**The Roles of Big Data for Supporting E-Government Application and Usage in Public Sector, Dubai**

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**Abstract**

**Purpose:** This research will establish the extent of the use of big data analytics in supporting e-government applications within the public sector in Dubai.
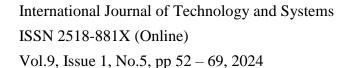
**Methodology:** Specifically, qualitative and quantitative studies were conducted, and qualitative and quantitative studies will be conducted considering the trading method as an instrument combining qualitative and quantitative components. For the quantitative aspect of data collection, a self-administered questionnaire was used, while interviews were conducted for the qualitative. An e-survey was administered to 50 employees drawn from the public sector, and five employees were interviewed in detail. For both the collection of data, convenient sampling was adopted. Descriptive statistics were used to analyze quantitative data, including mean, median, mode, and frequency distribution. Quantitative data were also collected through interviews, and qualitative analysis was performed to derive themes.

**Findings:** The results indicate that big data analytics positively affect the utilization of e-government applications in terms of the effectiveness of decision-making, better management of resources, more substantial transparency, and citizens' engagement. Overall, the findings suggest that citizens get efficient services through big data. In return, they can present their opinions and needs more efficiently to the government. It creates better interactions with government organizations, predicts people's needs, and enables better tracking and representation of results. However, some of the threats included This despite the following identified drawbacks. It is suggested that constant training has to be given at the workplace to create ample data proficiency among the workforce, data privacy has to be established, and further, technological support has to be procured.

**Unique Contribution to Theory, Practice and Policy:** Moreover, the frequency of citizens' increase through marketing promotions and adopting changes over time is fundamental. This means that the inclusion of big data in e-government applications promotes the delivery of handy services to the citizens and enhances the efficiency of the government, hence promoting government transparency. Future research should ensure a more extensive population, investigate other industries, and use statistical analysis to understand big data on e-government better.

**Keywords:** *Big Data Analytics, E-Government Application, Public Sector*
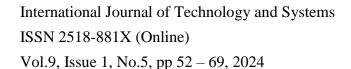
## INTRODUCTION

The Internet, personal computers, and mobile phones have all had a substantial influence on how we live our lives. Additionally, this revolution is affecting governments that use e-government, as governments worldwide recognize the value and advantages of this model and are actively seeking methods to enhance the quality of their public services. E-government (e-governance) is gaining popularity as a form of global governance. Increased use of e-government entails making it easier for citizens to access government services, improving government service delivery, simplifying citizen compliance with government laws, increasing citizen engagement and trust in the public sector, reducing fraud, and increasing government efficiency. A favorable business climate frequently attracts high-quality investors, resulting in beneficial spillover effects such as improved technology transfers and current management techniques, as well as positive environmental consequences. Improved e-government implementation would result in advancements in other areas such as corporate corruption and transparency, among others (Al-Sai and Abualigah, 2017, May). E-government initiatives employ big data to improve public sector services, offering efficiency, transparency, and citizen participation. Some examples are Estonia's e-Residency, which offered a new perspective on digital identities and governments, and Singapore's Smart Nation and Digital Government plans, which implemented the use of big data in urban planning and public services. One successful e-government is the Smart Dubai project, in which big data enhances transport, health, and security. This work aims to reveal the possibilities of extensive data application in e-government, which serves as the basis for examining its effects on the civil service of Dubai

The Roads and Transport Authority, abbreviated public sector, is the primary autonomous government agency responsible for roads and transportation in Dubai, United Arab Emirates. It was established in 2005 and is responsible for planning and executing transportation and traffic initiatives, as well as enforcing citywide transportation regulations and strategic plans. It is a department of the Dubai Government (Shebli et al., 2021).

### Problem Statement

Electronic Governance, also termed e-government, integrates information and communication technology (ICT) to support the government in procedure and structural reformation, increment in operational competencies, increment in quality of public services, and knowledge support for systematic planning and communication among various departments. Therefore, when e-government is fully implemented, a new sociopolitical form of a dynamic, convenient, and participative relationship is created between citizens and the government. This means that martial and public service management must adopt technology to address people's needs, placing them first. ICTs are the enablers that are pushing this change in public administration (Bertot and Choi, 2013). This is the case despite the acknowledged advantages of big data in enhancing e-government applications; there needs to be more knowledge on how these technologies may be deployed to yield optimal results within Dubai's public sector environment. This research will address this gap by assessing the use of big data analytics in the advancement of e-governance applications of CIS countries in terms of efficiency, quality of service delivery, and citizens' involvement. In addition, the study will add new knowledge about big data technology applications in Dubai's PSE and bring about critical recommendations for the practical usage of these tools by

policymakers and administrators. It will outline the current state of e-government applications in circulation. These areas require enhancement and how to apply big data for the enhancement of e-government programs in the administration of the civil service.

## Research Objective

The objective of this research, in the context of public sector Dubai, is to ascertain the role of big data analytics in supporting e-government applications.

## Research Questions

Based on the objectives of the research following questions has been made to lead the direction of research:

- What role does the big data analytics is playing in supporting e-government applications in the perspective of public sector Dubai from the perspective of government?
- What role does the big data analytics is playing in supporting e-government applications in the perspective of public sector Dubai from the perspective of customer?
- What role does the big data analytics is playing in supporting e-government applications in the perspective of public sector Dubai from the perspective of business?

## Research Organization

This study is presented logically. The methodology section follows the introduction and explains how the study was conducted. A methodological literature review provides an overview of the prior research in terms of methodology. Another section is comprised of an investigation, and then the results are discussed. Finally, the conclusion is given along with recommendations in the final section of the research.
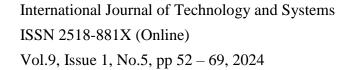
## Research significance

This research is very significant as it will add new knowledge in the domain of e-government by analyzing how big data can be supportive of it. Also, practically this research is very important because it will be helpful for the decision-maker of public sector organization to take decisions regarding increasing their reliance on e-government application. Also, they will understand the role of big data and make strategies to merge it in the e-government application.

## LITERATURE REVIEW

### E-Government and Significance

According to the World Bank (2012), the electronic government is defined as the use of information technology by government agencies charged with the responsibility of exchanging data between citizens, businesses, and all other governmental stakeholder groups. E-government aims to accomplish a wide variety of goals, including enhanced delivery of governmental services to residents, more business and industry cooperation, higher citizen empowerment via information access, and more effective governance (Jacob et al., 2019). The advantages of e-government may include less corruption, more transparency, and increased comfort, as well as income growth and cost savings. Effectively implementing e-government at the national and local levels may help an economy remain competitive while enhancing citizens' trust in their government. Additionally, it has the potential to greatly boost the state's budget while lowering opportunity costs. E-ultimate
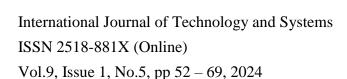
government's objective is to offer citizens a more complete variety of government services efficiently and cost-effectively. Additionally, since it keeps the public informed about the government's programs and policies, e-government may assist promote government transparency. The primary benefit would be the replacement and optimization of the paper-based system, which would occur simultaneously with electronic government adoption. This might result in considerable time and cost savings, as well as environmental advantages, because of the decrease in paper consumption. E-government deployment has the potential to improve communication between the public and commercial sectors (Hussain et al., 2019).

If e-government is considered a subset of e-government services, it has the potential to streamline communication between government and business by enabling smaller businesses to compete with bigger companies in public tenders such as government contracts. In this sense, e-government may benefit the economy by fostering a more open and transparent market. When compared to the past, organizations and individuals today can get information more quickly and at any time of the day. Anyone, regardless of where they live or their socioeconomic situation, can obtain e-government and its advantages (Manoharan and Ingrams, 2018). Additionally, it may result in cost savings for both people and organizations. Therefore, it's unsurprising that politicians and executives in every country, from the most developed to the least developed, are keen to adopt electronic management. Improved living circumstances are accomplished via e-government, which has emerged as a crucial tool for governments and their constituents. While some regard e-government as a symptom of the digital revolution, it helps governments, citizens, the business sector, and all other stakeholders in the public sector and beyond (Twizeyimana & Andersson, 2019).

## Role of Big Data to Support E-Government Application

The information society fundamentally alters people's perceptions of the possibilities for using information resources in the public administration system. When it comes to enabling the interchange of information between authorities, relevant and trustworthy open information serves as the "engine" of the public administration system. Additionally, the move to an information culture has altered perceptions of the public administration system's functioning (Bertot and Choi, 2013). The advancement of information and communication technologies (ICT) and the establishment of electronic government (e-government) have had a significant influence on the public administration system and political processes. Now, the development of modern technologies and the demand for public services are altering e-government activities. Developing effective governing systems necessitates the creation of a new notion of e-government oriented around direct democracy. Now, concepts for establishing new e-government governance processes are being implemented via the use of modern technologies that promote transparency (Al-Sai and Abualigah, 2017, May).

As ICT usage has grown exponentially in recent years, technology has influenced practically every element of society and the economy, simplifying and streamlining mundane processes. ICT has been a direct contributor to the growth of e-government. Municipalities and their citizens are intricately linked: incorporating a business, registering a car, developing real estate, and even enrolling a child in school all need interaction with the municipality. The changes made to the operations of the government and local self-governance organizations are intended to create a more effective management system. Now, the ability to use big data is critical for the creation of efficient
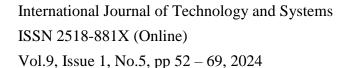
governance systems. The rapid advancement of information technology enables the construction of a new and effective system of governance for big data operations (Al-Mushayt, 2019). In 2014, the use of cloud technology was shown at the Global Entrepreneurship Congress, with a particular emphasis on the role of government agencies in assuring the availability of open data. When it comes to business intelligence and data analytics, Large Data Analytics is a method that incorporates both conventional and big data. The government-wide Analytical Engine collects data from a variety of sources, including government department databases, the internet, social media, sensors, and machine logs. This results in a massive increase in the number of transaction data generated each day in e-governance, necessitating the use of Big Data Analytics (Bertot et al., 2014).

Analytics of big data gives insight into the effectiveness of government programs and policies, as well as why they work (Descriptive and Decisive Analyses). It assists in establishing future scenarios and recommending the optimal course of action (Predictive and Prescriptive Analysis) to gauge individuals' feelings and ascertain their opinions and attitudes about government policies. To personalize e-government services and increase efficiency, business analytics utilizes big data potential. Additionally, the use and management of big data are examined in related administrative structures in terms of challenges such as data integration, digital secrecy, and security risk. Big Data Analytics enables the use of an infinite quantity of data, the most notable data for analyzing public sentiment and improving government. For analysis, structured data from newspapers, blogs, social media, news channels, emails, reports, satellites, and photos is employed. Big data analytics enables the government to forecast the future and prepare relevant interventions or course corrections in all critical socioeconomic areas such as healthcare, education, welfare, urban/rural development, and infrastructure (Anshari and Lim, 2017).

With big data technology, it is feasible to handle massive volumes of unstructured data. To manage and analyze data with high volume, high velocity, high diversity, high value, and high authenticity, technologies such as Hadoop and Mapreduce, as well as NoSQL and Data Discovery, are being developed. Due to the research and development given by new technologies, unmatched functionality and efficiency are now feasible. E-government systems are complicated and provide a broad variety of services to both individuals and businesses. In today's technology-driven society, massive volumes of data are a serious worry. Big data application potential must be addressed when implementing e-government projects in terms of providing efficient services to residents and businesses, as well as the future development of successful applications (Hou, 2017). The government may be PROACTIVE rather than REACTIVE via the use of data analytics. The government can respond quickly and agilely to opportunities, threats, and difficulties. While conventional data may be utilized to detect these possibilities and hazards now, collecting, cleansing, standardizing, and then analyzing them will take time. The use of big data technology may significantly improve the efficiency of completed e-government initiatives. Although cost reduction is a primary objective, another critical objective is to improve the efficiency of reciprocal information sharing between individuals, corporate sectors, and government organizations (SALISU, 2015).
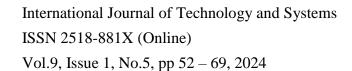
## Theoretical Framework

### Technology Acceptance Model (TAM)

Davis brought the Technology Acceptance Model, central to understanding how and why users accept and integrate technology (Granić & Marangunić, 2019). According to TAM, two variables known as perceived usefulness and perceived ease of use predict an individual's behavioral intention to use a particular technology, which determines actual use. As the subsequent sections will depict, TAM is highly relevant in the context of big data analytics supporting e-government applications in Dubai's public sector. Characterized by how meaningful they perceive big data analytics to be in improving the service delivery of e-government services, this pertains to perceived usefulness and relates to the public sector employees and citizens (Davis et al., 2023). If the users believe that these applications enhance productivity, rationality, and service delivery, then the chances of adopting such applications are high. Greater perceived usefulness is the degree to which users consider big data applications useful for their tasks, while perceived ease of use is the extent to which users consider the big data applications easy to use. If these technologies are easy to use and intuitive, their usage might be high. Therefore, TAM can assist in defining the factors that can facilitate or suggest the rejection of big data analytics in e-government, consequently contributing to the development of the strategies that impact these factors.

### Difussion of Innovation Theory (DOI)

DOI is a theory developed by Rogers to explain the rates of the spread of innovations. It is now well established that innovations and change neither take place simultaneously all over the world nor occur haphazardly and that organizations and organizations do not have the same receptiveness to innovations and change. This theory which was developed by Everett Rogers in 1962, delineates systematically and in details a theoretical explanation and systematic model of change and innovation that occurs across societies (García-Avilés, 2020). DOI outlines five key attributes that influence the adoption rate of innovation: Relative advantage is the first success factor, which involves the ability of the innovation to be favored over the old practice; compatibility is the ability of the new practice to be easily integrated with the existing one, while complexity relates to the level of difficulty in implementing the new practice, while trial ability is the possibility of trying out the new practice without fully implementing it, and observability is the extent to which the effects of implementing the new practice can be observed. By applying DOI to the case of adopting big data analytics for e-government in Dubai, this study shows how the attributes affect implementation. Relative advantage refers to the perceived benefits of using extensive data analysis compared to prior methods in improving decision-making and service delivery. Compatibility establishes the extent to which the applied big data technologies match the public sector's current values, past experiences, and needs (García-Avilés, 2020). The complexity factor looks at the difficulty users would experience when attempting to comprehend the technology, or in other words, the ease or otherwise of implementing the technology for proper use. Trialability implies that some activities can be tested before the actual implementation of the technology, decreasing uncertainty. This relates to the physical aspect of big data, where it is easy to measure its various positives and help in the push toward acceptance. This way, the study can investigate,

with the help of DOI, the critical success factors that can influence the diffusion of big data technologies in e-government, which strategies are helpful for implementation, and what challenges might be expected.

## Summary and Research Gap

A review of the prior literature on big data in e-government on application finds it to be a well-studied area and a rich exploration across views, methods, and continents. Research has provided a supportive analysis of how big data analytics can transform government services, decision-making, and operational processes. Several scholarly studies have been carried out in different countries, with specimens from countries such as the United States, Singapore, and South Korea indicating the positive impacts of big data in e-government. By way of data collection, surveys and case studies, along with a small quantity of statistical analysis and interviews, have been used to measure the degree of users' perception and adoption rate as well as organizational practices. Despite all these, a few research gaps have been left wide open. On the contextual level, more primary research focusing on applying big data in e-government within specific regions and considering the cultural, political, and institutional peculiarities in the MENA region is called for. A limitation of the present study is the lack of prior longitudinal work that studies the long-term effects of extensive data deployment of e-government after the initial implementation phase, and future research could benefit from using both qualitative and quantitative methods to offer an in-depth perspective on the users' perceptions and policy measures. In terms of geographical locations, although prior literature research has concentrated on developed economies more, the literature needs to be more comprehensive in studying the experiences and issues in emerging market countries. Filling these research gaps will help expand the knowledge of how big data can be utilized effectively in improving government organizational services and public sector performance in developed and developing countries to improve policymakers' and politicians' decision-making and advance the successful implementation of e-government services.

## METHODOLOGY

The following is a description of the research's methodology:

### Research Approach

There are three research techniques and methods including quantitative, qualitative, and combination of both research methods and techniques. This research used a mixed-methods approach, including both qualitative and quantitative analysis. A questionnaire survey was conducted, and the findings examined utilizing the quantitative analysis approach. While interviewing analysis has been conducted by adopting the qualitative analysis approach.

### Data Collection Tool

A questionnaire has been selected as a data collection tool. Two different types of questionnaires have been designed separately for qualitative and quantitative analysis. The demographics and characteristics of the study have been included in a questionnaire prepared for quantitative analysis. This survey questionnaire includes all of the closed-ended questions. There are just a few alternatives available for the responders to choose from. From highly agree to strongly disagree, a

5-point Likert scale has been created. While for the interview analysis open-ended responses-based questionnaire has been designed. These items were also related to variables of research.

## Sample and Population

The population generally consists of all the people from which data can be taken for the research. While the sample is the small group of people drawn from the population that represents them. The population of this study including the employees of the public sector. However, a sample of a few employees has been selected. A sample of five employees has been taken for the interview. While a sample size of 50 has been kept for the questionnaire survey.

## Sampling Technique

There are many sampling techniques including probability and non-probability sampling. However, for this study, the technique of convenient sampling has been selected. In this sampling technique, the people who are most easily accessible have been selected. A convenient sampling technique has been used for both questionnaire and interview techniques.

## Data Analysis

For the quantitative analysis, descriptive statistics have been used in this study. It has described the data pattern of the study. The descriptive techniques include meaning, median, mode, and frequency distribution. However, no inferential technique has been applied.

## Data Collection Process

For Data, collection training has been given about how to collect the data from the respondents. One week has been spent contacting the respondents and asking for their time. The interview has been taken face to face while the survey questionnaire has been filled out by the respondents through email. The whole process of Data collection has been completed in two weeks.

## RESULTS

Both quantitative and qualitative data are used in this study to obtain the results of the study. Values of mean, median, mode, and frequency distribution are used to analyze the data. The result of the analysis is presented in the tables below.

## Demographics

The following tables are representing the demographic data of the participants.

**Table 1: Gender**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Male | 30 | 60.0 | 60.0 | 60.0 |
|  | Female | 20 | 40.0 | 40.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

**Table 2: Age**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Below 24 years | 15 | 30.0 | 30.0 | 30.0 |
|  | 24 to 30 years | 20 | 40.0 | 40.0 | 70.0 |
|  | Above 30 years | 15 | 30.0 | 30.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

**Table 3: Designation**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Managerial | 25 | 50.0 | 50.0 | 50.0 |
|  | Non- Managerial | 25 | 50.0 | 50.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

**Quantitative Analysis**

The following tables are representing the result of quantitative analysis.

**Consumer**

**Table 4: Citizens Share the Sentiment with the Government**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 4 | 8.0 | 8.0 | 8.0 |
|  | Disagree | 3 | 6.0 | 6.0 | 14.0 |
|  | Neutral | 3 | 6.0 | 6.0 | 20.0 |
|  | Agree | 21 | 42.0 | 42.0 | 62.0 |
|  | Strongly Agree | 19 | 38.0 | 38.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

**Table 5: Citizens share the requirements with government organizations.**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 3 | 6.0 | 6.0 | 6.0 |
|  | Disagree | 2 | 4.0 | 4.0 | 10.0 |
|  | Neutral | 3 | 6.0 | 6.0 | 16.0 |
|  | Agree | 28 | 56.0 | 56.0 | 72.0 |
|  | Strongly Agree | 14 | 28.0 | 28.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

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**Table 6:  Citizens Receive Better Citizen Services on E-Government Applications due to Big Data**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 4 | 8.0 | 8.0 | 8.0 |
|  | Disagree | 3 | 6.0 | 6.0 | 14.0 |
|  | Neutral | 8 | 16.0 | 16.0 | 30.0 |
|  | Agree | 20 | 40.0 | 40.0 | 70.0 |
|  | Strongly Agree | 15 | 30.0 | 30.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

**Business**

**Table 7: There are Improvements in Online Information and Service Delivery by Governments for Business Analytics**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 4 | 8.0 | 8.0 | 8.0 |
|  | Disagree | 3 | 6.0 | 6.0 | 14.0 |
|  | Neutral | 3 | 6.0 | 6.0 | 20.0 |
|  | Agree | 21 | 42.0 | 42.0 | 62.0 |
|  | Strongly Agree | 19 | 38.0 | 38.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

**Table 8:  Collaboration among Government Authorities and Other Private Businesses Has Been Increased**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 4 | 8.0 | 8.0 | 8.0 |
|  | Disagree | 3 | 6.0 | 6.0 | 14.0 |
|  | Neutral | 11 | 22.0 | 22.0 | 36.0 |
|  | Agree | 19 | 38.0 | 38.0 | 74.0 |
|  | Strongly Agree | 13 | 26.0 | 26.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

**Table 9: Big Data-Based E-Government Help Business Forecast Citizen Demands**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 3 | 6.0 | 6.0 | 6.0 |
|  | Disagree | 3 | 6.0 | 6.0 | 12.0 |
|  | Neutral | 8 | 16.0 | 16.0 | 28.0 |
|  | Agree | 27 | 54.0 | 54.0 | 82.0 |
|  | Strongly Agree | 9 | 18.0 | 18.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

**Table 10: Big Data-Based E-Government Monitor and Visualize Performance**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 4 | 8.0 | 8.0 | 8.0 |
| | Disagree | 2 | 4.0 | 4.0 | 12.0 |
| | Neutral | 3 | 6.0 | 6.0 | 18.0 |
| | Agree | 23 | 46.0 | 46.0 | 64.0 |
| | Strongly Agree | 18 | 36.0 | 36.0 | 100.0 |
| | **Total** | **50** | **100.0** | **100.0** | |

**Government**

**Table 11: The Government is Extracting Intelligence and Insights for New Projects and Optimizing Existing Ones**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 3 | 6.0 | 6.0 | 6.0 |
| | Disagree | 2 | 4.0 | 4.0 | 10.0 |
| | Neutral | 3 | 6.0 | 6.0 | 16.0 |
| | Agree | 23 | 46.0 | 46.0 | 62.0 |
| | Strongly Agree | 19 | 38.0 | 38.0 | 100.0 |
| | **Total** | **50** | **100.0** | **100.0** | |

**Table 12: Big Data-Based E-Government Forecast Citizen Demands**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 3 | 6.0 | 6.0 | 6.0 |
| | Disagree | 3 | 6.0 | 6.0 | 12.0 |
| | Neutral | 3 | 6.0 | 6.0 | 18.0 |
| | Agree | 13 | 26.0 | 26.0 | 44.0 |
| | Strongly Agree | 28 | 56.0 | 56.0 | 100.0 |
| | **Total** | **50** | **100.0** | **100.0** | |

**Table 13: Big Data-Based E-Government Monitor and Visualize the Performance of the Business**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 2 | 4.0 | 4.0 | 4.0 |
| | Disagree | 3 | 6.0 | 6.0 | 10.0 |
| | Neutral | 7 | 14.0 | 14.0 | 24.0 |
| | Agree | 31 | 62.0 | 62.0 | 86.0 |
| | Strongly Agree | 7 | 14.0 | 14.0 | 100.0 |
| | **Total** | **50** | **100.0** | **100.0** | |

**Table 14: Big Data-Based E-Government Brings Transparency in Processes**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 4 | 8.0 | 8.0 | 8.0 |
|  | Disagree | 3 | 6.0 | 6.0 | 14.0 |
|  | Neutral | 5 | 10.0 | 10.0 | 24.0 |
|  | Agree | 20 | 40.0 | 40.0 | 64.0 |
|  | Strongly Agree | 18 | 36.0 | 36.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

**Table 15: Big Data-Based E-Government Helps Ineffective Policy Planning**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 3 | 6.0 | 6.0 | 6.0 |
|  | Disagree | 3 | 6.0 | 6.0 | 12.0 |
|  | Neutral | 8 | 16.0 | 16.0 | 28.0 |
|  | Agree | 21 | 42.0 | 42.0 | 70.0 |
|  | Strongly Agree | 15 | 30.0 | 30.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

**Table 16: Big Data-Based E-Government is Helpful in Fraud Detection by Other Businesses**

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Disagree | 4 | 8.0 | 8.0 | 8.0 |
|  | Disagree | 2 | 4.0 | 4.0 | 12.0 |
|  | Neutral | 5 | 10.0 | 10.0 | 22.0 |
|  | Agree | 23 | 46.0 | 46.0 | 68.0 |
|  | Strongly Agree | 16 | 32.0 | 32.0 | 100.0 |
|  | **Total** | **50** | **100.0** | **100.0** |  |

The results in the tables above are showing that the majority of the respondents agree with the statements that are used in the questionnaire of this study. It means that big data helps make the government and business operations more effective and efficient along with the use of technology. Also, customers are getting more value through these services with advancements in technology.
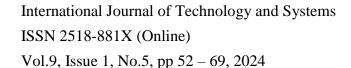
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**Table 17: Descriptive Statistics**

| Statistics | N | Mean | Median | Mode |
|---|---|---|---|---|
| 01. Please specify your gender. | 50 | 1.40 | 1.00 | 1 |
| 02. Please specify your age. | 50 | 2.00 | 2.00 | 2 |
| 03. Please specify your designation | 50 | 1.50 | 1.50 | 1ᵃ |
| 04. Citizens share the sentiment with the government. | 50 | 3.96 | 4.00 | 4 |
| 05. Citizens share the requirements with government organizations. | 50 | 3.96 | 4.00 | 4 |
| 06. Citizens receive better citizen services on e-government applications due to big data. | 50 | 3.78 | 4.00 | 4 |
| 07. There are improvements in online information and service delivery by governments for business analytics. | 50 | 3.96 | 4.00 | 4 |
| 08. Collaboration among government authorities and other private businesses has been increased. | 50 | 3.68 | 4.00 | 4 |
| 09. Big data-based e-government help business forecast citizen demands. | 50 | 3.72 | 4.00 | 4 |
| 10. Big data-based e-government monitor and visualize performance. | 50 | 3.98 | 4.00 | 4 |
| 11. The government is extracting intelligence and insights for new projects and optimizing existing ones. | 50 | 4.06 | 4.00 | 4 |
| 12. Big data-based e-government forecast citizen demands. | 50 | 4.20 | 5.00 | 5 |
| 13. Big data-based e-government monitor and visualize the performance of the business. | 50 | 3.76 | 4.00 | 4 |
| 14. Big data-based e-government brings transparency in processes. | 50 | 3.90 | 4.00 | 4 |
| 15. Big data-based e-government helps in effective policy planning. | 50 | 3.84 | 4.00 | 4 |
| 16. Big data-based e-government helpful in fraud detection by other businesses. | 50 | 3.90 | 4.00 | 4 |

Descriptive statistics are used to examine the trend of the responses given by the participants of the study. The values of mean, median, and mode are used for this purpose. The values indicate the trend of responses towards agreeing with statements that are used in the questionnaire.

**Interview Analysis**

According to the respondent, citizens find the e-government very beneficial. Many of their transport queries have been answered on this application. The citizen shares their feedback on the application through which insight about them can be obtained by the government. Another respondent has expressed that this application provides useful information to the citizens making transport convenient to them. Also, the rules and regulations have been checked by the citizen on applications which can save them from fines. So overall this application provide good customer services

One of the respondents has expressed that due to the Big Data analytics bulk of data has been obtained by the government regarding their clients. Therefore this data helps provide customized solutions and handle the problems of citizens. One respondent has expressed that Big Data analytics makes it possible for the PUBLIC SECTOE  to understand road and transport issues in detail and take decisions based on quality information.

Monitoring and visualization of the performance of the project given by the public sector  to private companies have been made possible through e-government applications. The authority can continuously monitor progressive projects based on the data received in the application by decline, expressed by respondents. Also, monitoring helps to improve the quality of development projects which is a very productive feature of this application. It is also helpful for the businesses because they can also monitor the performance according to the public sector  standard side by side.

One of the respondents has expressed that e-government application is directly linked with technologies of Big Data analytics. It helps make the useful analysis of the data provided to the application so facilitate the decision making. According to the response of another one, this application facilitates the policy planning process. As all of the necessary information is acquired with the help of the e-government application therefore the policymakers make effective policies after analyzing all the aspects.

The final question was about the ability of fraud detection of the application of e-government. If there is any kind of financial fraud has been done by the employee of the authority it has been detected through it. Also if any business to home project is given by the public sector  is involved in any kind of financial fraud is intelligently detectable through this application. So this application is very useful for the road and transport authority of UAE and it has increased its overall productivity.

**Challenges of Big-Data Based E-Government**

There are the following challenges in case of big data-based electronic government structure:

**Acceptance of Change**

Big data analytics consists of technologies that are complicated to handle. It is very difficult for people to shift from the traditional system to the e-government system. Therefore, people can resist these changes.

## High Turnover Rate

Also, there is a high turnover rate of the government staff dealing with their technology and information section. If an experienced person who has good knowledge to deal with the big database and e-government leave the job it becomes challenging for the government organization to manage it. Therefore, the high turnover rate of the skillful IT staff is also a challenge.

## Infrastructure Barrier

If there is not good technology infrastructure that supports, the high-impact technology then the Big Data analytics for the e-government cannot be used.

## Support

It is also a challenge to gain customer and other business support from the government organization for this e-government system.

## Recommendations of Big-Data Based E-Government

## Increase Citizens Participation

It is recommended that the participation of the citizens should be increased through marketing campaigns. Getting their support and feedback is very important to establish a big data-based e-government system.

## Implement Change Gradually

It is also recommended that being complicated in the difficult systems the change should be implemented stepwise by adopting the effective change strategies.
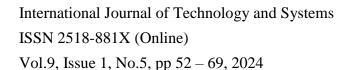
## Give Perks to Technology Staff

The technology staff of the government department should be given perks and good financial rewards, so they do not switch their jobs.

## Conclusion

Government is prohibitively costly and inefficient. E-government offers realistic solutions to this problem. It can reduce related costs while boosting the efficiency with which the government spends its money. E-government can improve and encourage public service participation and utilization. It might also be used to solicit public opinion, increasing public authorities' accountability. E-government may assist governments in meeting their people's transparency standards while also strengthening and deepening partnerships with the public and private sectors. The anticipated advantages of e-government include higher efficiency, expanded services to better serve communities, more access to public services, and increased federal government transparency and accountability.

## Limitations

- The sample size is limited as it has been kept very small. Especially for the interview, the sample size is very small.
- Another limitation of the studies is related to the scope. It has only focused on the case of a single organization in the perspective of e-government applications and big data.

- Finally the analysis technique is limited such that only descriptive statistics have been used. However, there is no use of inferential statistics in this study.

## Recommendations

- In future research, there should be increase in sample size. For instance, the sample size should be increased to 300 for the questionnaire survey and 20 for the interview analysis.
- It is also suggested that in future research this topic should be explored in the case of the other industry because big data-based e-government applications have the potential to improve other departments are also.
- Finally, it is recommended that inferential statistics should be used along with descriptive statistics. Regression and correlation should be included in future studies.

## Contributions to Theory:

- Advancement of Knowledge: The study adds value to the theoretical framework of using big data within e-government applications, especially within the dimension of public sector organizations in Dubai. It extends the literature by offering real-world data and policy suggestions concerning how big data analytics can assist e-government developments.
- Theoretical Frameworks: The study may develop or enhance theoretical frameworks that present the relationship between big data analytics and e-government effectiveness. Combining theoretical frameworks with the research evidence enhances comprehension of the processes that facilitate and determine big data adoption in e-government and its outcomes.

## Contributions to Practice:

- Guidance for Decision-Makers: The research provides a number of conclusions and postulates specific suggestions that can be useful for government authorities and those who design state policies in Dubai and other countries. This paper offers practical recommendations for action founded on prior studies that inform ways to optimize e-government services and processes using big data.
- Operational Efficiency: As a result, the study helps public sector organizations that benefit from e-government applications driven by big data analytics demonstrate operational efficiency enhancement, resource optimization, and better citizen services.

## Contributions to Policy:

- Informed Policy Formulation: This knowledge can feed into e-government policies and strategies, as the present work illustrates big data analytics possibilities. The fact highlighted above can help policymakers conceptualize and formulate policies that encourage the adoption of big data technologies in governmental procedures, leading to transparency, accountability, and effective service delivery to citizens.
- Policy Recommendations: Using the research findings, policymakers can devise specific strategies and measures to help them overcome the revealed issues and effectively use big data to meet e-government needs. This encompasses capital expenditure on technology utilization, skill development, and policy structures regarding using big data in administration.

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