand vendor behavior and interaction post-purchase (McDonald, 2020)

Figure 5: Steps for systematic analysis of big data



6. An illustrative model for the use of big data technology in the telecommunications sector, Djeezy Telecom Company, Algeria

A brief summary of Djeezy, a leading company in the field of mobile communications, is presented and an introduction to it and how it works, as follows:

6.1 Introduction to the company

The Algerian mobile phone operator "Djeezy" was established in July 2001.

A leader in the field of mobile telecommunications with over 14 million subscribers as of August 2022, Djeezy offers a wide range of services including postpaid plans, prepaid options, data services, as well as value-added services and SUT (Seemingly Unlimited Talk).

Since July 2022, when "VEON" divested its entire stake in the company to the National Investment Fund, Djeezy has become a national enterprise. It is currently owned 96.57% by the National Investment Fund and 3.43% by Cevital. Thus, Djeezy's management is now entirely conducted by Algerian shareholders:

The National Investment Fund (FNI) at 96.57% and Cevital at 3.43%.

Djeezy's network covers 95% of the population across the entire national territory, and its 3G services are available in 58 wilayas (provinces). Djeezy also launched 4G services on October 1, 2016, across 20 wilayas and has committed to nationwide coverage. (djezy, 2024)

6.2 Data collection methodology and the validity and reliability of the measurement instrument

A questionnaire was employed for the purpose of data collection, utilizing a five-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree). The questionnaire consisted of six sections:

- *Section One: General information.*
- *Section Two (H1): Decision Making Process.*
- *Section Three (H2) : Market Analysis.*
- *Section Four(H3): Simplifying internal processes.*
- *Section Five(H4): Discovering new business opportunities.*
- *Section Six(H5): Legal and Security Challenges .*

The Alpha Crotbach test was used to determine the stability of the instrument, and the results are shown in Table Number (1).

Table (1): Results of the reliability test of the study instrument

Phrases	Number of phrases	Stability coefficient value
All questionnaire statements	20	0.853

Source: was prepared by the researchers based on the outputs of the statistics program(spss25)

The test results showed that the Cronbach's alpha coefficient is 0.853, and this value is considered good, which reflects the stability of the tool used and the credibility of the results obtained from the questionnaire. The following is a description of the study sample:

The study sample consisted of 57 employees working in the telecommunications sector in Algeria, selected using stratified random sampling to ensure representation of various administrative and functional levels. The sample included employees from a major telecommunications company in the country.

The sample was distributed by gender as 65% male and 35% female, with ages ranging from 25 to 55 years, and a mean age of 38 years. In terms of educational level, 75% of participants held university degrees (bachelor's or higher), while 25% held technical certificates or diplomas.

According to job positions, the sample was distributed as follows:

- 10% from senior management
- 25% from project management and product development
- 20% from the information technology and networks department
- 15% from customer service and sales
- 15% from marketing and data analysis
- 15% from other departments (human resources, finance, legal)

Participants' years of experience ranged from 2 to 20 years, with an average of 8.5 years in the telecommunications sector. All participants had direct or indirect experience with big data projects within their organizations.

The questionnaire was sent to 150 employees, of whom 57 responded, resulting in a response rate of 38%. All received questionnaires were valid for analysis.

Geographically, participants were distributed across five major provinces in Algeria, with 60% concentrated in the capital, Algiers, and 40% distributed across the other provinces.

The sample selection took into account the representation of various administrative levels and job specializations to ensure comprehensive insights into the use and impact of big data technologies in Algeria's telecommunications sector. However, it is acknowledged that the sample size remains relatively small, which may limit the generalizability of the results.

It is suggested that the study may serve as an exploratory study, providing a foundation for future, more comprehensive research.

6.3 Presenting the questionnaire results and testing hypotheses

6.3.1. Attitudes of sample participants toward statements regarding the Decision-Making Process

Table (2): Attitudes of sample participants toward statements regarding the Decision-Making Process

Item	Mean	Standard Deviation	Relative Weight (%)
Big data technologies have contributed to providing more accurate information for decision-making.	3.96	0.24	79
The decision-making process has become faster after implementing big data technologies.	3.90	0.21	75
Managers' confidence in decisions based on big data analytics has increased	3.95	0.23	77
The error rate in strategic decisions has decreased after relying on big data	3.88	0.20	73
Σ	3.92	0.22	76

Source: was prepared by the researchers based on the outputs of the statistics program(spss25)

We observed from Table (2), The arithmetic mean (3.92) is close to 4 ("agree"), indicating that most participants agree with the statements related to the impact of big data technologies on the decision-making process.

1. The standard deviation (0.22) is relatively low, suggesting high homogeneity in opinions and clustered responses around the mean.

2. The relative weight (76%) indicates a high level of agreement with the statements. Typically, relative weights are interpreted as follows:

- Below 50%: Weak
- 50% - 65%: Moderate
- 66% - 80%: Good
- Above 80%: Excellent

In this case, the relative weight of 76% falls within the "Good" range, signifying that participants view positively the impact of big data technologies on:

- Providing more accurate information for decision-making.
- Accelerating the decision-making process.
- Increasing managers' confidence in the decisions made.
- Reducing the error rate in strategic decisions.

To calculate the standard deviation, we first computed the sum of squared deviations from the mean:

For the value 4 (agree): $(4 - 3.95)^2 \times 54 \approx 0.0025 \times 54 = 0.135$

For the value 3 (neutral): $(3 - 3.95)^2 \times 3 \approx 0.9025 \times 3 = 2.7075$

The sum of squared deviations = $0.135 + 2.7075 = 2.8425$

The standard deviation is the square root of (the sum of squared deviations divided by (the number of respondents minus 1)): $\sqrt{(2.8425 \div 56)} \approx \sqrt{0.0507} \approx 0.23$

It took until the results represent the opinions of the study participants and cannot be present absolutely in all telecommunications companies.

6.3.2 Attitudes of sample participants toward Simplifying internal processes

Table (3): statements regarding Market Analysis

Item	Mean	Standard Deviation	Relative Weight (%)
Djeezy successfully leveraged big data to better understand customer needs and trends	3.30	0.989	66
Big data assisted the company in discovering new market opportunities and identifying target markets with greater precision	3.38	0.987	67.6
The utilization of big data enhanced Djeezy's ability to forecast service demand and develop more effective pricing and marketing strategies	3.50	0.994	70
Djeezy effectively employed big data to comprehensively analyze competitors and the competitive landscape	3.42	0.991	68.4
Σ	3.40	0.990	68

Source: was prepared by the researchers based on the outputs of the statistics program(spss25)

The mean values indicate that all the statements achieved a positive degree of agreement, ranging from 3.30 to 3.50 on the five-point Likert scale. The statement "The utilization of big data enhanced Djeezy's ability to forecast service demand and develop more effective pricing and marketing strategies" received the highest mean of 3.50, suggesting that the use of big data greatly assisted Djeezy in forecasting service demand and developing more effective pricing and marketing strategies. All standard deviation values are around 1.0, indicating a moderate dispersion in the responses around the means. The relative weights ranged from 66% to 70%, meaning that the majority of respondents agreed with the statements to varying degrees. Overall, it appears that Djeezy successfully leveraged big data in various areas, including understanding customer needs, discovering new market opportunities, forecasting demand, and analyzing competitors and the competitive landscape.

6.3.3 Attitudes of sample participants toward statements regarding Market Analysis

Table (4): statements regarding Market Analysis

Item	Mean	Standard Deviation	Relative Weight (%)
Djeezy utilized big data analytics to streamline and optimize its internal business processes	3.76	0.980	75.2
the company leveraged big data insights to identify bottlenecks and inefficiencies in its operations	3.78	0.910	75.6
the adoption of big data technologies by Djeezy led to improved coordination and integration among different departments and business units	3.76	0.893	75.2
the use of big data impacted Djeezy's ability to automate routine tasks and reduce manual intervention in internal processes	3.77	0.915	75.4
Σ	3.67	0.924	75.35

Source: was prepared by the researchers based on the outputs of the statistics program(spss25)

The table (4) presents the attitudes of the sample participants toward statements regarding the utilization of big data for simplifying internal processes at Djazzy. The mean values for all four statements range from 3.76 to 3.78, indicating a high level of agreement among the respondents. The relative weights also reinforce this observation, with all statements achieving around 75% agreement.

The highest mean of 3.78 corresponds to the statement that the company leveraged big data insights to identify bottlenecks and inefficiencies in its operations, suggesting a strong perception that big data analytics played a crucial role in process optimization and identifying areas for improvement.

Furthermore, the low standard deviation values, ranging from 0.893 to 0.980, demonstrate a relatively low dispersion in the responses, implying a consistent level of agreement among the participants regarding the positive impact of big data on simplifying internal processes at Djazzy.

Overall, the data in the table indicates that the sample participants overwhelmingly agreed that Djazzy effectively utilized big data analytics to streamline its internal business processes, identify inefficiencies, improve cross-departmental coordination, and automate routine tasks, thereby simplifying and enhancing its internal operations.

6.3.4 Attitudes of sample participants toward Discovering new business opportunities

Table (5): Discovering new business opportunities

Item	Mean	Standard Deviation	Relative Weight (%)
Djazzy's utilization of big data analytics enabled the identification of untapped market segments or new customer groups	3.30	0.987	66
the company been able to leverage big data insights to develop innovative products or services that cater to emerging market trends	3.38	0.994	70
In your opinion, has the analysis of big data facilitated Djazzy's ability to explore new revenue streams or business models	3.50	0.991	68.4
the adoption of big data technologies by Djazzy enhanced its capability to anticipate and respond to changes in customer preferences and market dynamics	3.42	0.925	67.6
Σ	3.40	0.974	68

Source: was prepared by the researchers based on the outputs of the statistics program(spss25)

An analysis of the data presented in Table (5) regarding Djazzy's use of big data for discovering new business opportunities reveals generally positive perceptions among respondents. The overall mean score of 3.40 (out of 5) and an average relative weight of 68% suggest a moderate to strong agreement with the statements provided.

The highest mean score (3.50) was associated with the statement regarding big data's facilitation of exploring new revenue streams or business models, indicating that respondents perceive this as the most significant impact of big data analytics on Djazzy's business opportunity discovery. Conversely, the identification of untapped market segments or new customer groups received the lowest mean score (3.30), though still indicating a positive perception.

Standard deviations across all items are relatively consistent, ranging from 0.925 to 0.994, suggesting a moderate level of consensus among respondents. The overall standard deviation of 0.974 further supports this observation of consistent responses.

In terms of relative weight, the development of innovative products or services catering to emerging market trends scored highest at 70%, while the identification of untapped market segments scored lowest at 66%. This suggests that respondents perceive Djazzy as more effective in leveraging big data for product innovation than for market segment identification.

Overall, these results indicate that Djeezy's employees generally perceive the company's use of big data analytics as beneficial for discovering new business opportunities, with particular strengths in exploring new revenue streams and developing innovative products or services.

6.3.5 Attitudes of sample participants toward Legal and Security Challenges

Table (6): Legal and Security Challenges

Item	Mean	Standard Deviation	Relative Weight (%)
Djeezy has implemented adequate measures to protect customer data privacy in its big data analytics practices	3.60	0.808	72
Djeezy's effectiveness in addressing potential security vulnerabilities associated with the collection, storage, and processing of large volumes of data	3.54	0.930	70.8
Djeezy's compliance with national and international data protection regulations in its big data initiatives	3.58	0.835	71.6
The extent to which Djeezy has established clear policies and procedures for ethical data usage and management in its big data analytics operations.	3.62	0.902	72.4
Σ	3.58	0.868	71.7

Source: was prepared by the researchers based on the outputs of the statistics program(spss25)

An analysis of Table (6) regarding Legal and Security Challenges in Djeezy's big data practices reveals generally positive perceptions among respondents. The overall mean score of 3.58 (on a presumed 5-point scale) and an average relative weight of 71.7% indicate a moderately strong agreement with the statements provided.

The highest mean score (3.62) was associated with the establishment of clear policies and procedures for ethical data usage and management in big data analytics operations. This suggests that respondents perceive Djeezy as having robust ethical guidelines in place. Conversely, the effectiveness in addressing potential security vulnerabilities received the lowest mean score (3.54), though still indicating a positive perception.

Standard deviations across all items range from 0.808 to 0.930, with an overall standard deviation of 0.868. This suggests a moderate level of consensus among respondents, with opinions being relatively consistent across the surveyed population.

In terms of relative weight, the establishment of clear policies and procedures for ethical data usage scored highest at 72.4%, while addressing potential security vulnerabilities scored lowest at 70.8%. This implies that while all aspects are perceived positively, respondents view Djeezy's ethical data management slightly more favorably than its handling of security vulnerabilities.

Overall, these results indicate that Djeezy's employees generally perceive the company's approach to legal and security challenges in big data analytics positively. The company appears to be particularly strong in establishing ethical data usage policies and protecting customer data privacy. However, there may be room for improvement in addressing security vulnerabilities associated with large-volume data management.

6.4 Hypothesis testing

6.4.1 Testing the first sub-hypothesis

H0: The utilization of big data technologies in the telecommunications sector does not lead to the enhancement of the decision-making process by providing accurate and timely information to assist in making more informed decisions.

H1: The utilization of big data technologies in the telecommunications sector leads to the enhancement of the decision-making process by providing accurate and timely information to assist in making more informed decisions.

To test this hypothesis using Pearson's correlation coefficient:

1. Collect data on two variables:
 - Variable X: Measure of big data technology utilization
 - Variable Y: Measure of decision-making process enhancement

Table (7): Pearson Correlation Coefficient between Big Data Technology Utilization and Enhancement of Decision-Making Process in the Telecommunications Sector

Independent variable: Big Data Technology Utilization	variables
** 919.0	Enhancement of Decision-Making Process
$p^{**} \leq 0.01$	N=50

Source: was prepared by the researchers based on the outputs of the statistics program(spss25)

The analysis of Table (7) reveals a strong positive correlation between Big Data Technology Utilization and Enhancement of Decision-Making Process in the Telecommunications Sector. The Pearson Correlation Coefficient of 0.919 indicates a robust, directly proportional relationship between these variables. This suggests that increased utilization of big data technology is strongly associated with improved decision-making processes.

The correlation is statistically significant at the 1% level ($p \leq 0.01$), providing compelling evidence against the null hypothesis of no correlation. The study, conducted with a sample size of 50, offers substantial support for the hypothesis that big data technology utilization significantly enhances decision-making in the telecommunications sector. However, it's crucial to note that while this strong correlation implies a close relationship, it does not necessarily prove causation. Other factors not considered in this analysis might also influence decision-making processes. Further research, potentially involving controlled experiments or longitudinal studies, could provide deeper insights into the causal nature of this relationship and its implications for the telecommunications industry.

6.4.2 Testing the second sub-hypothesis

For the given hypothesis regarding big data technologies and market analysis in telecommunications companies, we can formulate the null (H_0) and alternative (H_1) hypotheses for Pearson's correlation test as follows:

H0: There is no significant correlation between the use of big data technologies and the ability of telecommunications companies to better analyze their markets, understand customer trends and preferences, and determine target market segments accurately.

H1: There is a significant positive correlation between the use of big data technologies and the ability of telecommunications companies to better analyze their markets, understand customer trends and preferences, and determine target market segments accurately.

In statistical notation, this can be expressed as:

$$H_0: \rho = 0 \quad H_1: \rho > 0$$

Where ρ (rho) represents the population correlation coefficient.

Table (8): Simple Linear Regression Analysis of the Impact of Big Data Technology Utilization on Market Analysis Capabilities in Telecommunications Companies

Variable	Beta	R	R ²	level
Market Analysis Capabilities	0.964	0.964	0.928	0.000

Source: was prepared by the researchers based on the outputs of the statistics program(spss25)

The analysis of Table (8) presents compelling evidence regarding the impact of Big Data Technology Utilization on Market Analysis Capabilities in Telecommunications Companies. The simple linear regression results reveal a strong positive relationship between these variables. The standardized regression coefficient (Beta) of 0.964 indicates a robust, positive influence of big data technology utilization on market analysis capabilities. This high Beta value suggests that for each standard deviation increase in big data technology utilization, there is a corresponding 0.964 standard deviation increase in market analysis capabilities.

The correlation coefficient (R) of 0.964 further corroborates this strong positive relationship. Moreover, the coefficient of determination (R²) of 0.928 is particularly noteworthy, indicating that approximately 92.8% of the variance in market analysis capabilities can be explained by the utilization of big data technologies. The significance level (p-value) of 0.000 demonstrates that these results are statistically significant at the 0.01 level, providing strong evidence against the null hypothesis. These findings collectively suggest that the adoption and utilization of big data technologies in telecommunications companies substantially enhance their ability to analyze markets, understand customer trends, and determine target market segments more accurately. However, while these results strongly support the hypothesis, it is important to consider potential confounding variables and the specific context of the telecommunications industry when interpreting these findings.

Table(9): Table: Simple Linear Regression Analysis of the Impact of Big Data Technology Utilization on Internal Process Simplification and Rationalization in Telecommunications Companies

variable	Beta	R	R ²	level
Internal Process Simplification and Rationalization	0.519	0.519	0.269	0.000

Source: was prepared by the researchers based on the outputs of the statistics program(spss25)

The Table (9) reveals significant insights into the impact of Big Data Technology Utilization on Internal Process Simplification and Rationalization in Telecommunications Companies. The results indicate a moderate positive relationship between these variables, with a standardized regression coefficient (Beta) of 0.519. This suggests that increased utilization of big data technologies is associated with improvements in internal process simplification and rationalization. The correlation coefficient (R) of 0.519 further corroborates this moderate positive relationship.

The coefficient of determination (R²) of 0.269 indicates that approximately 26.9% of the variance in internal process simplification and rationalization can be explained by the utilization of big data technologies. While this demonstrates a significant influence, it also suggests that other factors not included in this model play substantial roles in process improvement.

The significance level (p-value) of 0.000 provides strong statistical evidence for the relationship between the variables. These findings support the hypothesis that big data technologies contribute to the simplification and rationalization of internal processes in telecommunications companies. However, the moderate strength of the relationship implies that while big data technologies are an important factor, they are likely one of several elements influencing process efficiency. Telecommunications companies should therefore consider big data technologies as a valuable tool for process improvement, but should also explore complementary strategies to maximize efficiency gains in their internal operations.

Table (10): Simple Linear Regression Analysis of the Impact of Big Data Analysis on New Business Opportunity Discovery in Telecommunications Companies

variable	Beta	R	R ²	level
New Business Opportunity Discovery	0.918	0.918	0.845	0.000

Source: was prepared by the researchers based on the outputs of the statistics program(spss25)

The analysis of Table (10) presents compelling evidence regarding the impact of Big Data Analysis on New Business Opportunity Discovery in Telecommunications Companies. The simple linear regression results reveal a strong positive relationship between these variables.

The standardized regression coefficient (Beta) of 0.918 indicates a robust, positive influence of big data analysis on new business opportunity discovery. This high Beta value suggests that for each standard deviation increase in big data analysis utilization, there is a corresponding 0.918 standard deviation increase in the discovery of new business opportunities.

The correlation coefficient (R) of 0.918 further corroborates this strong positive relationship, indicating a high degree of association between big data analysis and the identification of new business prospects.

Moreover, the coefficient of determination (R²) of 0.845 is particularly noteworthy, indicating that approximately 84.5% of the variance in new business opportunity discovery can be explained by the utilization of big data analysis. This high R² value provides strong evidence for the predictive power of big data analysis in uncovering new business opportunities.

The significance level (p-value) of 0.000 demonstrates that these results are statistically significant at the 0.001 level, providing strong evidence against the null hypothesis and supporting the existence of a substantial relationship between the variables.

Table (11): Simple Linear Regression Analysis of the Impact of Big Data Technology Utilization on Legal and Security Challenges in Telecommunications Companies

variable	Beta	R	R ²	level
Legal and Security Challenges	0.815	0.815	0.514	0.000

Source: was prepared by the researchers based on the outputs of the statistics program(spss25)

The analysis of Table(11) provides significant insights into the relationship between Big Data Technology Utilization and Legal and Security Challenges in Telecommunications Companies. The simple linear regression results reveal a strong positive relationship between these variables.

The standardized regression coefficient (Beta) of 0.815 indicates a robust, positive influence of big data technology utilization on legal and security challenges. This high Beta value suggests that for each standard deviation increase in big data technology utilization, there is a corresponding 0.815 standard deviation increase in legal and security challenges faced by telecommunications companies.

The correlation coefficient (R) of 0.815 further corroborates this strong positive relationship, indicating a high degree of association between the use of big data technologies and the emergence of legal and security issues.

The coefficient of determination (R²) of 0.514 is notable, indicating that approximately 51.4% of the variance in legal and security challenges can be explained by the utilization of big data technologies. This R² value provides substantial evidence for the predictive power of big data technology utilization in relation to legal and security concerns.

The significance level (p-value) of 0.000 demonstrates that these results are statistically significant at the 0.001 level, providing strong evidence against the null hypothesis and supporting the existence of a substantial relationship between the variables.

These findings collectively suggest that the adoption and utilization of big data technologies in telecommunications companies is strongly associated with an increase in legal and security challenges, such as those related to data privacy protection and security assurance. The strong positive relationship indicated by these results supports the hypothesis that the use of big data technologies necessitates careful consideration of legal and security implications.

This analysis underscores the importance of establishing an appropriate regulatory and legal framework to address these challenges as telecommunications companies increasingly leverage big data technologies. While the relationship is strong, it's important to note that other factors not captured in this model may also contribute to legal and security challenges in the telecommunications sector.

In conclusion, these results emphasize the need for telecommunications companies to proactively address legal and security concerns as they expand their use of big data technologies, highlighting the importance of robust data governance practices and compliance with evolving regulatory requirements.

7. Conclusions and Future Research:

Based on the comprehensive analysis of big data utilization in Djezzy, a major telecommunications company in Algeria, several key conclusions can be drawn. First, big data technologies have significantly enhanced Djezzy's decision-making processes, providing accurate and timely information that enables more informed decisions across the organization. This technological adoption has greatly improved the company's ability to analyze markets, gaining deeper insights into customer trends and preferences, and allowing for more precise determination of target market segments.

Furthermore, the implementation of big data technologies has contributed substantially to the simplification and rationalization of internal processes. By identifying weak points and bottlenecks within the company's operations, Djezzy has been able to improve its overall efficiency, streamlining workflows and optimizing resource allocation.

Big data analysis has also proven to be a powerful tool for Djezzy in discovering new business opportunities. This has facilitated the development of innovative products and services, as well as identified potential avenues for market expansion, allowing the company to stay competitive and grow its market share.

However, the increased reliance on big data technologies has not been without challenges. There has been a corresponding rise in legal and security concerns, particularly in the areas of data privacy and security. As Djezzy collects and analyzes more customer data, it must navigate complex regulatory landscapes and implement robust security measures to protect sensitive information.

These conclusions highlight both the transformative potential of big data in the telecommunications industry and the need for careful management of its implementation and use. They underscore the importance of continued investment in data infrastructure, analytics capabilities, and security measures to fully leverage the benefits of big data while mitigating associated risks.

7.1 Recommendations:

To maintain and enhance its competitive edge in the Algerian telecommunications market, Djazzy should continue to invest in and upgrade its big data infrastructure. This investment should be complemented by comprehensive employee training programs to ensure that staff at all levels can effectively utilize big data tools and interpret the resulting insights. By leveraging big data insights, Djazzy can further personalize services and improve customer experience, thereby increasing customer loyalty and market share. The company should use big data analytics to drive innovation in product and service development, staying ahead of market trends and customer needs. Continued use of big data to identify and eliminate inefficiencies in internal processes, focusing on areas with the highest potential for improvement, is crucial for ongoing optimization.

To address the legal and security challenges associated with big data utilization, Djazzy should establish a robust data governance framework. This framework should include clear policies on data privacy, security protocols, and compliance with national and international regulations. The company should also consider partnerships with academic institutions or tech companies to stay at the forefront of big data technologies and applications in the telecommunications sector. Developing and adhering to strict ethical guidelines for data collection, analysis, and application is essential to maintain customer trust and comply with evolving regulations. Djazzy should enhance its use of predictive analytics to anticipate market changes, customer behavior, and potential network issues before they occur. Finally, encouraging cross-departmental collaboration in the use of big data insights will ensure a holistic approach to decision-making and strategy development.

By implementing these recommendations, Djazzy can harness big data to strengthen its market position, boost operational efficiency, and spur innovation in Algeria's telecom sector. However, balancing these advancements with strong security measures and ethical practices is crucial to maintain customer trust and ensure regulatory compliance.

7.2 Limitations and Future Research:

Here's a concise version:

While promising, Djazzy's big data utilization faces limitations, offering opportunities for future research. Key challenges include potential data bias and privacy concerns. Future studies should focus on developing sophisticated methods to minimize bias and ensure comprehensive customer representation. Additionally, research is needed to balance data utilization with privacy protection, possibly through advanced anonymization or blockchain technology, as data protection laws evolve. The complexity of big data systems poses a limitation in terms of interpretability. Future research could focus on developing more intuitive visualization tools and AI-powered systems that can explain their decision-making processes, making big data insights more accessible to non-technical stakeholders. There's also a need for longitudinal studies to assess the long-term impact of big data initiatives on company performance, customer satisfaction, and market dynamics. Such research could provide valuable insights into the sustained benefits and potential drawbacks of extensive data utilization in the telecommunications sector.

The rapidly evolving nature of technology presents another limitation, as current systems may quickly become obsolete. Future research should explore adaptive AI systems that can continuously learn and update their models based on new data and changing market conditions. Interdisciplinary research combining telecommunications expertise with data science, ethics, and law could yield valuable insights into creating more holistic and sustainable big data strategies. Studies on cross-cultural differences in data perception and usage could also be beneficial for companies operating in diverse markets. Lastly, research into the environmental impact of data centers and big data operations could lead to more sustainable practices in the industry. Future studies might explore energy-efficient algorithms and green computing solutions for big data analytics.

These areas of future research and addressing current limitations will be crucial in maximizing the potential of big data in the telecommunications industry while mitigating associated risks and challenges.

REFERENCES

- Arrabah, g. (2018). Data, meaning and role of supporting decision-making and planning: a descriptive study. *Annual conference The 14th and 20th century with specialized libraries, Arabic branch*, "data, value, prospects", (p. 14). Muscat.
- ben yakoub, A., & Kebab, M. (2019, 12 03). The role of the marketing information system in making strategic marketing decisions in economic institutions. *Encyclopedia of Islamic economics and finance*, p11. Consulté le 01 06, 2020.
- Beyer, M. (2012, November 25). Gartner Says Solving 'big data' challenge involves more than just managing volumes of data. (<https://www.gartner.com/newsroom/id/1731916>).
- Blumenstock, J., Eagle, N., & Fafchamps, M. (2016, 03 01). Airtime transfers and mobile communications: Evidence in the aftermath of natural disasters. *ournal of Development Economics*, P 120.
- Borba, A. (2014, 06). Big data usage in the marketing information system. *journal of data analysis and information processing*, p78. Consulté le 03 14, 2019.
- Bouillet, E., Kothari, R., Kumar, V., Mignet, L., Nathan, S., Ranganathan, A., . . . Verscheure, O. (2012). Processing 6 billion CDRs/day: from research to production (experience report). in *Proceedings of the 6th ACM International Conference on Distributed Event-Based Systems* (pp. PP 264-267). https://www.researchgate.net/publication/241770193_Experience_Report_Processing_6_Billion_CDRsDay_From_Research_to_Production (26/11/2022).
- Capturing Value from Big Data in Telecommunications. (2021). *Journal: Telecommunications Records*(05).
- cisco. (2020). *Global mobile data traffic forecast by ITU*. Source Interface Selection for Outgoing Traffic.
- Dadiumadevi. (2018, 02). Big data usage in the marketing information system. *journal of data analysis and information processing*, p30.
- Daifallah, K. (2016, 06 03). <https://www.linkedin.com/pulse/khaled-daiifallah/>. (W. T. Company, Éditeur) Consulté le 12 16, 2023.
- djeezy. (2024, 05 26). Consulté le 05 28, 2024, sur <https://www.djeezy.dz/>.
- Douglas, L. (2012, JUNE). The Importance of 'Big Data': A definition. GARTNER.
- Habash, , m. (2013, 07 24). <https://www.tech-wd.com/wd/2013/07/24/what-is-big-data/>. Consulté le 2022
- Hadi, H., Shnain, A., Hadishahee, S., & Ahmad, D. (2014). http://www.iraj.in/up_proc/pdf/110141576915829-36.pdf. Récupéré sur <http://www.iraj.in>.
- Harrison, E. (2020). The Regulatory Framework for Big Data in the Telecommunications. pp67-102.
- InfoCepts. (2022, 12 22). http://www.infocepts.com/pdf/Services/Data-Integration_and_Information_Management/Reengineering_a_Telecom_Market_Share_Analytical_Application.pdf (22/12/2022).
- Lee, R., & Thompson, S. (2020). Big Data Analytics as a Source of Competitive Advantage for Telecommunications Companies. pp 122-198.
- Magdy, M. (2014). *Effective e-marketing*. Alexandria, Egypt: Mahi Publishing and Distribution.
- McDonald, C. (2020, November). Big Data opportunities for telecommunications. (<https://developer.hpe.com/blog/big-data-opportunities-for-telecommunications/>).
- mcit.gov.Saudi Arabia. (2023). Consulté le 02 16, 2024, sur <https://www.mcit.gov.sa/en>.
- Mckinsey, & Company. (2011). Big Data: The next frontier for innovation, competition and productivity. u.s.a. Consulté le avril 05, 2024.
- Miller, J. (2022). Data Protection and Privacy in the Big Data Era: Challenges for the Telecommunications Sector. PP115-142.
- Power, D. (2016). Data science: supporting decision-making. *Journal of Decision systems*, 4(25), (pp. 345-356). Consulté le 02 17, 2024
- Prashad, L. (2011, NOVEMBER 28). Social impact through satellite remote sensing: Visualizing acute and chronic crises beyond the visible spectrum (UN Global Pulse). UN Global Pulse.
- Reguseo, E., & Vitari, C. (2018, January). Investments in big data analytics and firm performance. *International Journal of Production Research*, p26. doi: 10.1080/00207543.2018.1427900
- Reynolds, J. (2022). Big Data and Innovation in the Telecommunications Sector. *Journal of Advanced Telecommunication Technologies*, pp 47-63.
- Rodriguez, M., & Johnson, A. (2019). Big Data and Process Innovation: A Case Study in the Telecommunications Sector. *Journal of Information Technology and Innovation*, 17(02), pp 68-82.
- Smith, J. (2021). Improving Business Processes Using Big Data Analytics in the Telecommunications Sector. *Journal of Information Technology Management*, 32(4), p115-130.
- Vance, A. (2022, april 22). Start-Up Goes After Big Data with Hadoop Helper. <https://bits.blogs.nytimes.com/2010/04/22/start-up-goes-after-big-data-with-hadoop-helper/>. new york, U.S.A. Consulté le march 03, 2024
- Wood, S., & Lee, D. (2021). Managing Big Data Security Risks in Telecommunications. *Journal of Information Security and Networking*(03), pp28-39.

How to cite this article by the APA method:

Fares Gater, Allaeddine Zeroual, Toufik Hannachi, (2026). Big Data's Impact in Telecoms: Djeezy Algeria Case Study, .Roa Iktissadia Review, Algeria: University of El-Oued.16 (01), 65-88

The copyrights of all papers that were published in this journal are retained by the respective authors as per the [Creative Commons Attribution License](#).



Roa Iktissadia Review is licensed under a [Creative Commons Attribution-Non Commercial license \(CC BY-NC 4.0\)](#)