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Article

# The Use of Data in Improving the Customer Experience: A Field Study at K-Card Iraq

**Rasha Salih Mosleh*[1]**
1. Kirkuk General Directorate of Education, Iraq
*Correspondence: cade.2021.19@st.tu.edu.iq

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**Abstract:** The aim of this research was to determine the nature of the impact of big data on improving the customer experience at K-Card Digital Services. Using a descriptive-analytical approach, the research population comprised the general management of K-Card, with a sample of 80 employees whose views were surveyed using a questionnaire; the data were analysed using the SPSS V27 statistical package. The study concluded that there is a strong positive impact of big data on improving the customer experience at the company under study, Several recommendations were put forward, the most important of which was the need to provide organisational support to integrate the requirements of the transition towards utilising big data. This can be achieved by establishing departments and units specialising in its digital and technological aspects, which provide studies and information on the services offered by the company and the extent of customer satisfaction with them.

**Keywords:** Big Data, Customer Experience, K-Card Company.

## Introduction

The rapid transformations taking place in the general business environment—driven by rapid technological and digital development across various fields, and the proliferation of information and data sources to which members of society can turn through easy access—relate to the products and services provided by companies and organisations in the manufacturing and service sectors, whether tangible or intangible, have placed various companies in a position where they face a major challenge amidst the vast amount of data that can be obtained concerning their customers and the users of their products. This data reflects their tastes, needs and preferences regarding specific services and companies, This has required them to work on improving the customer experience and ensuring customers can benefit from their products through easy access and prompt service when needed, whilst reducing the effort and cost borne by customers and making it easier for them to enquire about services, how to access them, and how to resolve any issues they may face, as these interactions, extensive needs and past transactions generate vast amounts of data that require processing so that they can be utilised in product development and strategic decision-making, with the aim of maintaining the company's market position. Based on the above, this research addresses aspects relating to big data and its importance to companies, as well as examining aspects of the customer experience and how companies can make it enjoyable and appealing to customers, through three main sections: the first covers the research methodology; the second relates to the theoretical framework of the research variables; and the third concerns the research procedures.

**Research Problem**

The customer experience – and how to improve it and make it enjoyable and appealing to customers – has become a growing concern for companies and their management, against a backdrop of significantly expanding competition and their efforts to maintain market share, gain customer loyalty and trust, and expand the base of those who deal with them and benefit from their services, This challenge has served as a major driver for these companies to capitalise on advances in digital and technological innovations, which enable them to access and collect vast amounts of data, often described as 'big data', which requires processing and analysis in order to redefine their strategic direction, the way they deliver their products, and the decisions they take to help improve the experience of their existing customers and attract new ones. Based on the above, the research problem centres on the research question: 'To what extent does big data influence the improvement of the customer experience within the company under study?'

**The significance of the research**

The significance of the research lies in establishing an integrated framework that combines how to utilise the big data held by companies which they are able to analyse and mine to gain a clear insight into customer trends and needs and to transform this into a source for renewing competitive advantage, derived from various sources including customer feedback, enquiries and the problems they face.

**Research Objectives**

The research objectives can be summarised as follows:

1. To analyse the current state of the research variables—big data and the customer experience—within the company under study.
2. To clarify the nature of the relationship between big data and its dimensions, and the customer experience.
3. To analyse the nature of the variation among the dimensions of big data in terms of their impact on improving the customer experience.
4. To determine the nature of the impact of big data on improving the customer experience.

**Research design**:

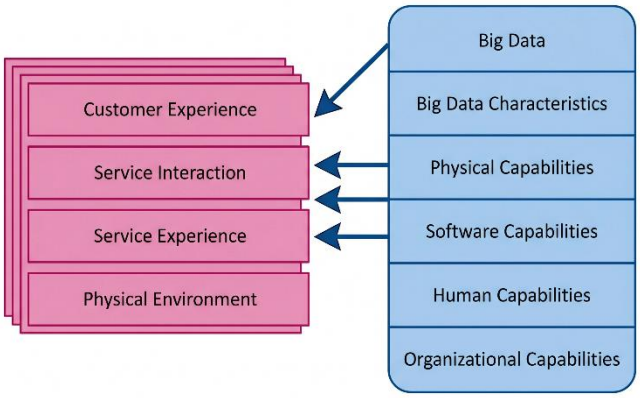


**Figure (1) Research Design**

**Research Hypotheses**

Based on the nature of the research problem and its objectives, and the design illustrating the nature of the relationship between the variables, the following research hypotheses can be derived:

**Hypothesis 1 (H1)**: "There is a correlation at a statistical significance level (0.05) between big data dimensions and the customer experience at the case study company."

**Hypothesis 2 (H2)**: "There is a correlation at a statistical significance level (0.05) between big data and the customer experience at the case study company."

**Hypothesis 3 (H3)**: "The effect of the dimensions of big data on improving the customer experience varies at a statistical significance level (0.05) in the company under study."

**Hypothesis 4 (H4)**: "Big data has an effect at the 0.05 significance level on improving the customer experience at the research company."

**Research Methodology**

Within the framework of diverse scientific research methodologies, and given the nature of the research—which is based on surveying the opinions of a sample of individuals working at the headquarters of the General Administration of K-Card Financial Services Company in Iraq, using a data collection tool (questionnaire)— and in line with the research problem, objectives and hypotheses, the researcher adopted the descriptive-analytical approach to analyse the opinions of the research sample and test the hypotheses.

**Research Population and Sample**

The research population consisted of the General Administration of K-Card Digital Services in Baghdad, Iraq. The research sample comprised 80 employees from the General Administration who were purposively selected from among department and division managers and staff. The characteristics of the sample are shown in Table 1:

**Table (1) Personal Information of the Research Sample**

| Variable | Category | Count | Variable | Category | Count |
|---|---|---|---|---|---|
| **Gender** | Male | 53 | | | |
| | Female | 27 | | | |
| | **Total** | **80** | | | |
| **Educational Qualification** | Diploma | 6 | **Job Position** | Manager | 11 |
| | Bachelor's | 26 | | Assistant Manager | 12 |
| | Higher Diploma | 9 | | Division Head | 45 |
| | Master's | 24 | | Employee | 12 |
| | PhD | 15 | | | |
| | **Total** | **80** | | | **80** |

**Source: Compiled by the researcher**

**Sources of data collection**

Given the nature of the research methodology, which is based on the descriptive-analytical approach—involving the theoretical framing of the variables followed by data collection to test the hypotheses—I have divided the sources of data collection into two categories:

1. Primary data sources: These consist of data obtained through the main research tool, the questionnaire, for the purpose of identifying the reality of the application of the research variables in the field under study, The questionnaire was developed based on the study by Madi (2026) regarding big data, and the study by Nouri and Khalil (2022) regarding the customer experience, as detailed in Appendix (1), using a five-point Likert scale

2. Secondary data sources: Secondary data comprises studies, research papers, books and journals that help provide a theoretical framework facilitating the reader's understanding of the research's directions and objectives, as well as the problem for which it seeks solutions.

**Scope of the research**

The scope of the research is divided into three categories:

1- Conceptual scope: This comprises the research variables and their sub-dimensions.

2- Geographical scope: The geographical scope of the research is limited to the General Management of K-Card Iraq.

3- Temporal scope: The period covered by the theoretical and practical aspects of the research extends from 23 December 2025 to 14 February 2026.

**Statistical tools**

As part of the statistical analysis of the raw data, the researcher utilised several analytical statistical tools, as follows:

1. Descriptive statistics: arithmetic mean, standard deviation, significance level and their ranking.
2. Correlation analysis: the researcher used Pearson's correlation coefficient and the significance level to determine the nature and direction of the relationship between the variables.
3. Analysis of causal relationships: Multiple linear regression was employed to test the variation among big data dimensions in their impact on the customer experience. Simple linear regression was used to determine the effect of the big data variable on improving the customer experience.

**Theoretical Framework**

**The Concept of Big Data**

Big data reflects one of the most significant outcomes of the rapid development in information technology, as a result of which companies have had to deal with vast quantities of data generated continuously from their various economic, administrative, marketing, digital and operational activities. This data originates from multiple sources, is generated rapidly and is of enormous volume, This has compelled companies to work on storing and processing this data to transform it into value for themselves, as an absolute necessity (Krib and Farah, 172, 2022). Big data is no longer merely an accumulation of data, but rather refers to sets of data whose complexity and volume exceed the capacity of traditional databases to manage, store and process them rapidly (Oncioiu et al., 2019:2). Thus, the essence of big data's value lies in the interplay between its volume, the speed at which it is generated, the diversity of its sources, the reliability it reflects, and the value derived from it; this makes the data complex, whilst at the same time providing the necessary support for sound decision-making when analysed properly (Gandomi & Haider, 2015: 137). On the other hand, big data is understood as an information asset that requires advanced technological tools, analytical methods, human skills and organisational readiness to transform data from raw material into valuable knowledge (De Mauro et al, 2016:122). As such, big data represents a strategic resource for organisations, as it supports forecasting, performance improvement, the management of uncertainty, and the ability of management to make evidence-based decisions rather than relying on intuition (Madi, 59:2026). Consequently, big data is described as large volumes of data characterised by high velocity and diverse sources, with a complex structure comprising both unstructured and structured data from varied sources, which requires advanced processing and analysis capabilities to extract valuable information for operational and strategic decision-making.

**The importance of big data**

The importance of big data stems from the fact that it is one of the key indicators of technological development within companies, as it presents both opportunities and challenges in decision-making. This is due to the broad overview it provides of business activities, and its ability to integrate various operational, financial, administrative and internal and external data, which supports management in gaining a comprehensive understanding of the company's situation (Al-Azmi et al., 1011, 2022). Big data fosters rationality in decision-making, as it relies on information relevant to reality rather than on conjecture and expectations (Madi, 61:2026). This makes it crucial for companies' strategic foresight in formulating future projections to inform decision-making (Richards & King, 2014:394). This is achieved through the effective management of risks and financial forecasts

(Abu Zeid, 744:2025). Reliance on guesswork and intuition in decision-making is reduced, as big data improves corporate efficiency through predictive analytics (Gartner & Hiebl, 2017:47). The importance of big data lies in the fact that the information becomes more accurate and detailed, as it is extracted from vast amounts of real-world data (Abdulaziz, 2:2025). This comprises real-time data on the various activities and operations carried out by the company and those with which it interacts (Warren et al., 2015:400). Companies' reliance on big data in their decision-making helps to strengthen internal controls and integrate the various systems on which they depend, rather than maintaining separate, traditional databases and systems (Alles, 2015:349). Big data is considered one of the most important pillars of digital transformation, as it helps companies build advanced systems for making informed decisions (Abdulrahman et al., 585:2025).

**Dimensions of big data**

Given the varying views amongst researchers regarding the definition of the dimensions of big data in organisations, the researcher drew upon a study by Madi (2026, p. 63) to identify five dimensions, as follows:

**1. Characteristics of big data**: These characteristics represent what distinguishes big data from traditional data in terms of volume, variety, reliability, value and the speed at which it is generated, indicating that standard analytical tools are insufficient for handling it (Gandomi & Haider, 2015:138). Volume refers to the quantity of data that can be obtained from various organisational activities, internal processes and external interactions (Lee, 2017:293). Variety, on the other hand, refers to the types of data that can be obtained from structured and unstructured records, textual data, digital sources such as images and videos, social media data, and the Internet of Things (Cappa et al., 2021:49). Reliability is the most important distinguishing feature of big data, as it is characterised by credibility in being derived from accurate, non-hypothetical sources and statistics (Hazen et al., 2014:72). The value of big data lies in the potential to gain insights derived from the transformation of vast amounts of raw data into metrics and actionable performance information used in decision-making (McAfee et al., 2012:61). The aspect of speed in big data relates to the collection, transmission and processing operations that characterise real-time data-handling systems (Katal et al., 2013:404).

**2. Physical capabilities:** Physical aspects refer to the digital and technological infrastructure possessed by companies, which enables them to collect, store, transmit and secure data, and facilitates its processing; this infrastructure comprises hardware, equipment, storage servers and data centres (Hu et al., 2014:653). The importance of physical capabilities is evident in their role in enhancing a company's ability to utilise data to address developments in the internal and external business environment and the ever-growing volume of data (Gupta & George, 2016:1051). Physical capabilities refer to the ability to integrate data sources and facilitate data flows both internally across company departments and externally with suppliers, customers and other organisations, thereby facilitating coordination and synchronisation of work (Oncioiu et al., 2019:1).

**3. Software capabilities:** These capabilities consist of the applications, systems, algorithms, analytics platforms and business intelligence tools used to manage databases containing data on various activities and processes, and the ability to extract information from them and transform it into valuable performance indicators and metrics, through data mining and search capabilities, text analysis, statistical analysis, and the use of dashboards that assist in providing predictive analytics and performance charts (Liu et al., 2023:169). These capabilities are important, as data does not represent real value in itself unless it is organised, analysed, interpreted and presented clearly to decision-makers (Ranjan, 2009:60). Software enables companies to move from traditional descriptive reports to predictive analytical reports that meet the requirements of decision-makers (Davenport & Harris, 2007:171).

**4. Human capabilities:** Human capabilities consist of the knowledge, skills, experience and past expertise possessed by individuals within organisations, as well as their ability to think analytically when dealing with big data, These capabilities include data processing specialists, technical experts in technology, statisticians, and decision-makers capable of understanding data processing indicators and summaries, interpreting the results, and linking them to the company's strategy (Davenport & Patil, 2012:70). The importance of this aspect stems from the fact that the value and significance of physical and software capabilities do not realise the desired value from handling big data unless the company possesses experienced human resources capable of utilising these various capabilities correctly (Sledgianowski et al., 2017:38). Human capabilities are of greater importance in dealing with physical, electronic and digital aspects, as well as data systems, as they depend on the professional and technical competence of the workforce (Metwally and Hussein, 639:2023).

**5. Organisational capabilities:** Organisational capabilities encompass the administrative, cultural and strategic aspects that enable a company to utilise big data. This dimension includes support from senior management, the existence of a strategy for handling and utilising big data, financial resources, and networks for interaction among staff, and data governance that integrates the analytics underpinning strategic and operational decisions (Popovic et al, 2019:18). These capabilities are essential for companies, as the availability of technology alone is insufficient to capitalise on big data unless companies possess a clear strategy, effective executive support and the ability to respond to change (Wamba et al., 2017:356). Organisational capabilities are essential for developing data- and evidence-based decision-making processes by linking technical and technological resources with managerial and strategic practices and organisational learning (Shamim et al., 2019:103–135).

**The concept of customer experience**

Customer experience has become one of the central concepts in contemporary marketing, as companies no longer compete solely on the basis of the product or service itself; rather, the value perceived by the customer has become the basis for competition between them. From the **perspective of managerial stimuli**, the customer experience is represented by the customer's response to the stimuli provided by the company, such as staff behaviour when dealing with the customer, service delivery, service touchpoints, brand value, and channels of communication with the company (Becker & Jaakkola, 2018:630). From the **interaction perspective**, the customer experience consists of interactions between the customer and the product, service or company—or parts thereof—and the resulting personal reactions at the emotional, rational, physical and relational levels (Gentile et al, 2007:397). Within the **context of the customer journey**, the customer's experience is shaped by several touchpoints and stages of interaction; this means that the customer does not judge the nature of the company solely on the basis of their first encounter with it or their initial use of its services. Rather, the customer's experience and judgement depend on a series of interactions prior to receiving the service, whilst using it, and after benefiting from it (Lemon & Verhoef, 2016: 69). From the **integrated channels perspective**, the customer's experience and their evaluation of the company are reflected through the various channels they pass through when obtaining the product or service, including communication channels, personalisation, the services provided or products available, the potential value, the nature of pricing, on-time delivery, return options, accuracy of information and loyalty programmes (Rahman et al., 2022: 611). From a **digital perspective**, the customer experience arises through digital platforms for accessing the product or service and their ease of use, the possibility of personalisation according to need and demand, and the ability to reduce the time and effort required of customers whilst increasing their satisfaction (Bin Hamlawi, 2025:98). Within the framework of the **social and emotional perspective**, the customer experience encompasses the emotional and social responses demonstrated by the company and its staff in their dealings with the customer; these

emerge when the customer feels anxiety, empathy or distance whilst interacting with the company or one of its representatives (Liu-Thompkins et al, 2022:1198). From the **knowledge management perspective**, the customer experience is not merely a marketing outcome; rather, it encompasses managerial domains that rely on the dynamics of knowledge, information exchange and organisational learning in the context of responding to customers' needs and reactions (Al-Lami and Al-Zubaidi, 14:2023). Based on the above, the researcher defines the customer experience as a subjective, cumulative and multidimensional response arising from direct and indirect interactions with the company and its staff, its products and services, the physical environment of the company and its branches, and its social interactions, in a way that influences customer satisfaction, loyalty, purchase intention and happiness, as well as the customer's mental image of the company.

**The importance of the customer experience**

Understanding the customer experience helps companies to see how customers perceive the value of their products and services through real-life interactions, rather than relying solely on promises and promotional messages (Gahler et al, 2023:191). This experience forms the basis for determining a company's positioning in the eyes of customers relative to its competitors, and the extent of their satisfaction with what it offers (Kim & Kim, 2022:1). The customer experience is therefore crucial in fostering customer loyalty to the company and its services (Manyanga et al, 2022:2). Felix & Rembulan (2023:196) noted that understanding the customer experience improves e-commerce by providing a user-friendly interface, discounts, a rapid and secure response, and support for the customer experience, all of which foster greater loyalty and satisfaction among customers. Al-Baydani and Al-Amri (2025:67) highlighted that the customer experience can be enhanced through interactive marketing, which fosters interaction, communication, responsiveness, trust and service quality in dealing with customers, thereby providing them with a valuable emotional, cognitive and behavioural experience. The customer experience is influenced by a company's pre-sales services, including prompt responsiveness, appropriate design, pricing, production scheduling, service delivery and communication prior to the completion of the purchase; these factors shape the customer's assessment of the company (Al-Arifi, 59:2024). The customer experience is therefore crucial to organisational excellence, as customers evaluate a company based on the quality of its services, its performance, its interaction with them, and the extent to which it meets their expectations (Rabih, 2025, p. 36). Nouri and Khalil (2022, p. 338) noted that the customer experience helps companies to continuously improve their services by understanding how customers evaluate them. Understanding the customer experience contributes to achieving competitive advantage for companies, as it enables them to identify changes in customer preferences and behaviour, and to adapt their marketing practices in line with the expected customer experience (Al-Naimi, 2018, p. 63). Knowledge of the customer experience helps to minimise the risks of marketing myopia arising from a lack of understanding of customers' preferences and desires, which in turn enhances customers' purchase intent and their interactions with the company's products and services (Omar, 2025:306).

**Determinants of the customer experience**

The customer experience does not arise in a vacuum or simply from the use of a product or service; rather, it is the result of a set of determinants that influence customers' perceptions and evaluations of the product or service. These determinants are:

1. The physical environment: This environment influences the customer experience, whether it be the design of facilities and equipment, or the cleanliness and comfort of the premises where the service is provided within the company, as it significantly affects customers' emotional experience, their knowledge, and their assessment of the safety, suitability and quality of the company's environment (Abdulrasul & Awad, 2021, p. 308).

2. Staff interaction: The customer experience is largely shaped by the way company staff interact with customers, their communication style and their responsiveness to customers, all of which contribute to enhancing customers' emotional and behavioural experiences (Al-Baydani & Al-Amri, 2025, p. 69).
3. **Organisational service climate**: The organisational climate for service delivery influences the customer experience through the ability of company staff to share information and knowledge about the product or service with customers, as this reflects the company's culture (Hussein, 2022, p. 63).
4. **Digital and technological aspects**: These are characterised by the availability of websites and communication platforms that enable customers to access products and services easily and quickly, and allow for seamless navigation between the offerings provided (Bin Hamlawi, 76:2025).
5. **Pre-sales services**: These are an important factor influencing the customer experience, as they help shape customers' first impressions of the company's products and services and of how its staff interact with customers (Al-Arifi, 59:2024).

**Dimensions of the customer experience**

Given the variety of researchers' perspectives on defining the dimensions of the customer experience, and in accordance with the nature of this research, the researcher has adopted three dimensions addressed in the studies by (Omar, 2025), (Nouri and Khalil, 2022) and (Hadi, 2021)

1. Interaction with the service: Interaction with the service involves direct or indirect communication between the customer and company staff during the service request, which may take place via digital channels, the company's service centres, or one of its agents (Becker & Jaakkola, 2020:634). This dimension reflects the company's ability to respond swiftly through open communication, as well as the customer's trust in the company and its capacity to maintain ongoing communication, with the aim of providing support and resolving issues that hinder the use of its services (Al-Baydani & Al-Amri, 2025:20–21). Communication in the provision of digitally-based services is no longer limited to employees or agents; chatbots and artificial intelligence have now become integral to this process (Nicolescu & Tudorache, 2022:5). Interaction with the service is thus defined as the customer's assessment of the company's ability to provide direct communication channels and a rapid response to help resolve issues and present offers, with the aim of maintaining positive communication before, during and after the service is provided (Felix & Rembulan, 2023:200).
2. **Service experience**: The service experience reflects the customer's perception of the service received, which includes the ease of procedures, service quality, emotional impression, satisfaction with the service and the extent to which it meets their expectations. This dimension reflects the subjective response that emerges throughout the service delivery process as a whole and the customer's participation in value creation (Becker & Jaakkola, 2020: 634). The service experience is not limited to the purchase process, but extends throughout the customer's journey in searching for, obtaining and utilising the service; it reflects aspects of monitoring the customer's experience at various stages, with the aim of identifying areas requiring improvement and development (Gahler et al., 2023:202). The quality of the service provided plays a prominent role in achieving customer satisfaction and influencing behavioural responses, which form the core of the customer's assessment of the value they derive from the service (Kim & Kim, 2022:11). The service experience is shaped in the pre-purchase stage, when the customer evaluates the company, its readiness, responsiveness, pricing and method of service delivery; these factors play a role in reducing the customer's uncertainty and contribute to forming a positive impression (Al-Arifi, 2024:59).
3. **The physical environment**: The physical aspects of the customer experience are embodied in the tangible physical environment in which the service is received, including the location of the company, its branches and agents; the design of the physical infrastructure; its commitment to health and safety standards; and the provision of reception and waiting facilities for customers, which are considered

essential elements in the customer's evaluation of the service (Nouri and Khalil, 341:2022). The physical environment is important to customers as it provides visible and tangible indicators used to assess the company's commitment to delivering the service in accordance with the required standards, particularly in the case of intangible services (Abdulrasul and Awad, 2021:306). The physical environment also encompasses operational processes that make the customer feel at ease whilst receiving the service (Kim & Kim, 2022:12). In the context of digital environments, the physical environment extends to include the design and user-friendliness of digital interfaces on service delivery websites, as these are aspects on which customers focus when evaluating a company's digital planning, ease of navigation, user-friendliness and the security of personal information (Felix & Rembulan, 2023:200).

**Research Methods**

**Descriptive Analysis**

This section involves a review of the descriptive analyses of the research variables, with the aim of identifying how they are applied in the research context and from the perspective of the sample participants, as follows:

1. Big Data: As shown in the data in Table (2), at a general level, the 'Big Data' variable achieved a mean score of (3.688) with a significance level of (73.76%). This reflects the consensus amongst the research sample regarding the company's adoption of big data as a fundamental part of its business strategy and service development, given the comprehensive insight it provides into all internal and external aspects of the business and the opportunity it offers to evaluate operations.

**Table (2): Descriptive analysis of the big data variable and its dimensions**

| Dimensions | Mean | Standard Deviation | Level of Importance | Response Level |
|---|---|---|---|---|
| Big Data Characteristics | 3.826 | 0.649 | 76.52% | Agree |
| Physical Capabilities | 3.686 | 0.711 | 73.72% | Agree |
| Software Capabilities | 3.664 | 0.730 | 73.28% | Agree |
| Human Capabilities | 3.706 | 0.653 | 74.12% | Agree |
| Organizational Capabilities | 3.558 | 0.664 | 71.16% | Agree |
| Big Data | 3.688 | 0.502 | 73.76% | Agree |

Source: Prepared by the researcher based on (SPSS.27) outputs.

The data in Table (2) show that the dimension 'big data characteristics' ranked first in terms of critical importance (76.52%) with a mean score of (3.826), with a standard deviation of 0.649. This indicates the importance of big data characteristics from the perspective of the research sample in the company's operations, in line with the logic of utilising data and the development of digital data processing in its decision-making. 'Human capabilities', meanwhile, ranked second in terms of importance at 74.12%, with a mean of 3.706 and a low standard deviation, indicating the importance of the company's human potential in the research field of big data utilisation, as it is this potential that enables the use of technical tools to collect and analyse data and understand the results that aid decision-making. 'Physical capabilities' came third in importance, at 73.72%, with a mean of 3.686, indicating the importance of the physical aspects that constitute the infrastructure of hardware, equipment and support resources, which ensure the analysis of big data, the capacity to handle and store large volumes of data, and the ability to process it. The 'software capabilities' dimension ranked fourth in importance at 73.28%, with a standard deviation of 3.664, indicating that the research sample agreed on the company's focus on developing and utilising the best software to support big data analysis and enable data mining and processing. In fifth place was the 'organisational capabilities' dimension, with an importance score of 71.16% and an arithmetic mean of (3.558), indicating consensus amongst the research sample regarding the importance of organisational aspects

that provide the organisational structure, incentives and financial support, which in turn facilitate the application of big data principles in the company's operations and activities.

2. Customer experience: As shown in Table (3), the customer experience variable achieved an arithmetic mean of (3.657) with a significance percentage of (73.14%) and a low standard deviation, indicating agreement amongst the research sample regarding the company's focus on improving the customer experience by providing services tailored to customers' requests and needs, ensuring they can be experienced and accessed at the appropriate time and place, and facilitating access to the locations where these services are provided.

**Table (2) Descriptive Analysis of the Big Data Variable and its Dimensions**

| Dimensions | Mean | Standard Deviation | Level of Importance | Response Level |
|---|---|---|---|---|
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| Organizational Capabilities | 3.558 | 0.664 | 71.16% | Agree |
| Big Data | 3.688 | 0.502 | 73.76% | Agree |

Source: Prepared by the researcher based on (SPSS.27) outputs.

In terms of dimensions, the 'service experience' dimension ranked first in importance with a percentage of 75.28%, an arithmetic mean of 3.764 and a low standard deviation, indicating the company's focus on enabling its customers to choose from a variety of offers and responding to their problems and suggestions by providing opportunities to experience different services. As for 'Interaction with the Service', this came second in terms of importance with a percentage of 73.64% and a mean of 3.682, indicating that, according to the views of the research sample, the company works to provide customers with the opportunity to experience its services and express their opinions on them, in order to gather their feedback and suggestions for improvement and development. Ranking third in importance was 'physical environment', with a percentage of 70.48% and an arithmetic mean of 3.524, indicating consensus amongst the sample participants regarding the company management's focus on creating a physical environment in customer reception areas that makes customers feel valued, whilst providing facilities that enable them to access services as quickly and conveniently as possible.

**Testing the correlation**

This aspect of the research examines the extent and direction of correlations between the variables and dimensions, to demonstrate the degree of synergy between them:

**Hypothesis 1 (H1)**: "There is a correlation at a statistical significance level of 0.05 between the dimensions of big data and the customer experience at the company under study": In the context of testing the correlation using Pearson's correlation coefficient, Table 4 shows that the dimensions of big data (characteristics of big data, software capabilities, human capabilities and organisational capabilities) had correlation coefficients with the customer experience of (0.532, 0.558, 0.526, 0.5279) respectively; these correlations are described as strong according to the criteria set out by Cohn (1998). However, the correlation coefficient for 'physical capabilities' with the customer experience was 0.376 which is a moderate correlation. This highlights the synergistic relationship it shares with the customer experience and its value to the company in its efforts to improve the customer experience and the way it interacts with customers, thereby enhancing their trust and loyalty to its services. Based on the above, **Hypothesis 1 (H1)** is accepted.

**Hypothesis 2 (H2)**: "There is a correlation at a statistical significance level of 0.05 between big data and the customer experience at the company under study": It is evident from the data in Table (4) that

the correlation between big data and the customer experience is a strong positive correlation, as indicated by the correlation coefficient (0.696), which is statistically significant at a significance level of (0.05), suggesting that members of the research sample perceive the company as working to improve the experience of its customers and service users by utilising insights and realistic analysis to evaluate its activities, operations and customer responses, thereby enabling it to improve services and introduce new ones. Based on the above, **Hypothesis 2 (H2)** can be accepted.

**Table (4) Values of correlation coefficients between big data and its dimensions and customer experience**

| Dimensions | Customer Experience (Pearson Correlation) | Sig |
|---|---|---|
| Big Data Characteristics | 0.532 | 0.000 |
| Physical Capabilities | 0.376 | 0.000 |
| Software Capabilities | 0.558 | 0.000 |
| Human Capabilities | 0.526 | 0.000 |
| Organizational Capabilities | 0.579 | 0.000 |
| Big Data | 0.696 | 0.000 |

Source: Prepared by the researcher based on (SPSS.27) outputs.

**Testing the relationship of influence**

This aspect concerns testing hypotheses regarding the influence between variables to demonstrate the value and scope of big data in enhancing the customer experience:

**Hypothesis 3 (H3)**: "The effect of big data dimensions on improving the customer experience varies at a statistical significance level of 0.05 in the research field": by using backward multiple linear regression analysis, which involves iteratively refining the regression equation by including all dimensions in the equation during the first stage of the analysis, and then excluding those dimensions that do not have an effect in subsequent stages until a regression equation is reached that includes the dimensions affecting the dependent variable, as shown in Table 5, which presents the third stage of the regression analysis.

**Table (5) Analysis of variance of the impact between big data dimensions in improving customer experience**

| Dimensions | Correlation Coefficient | Coefficient of Determination ($R^2$) | F-Test (Value) | F-Test (Sig) | Slope Coefficient (β) | t-Test (Value) | t-Test (Sig) | Impact |
|---|---|---|---|---|---|---|---|---|
| Big Data Characteristics | 0.709 | 0.503 | 25.628 | 0.000 | 0.233 | 2.802 | 0.005 | Exists |
| Physical Capabilities | | | | | | 0.361 | 0.719 | Does not exist |
| Software Capabilities | | | | | 0.248 | 3.466 | 0.001 | Exists |
| Human Capabilities | | | | | | 1.353 | 0.180 | Does not exist |
| Organizational Capabilities | | | | | 0.269 | 3.278 | 0.002 | Exists |

Source: Prepared by the researcher based on (SPSS.27) outputs.

Table 5 shows that the dimension (**Big Data Characteristics**) has a positive effect on the customer experience, with a coefficient of determination (β) of (0.233) when it increases by one unit; This effect is statistically significant, as indicated by a t-value of 2.802, which is greater than the critical value of 1.96 at a significance level of 0.05. Similarly, the 'programming capabilities' dimension has a positive effect on improving the customer experience by a coefficient of determination (β) of 0.248 when it increases by one unit; this effect is statistically significant, as indicated by a t-value of 3.466 which is greater than its critical value when it increases by one unit; this effect is statistically significant, as indicated by a t-value of 2.802, which is greater than the critical value of 1.96 at a significance level of 0.05. at a significance level of 0.05. Furthermore, the 'organisational capabilities' dimension has a positive effect on improving the customer experience by a slope coefficient (β) of 0.269 when increased by one unit; this effect is statistically significant, as indicated by a t-value of 3.466 which is greater than its critical value when it increases by one unit; this effect is statistically significant, as indicated by a t-value of 3.278, which is greater than the critical value of 1.96 at a significance level of 0.05. The regression equation is characterised by a correlation relationship, as indicated by the coefficient of determination ($R^2$) of 0.709, which points to the strong relationship between the dimensions (characteristics of big data, software capabilities and organisational capabilities) and the customer experience, as well as an adjusted coefficient of determination ($R^2$) of 0.503, which indicates that these dimensions contribute 50.3 per cent to the potential for improving the customer experience at the company under study, according to the research sample's assessments. Furthermore, the multiple regression model exhibits high stability, as evidenced by an F-value of 25.628 at a significance level of 0.05.

As for the two dimensions (material capabilities and human capabilities), they were excluded from the linear regression equation in the third stage of the regression analysis, as shown in Table 5, due to their weak impact on improving the customer experience, as indicated by their respective t-test values of (0.361–1.353) respectively, which are below the critical value (1.96), as well as their significance levels (Sig) of (0.719–0.180), which are below the assumed threshold (0.05), leading to their exclusion from the final linear regression equation.

Based on the foregoing, and given the varying impact of the dimensions of big data (big data characteristics, hardware capabilities, software capabilities, human capabilities and organisational capabilities) on improving the customer experience according to the backward multiple linear regression model, **Hypothesis 3 (H3)** is accepted, which indicates that the impact of big data dimensions on improving the customer experience varies.

**Hypothesis 4 (H4)**: "There is a statistically significant effect (at the 0.05 level) of big data on improving the customer experience at the company under study": The data in Table (6) show that the independent variable (big data) accounts for 48.5 per cent of the improvement in the customer experience, as indicated by the coefficient of determination ($R^2$), which indicates the high value that the research company derives from utilising its capacity to handle big data in enhancing its understanding of its environment and the value it provides to customers through its services. This enables it to analyse the reality and use the insights gained to improve its customers' experience of its services and capitalise on them. The impact model is characterised by high stability, as indicated by an F-value of 73.354 at a significance level of 0.05. In terms of quantifying the extent to which big data improves and positively transforms the customer experience, the slope coefficient (β) of 0.784 meaning that enhancing the company's capabilities in reading, analysing, summarising and utilising big data in decision-making contributes to improving the customer experience by the magnitude of the coefficient of determination (β), as the effect coefficient is statistically significant with a t-value of 8.565 at a significance level of 0.05. Based on the above, **Hypothesis 4 (H4)** is accepted.

**Table (6) Testing the impact of big data in improving customer experience**

| Variables | Coefficient of Determination ($R^2$) | F-Test (Value) | F-Test (Sig) | Slope Coefficient (β) | t-Test (Value) | t-Test (Sig) |
|---|---|---|---|---|---|---|
| Big Data | 0.485 | 73.354 | 0.000 | 0.784 | 8.565 | 0.000 |

Source: Prepared by the researcher based on (SPSS.27) outputs.

**Conclusions**

Based on the findings, several conclusions can be drawn regarding the various aspects of the research, as follows:

1. The company under study has a clear understanding of the value of big data and its impact on its operations, recognising the various dimensions that assist it in handling, processing and utilising data to inform decision-making.
2. The company has a clear understanding of the importance of improving the customer experience and how to engage with customers, as well as how to enhance and develop this experience by offering a variety of packages and making these available for customers to evaluate and adjust in line with their feedback.
3. The company recognises the value of leveraging the interconnection between big data and the customer experience, as this provides valuable insights that help it understand customer requirements by gathering information about them and using it to develop and deliver new services.
4. The company utilises big data to identify its various dimensions and the impact of each, determining which aspects best support the customer experience and deliver value through the use of big data in its operations and activities.
5. The company actively utilises its research capabilities to harness its potential in handling big data – in terms of collection, analysis and mining – and to use the results of these processes to support the delivery of its services, demonstrate the value that can be realised for customers, and meet their needs and expectations in order to provide them with the highest value and quality.

**Recommendations**

Based on the findings and conclusions of the research, several recommendations can be made:

1- The importance of working to develop strategies for utilising big data technologies and providing the technological and software infrastructure necessary to process and analyse big data.
2. The need to attract talented and skilled individuals, and to provide training and development programmes for existing staff, enabling them to work with big data technologies and utilise them in line with the organisation's direction and strategy.
3- The importance of providing organisational support to integrate the requirements of the transition towards utilising big data by establishing departments and units specialising in its digital and technological aspects, as well as focusing on human resources management practices such as motivating and evaluating staff in line with these objectives.
4- The importance of continuous work on marketing and service strategies to focus on customers and understand their views, enquiries and issues regarding the use of the company's services, in a way that helps to develop these services with the aim of providing the best customer experience.
5- Taking into account customers' preferences regarding their service experience, which helps to increase their trust, by providing a physical and digital environment that makes it easier for them to access, experience and purchase services.

**Research Limitations**

As part of the researcher's endeavour to demonstrate how big data and its dimensions can be utilised to improve the customer experience through practical application based on the views of some employees at K-Card, this work was not without its complexities. These included the difficulty in

obtaining clear information regarding the company's core operations and the lack of annual reports and data that could be utilised to demonstrate the relationship between the research variables – which would be preferable to relying on the opinions of a sample of individuals. These variables can be analysed and tested using actual data, whilst it is also possible to utilise other dimensions and criteria for each variable to reflect the field under investigation.

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