

To Understand the Critical Measures of Enhanced Security in Cloud Computing for Creating Better Data Protection

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Abstract-Today, the use of cloud computing for better data protection has been increased to a great extent. One of the essential reasons for using cloud computing as a means of data protection is that users can easily access relevant data with the proper security protocols. However, various sectors such as healthcare, finance, automotive, education, manufacturing, etc. have experienced a lot of challenges regarding large and confidential data protection in the past few decades. With the advent of Cloud-computing in recent times, all the issues related to data security and information protection have been easier than before. Researchers have conducted an effective quantitative data collection approach by performing primary analysis through surveys. With a probability sampling technique, researchers have asked around 60 participants from different industrial fields about their opinions regarding the research topic. As per research findings around 60% of people have supported that cloud computing is essential for maximizing data protection. Around 30% people agreed with the 24x7 information monitoring and data encryption challenges can be solved with cloud computing. On the other hand, around 10% of participants have placed their positive opinion over the error reduction in data protection by using cloud computing. Researchers in this particular research paper are going to explain the importance of using cloud computing as a data security tool. In order to create better data protection systems across various industrial departments, cloud computing can be used in the future research as well.

Keywords- Cloud-computing, Data protection, survey analysis, Data security, Healthcare

I. INTRODUCTION

The modern world has experienced a lot of issues while managing proper data privacy and data security of various confidential resources. Data safety management is at once essential for any organization regarding its ethical branding

and strong imaging among the global markets. However, while engaging in online activities, users need to trust particular protocols for protecting their private data with delicate care [1]. For that reason, enormous organizations tend to apply numerous data safety practices through the efficient use of cloud computing. In order to show trust factors to their potential customers as well as users, cloud computing can at once help in protecting their private data from an effective perspective. As per the scientists, cloud computing can be highly accessed for processing better data availability as well as reliability [2]. It has been observed that by applying cloud-computing facilities, organizations can easily analyze and identify relevant data while accessing through virtual mediums from a large and confidential data set.

Nowadays, the growing belts of various industrial sectors around the world tend to focus on more data protection opportunities through using the merits of cloud computing to their neural network servers. Essential cloud computing services can at once offer users a sense of information dependability from a security perspective. Scientists have identified that by applying accurate security measures, safe application, information, and data access have become easier for potential users than before [3]. Various growing industrial sectors such as education, healthcare, finance, marketing, automotive, manufacturing, and other industries have experienced huge benefits of using cloud computing facilities while protecting confidential data [4]. Researchers are genuinely attracted to investigate the importance of cloud computing in various data protection aspects through a secure medium. Thus, users can be able to easily access important data immediately while accessing the Internet related to the particular research topic. Cloud computing services deal with innovative digital models for enhancing data privacy practices across a vast number of relevant

resources. However, these computing sources through storage, networks, and servers over the cloud can at once configure a secure way for protecting relevant confidential data [5]. Organizations after applying cloud computing facilities for data protection have witnessed relevant advantages. A wide network range can be safely aligned with the data protection mechanism available on the clouds for clients' safety [6]. The entire research thus focuses on conducting an effective analysis of the necessary advantages of using cloud computing for enhanced security measures in various industrial sectors across the globe. Moreover, researchers shed effective light on the implementation of cloud computing services for conducting better data privacy and protection across a large-scale data set.

II. LITERATURE REVIEW

According to Chentharra and co-researchers, protecting clients' data securely and undertaking critical security measures have become a relevant issue in the modern world of the industrial revolution [7]. Data protection with increased security measures have become a crucial factor in the process of cloud computing nowadays. The past few decades have seen potential challenges while protecting necessary company-related and clients' data that have questioned the ethical factors of the organization. For retaining brand image within this tough competitive market, organizations tend to apply various critical measures of increased security with the help of cloud computing services [8]. It has been observed that after utilizing cloud computing security techniques over security check-ups, the overall growth and efficiency of any organization can be exceeded to around 46% among enormous business activities [9].

Healthcare sectors have seen the positive use of cloud computing in managing patients' data history and record through cloud servers that help physicians in predicting future diagnosis practices. Basu and fellow researchers think, protecting various financial records is also essential in the stock-market industry, which also can be effectively conducted with the efficient use of cloud computing services [10]. Scientists have also identified that in various educational sectors, cloud computing can also help in protecting numerous academic data and students' records safely over the cloud. As per Domingo-Ferrer, in the case of automotive industrial belts, cloud computing also provides certain benefits in protecting private data securely [11]. Cloud computing can process data security and storage faster in automotive sectors from a better and safer point of view. Scientists have also identified that in the case of various manufacturing industries, the applications of cloud computing can at once mitigate potential risks related to data loss during the cost economy offering period to the potential users.

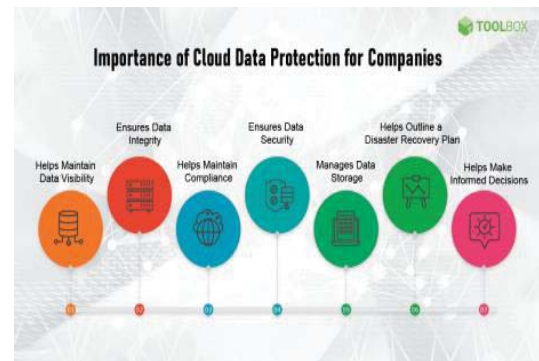


Fig. 1. Numerous benefits of cloud computing for advanced data protection and security (Source: [11])

The modern industrial world has witnessed relevant use of data protection towards enhanced safety measures with the critical implementation of cloud computing digital models. Cloud computing in various industrial sectors can at once offer a reliable way to safely access all the cloud information as well as applications for undertaking immediate action against any data privacy and security issues [12]. Through cloud computing servers, data privacy can ensure proper storage, network collecting, data transferring, and information sharing across the vast cloud. Mohammed opines organizations focus on implementing numerous cloud computing systems for maintaining the privacy of clients' and company's private data by avoiding data leaks or any risk of theft [13]. On the contrary, cloud computing can efficiently protect personal databases, confidential files, and financial accounts over a vast series of neural networks conducted from a remote place.

One of the effective reasons for using cloud computing in enhancing security measures is that it can maintain data sensitivity along with different regulatory compliance that is highly required for information protections to secure those resources. On the contrary, all the stored data over the cloud can be effectively encrypted from both ends while transiting over a large network [14]. Thus, cloud computing can efficiently combat potential issues of data exposure and information leakage. Researchers while conducting the study has also outlined that cloud computing can prevent any single data loss whenever the key security models fail to operate. Recent surveys and studies have also reflected that processing relevant access of confidential data over large sets of networks is highly crucial over the cloud in the modern economic world [15]. Apart from this, cloud computing can also provide organizations with certain competitive benefits by controlling all the privileges of the potential users. On the other hand, by confirming the proper identity of the users over a large dataset, cloud computing can at once protect important data from damage and can be safely kept across the cloud servers.



Fig. 2. Various critical data security challenges analyzed by cloud computing (Source: [15])

Worldwide industrial belts in recent times have identified that data security and protection of confidential information are two fundamental factors of establishing trust between the customers, users, and the organizations [16]. However, cloud computing uses an information security subset for keeping all the private information safe and secure. Sun has determined heavier dependency of users over cloud computers, which can at once mitigate potential threats related to the stored data over the clouds [17]. On the other hand, cloud computing services can allow users to access relevant data even after it was lost due to the failure of the system. Besides, in the case of data corruption due to any computer virus attack, cloud computing also offers necessary benefits to the users to access valid information from a large cloud dataset. Along with this, deleted, manipulated, or altered data by any hacker also can be effectively recovered with the merits of cloud computing subsets towards enhanced data security.

After analyzing all the survey outcomes, researchers are going to evaluate the importance of maintaining data security by the utilization of cloud computing. Cloud computing offers encryption that aid in confidential data privacy over a clouded network [18]. With the use of cloud computing tools, data security nowadays has become a more sensitive factor for organizations towards protecting confidential information from any malicious threats. After asking around 60 industrial participants relevant questions regarding the topic, researchers have potentially identified that cloud computing can help companies in protecting all their important accounts, personal data, and workloads from being attacked by any unauthorized external access. Moreover, cloud computing data security techniques also offer users strong encryption for major data management. Moreover, researchers in this specific research also have concentrated on investigating the impacts of cloud computing for better data protection scopes in the sustainable future.

III. RESEARCH METHODOLOGY

Researchers for understanding numerous advantages and contributions of cloud computing in security reasons have asked questions through performing various online surveys among 60 potential participants. After examining three topic-based questions and answers, researchers tend to analyze all the survey outcomes based on the participants' choices. Researchers have inspected all the gathered responses from various industrial belts such as finance, automotive, healthcare, manufacturing, and education. Through conducting a probability sampling technique, all their opinions of them were collected and examined regarding the

utilization of cloud computing in enhanced data safety and data privacy aspects.

However, by applying quantitative data gathering methods, researchers have identified beneficial impacts of cloud computing for processing better data protection factors throughout the research. On the other hand, to get a clear understanding of the proper knowledge of the participants regarding cloud computing security measures, questions have been asked to collect relevant judgments from around 60 participants. After gathering all the opinions from the representatives of various industrial sectors, researchers have successfully evaluated all the survey results from an effective perspective. However, for comprehending the endowments of cloud computing in more advanced data protection effectively, researchers have demarcated relevant research questions related to the particular research topic from a positive point of view-

What are the advantages of using cloud computing for more advanced data security and data protection measures?

How can global industrial organizations receive accurate data protection and data safety assurance after implementing cloud computing facilities within the organizational structure?

IV. ANALYSIS AND INTERPRETATION

Survey Questionnaire:

Q1. Will cloud computing techniques be utilized to protect confidential data and enhance security measures?

TABLE I. INCREASED DATA CONFIDENTIALITY AND PROTECTION RATE MEASUREMENT BY USING CLOUD COMPUTING SERVICES (SOURCE: CREATED BY THE RESEARCHERS)

Options of the participants	Overall Participants	Collected Response	Percentage
Agreed Strongly	60	25	41.67
Supported	60	17	28.33
Remained Neutral	60	8	13.33
Disagreed	60	6	10
Disagreed Strongly	60	4	6.67

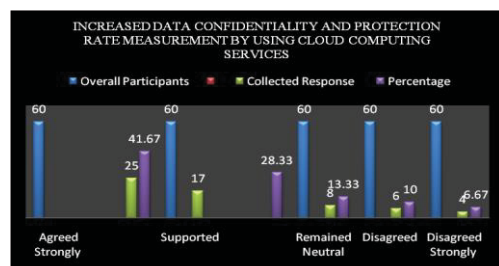


Fig. 3. Increased data confidentiality and data security rate measurement through applying cloud computing (Source: Created By the Researchers)

After analyzing all the survey outcomes from 60 potential participants, the above graph of the first survey question at once shows that almost 41.67% of people have strongly agreed. On the other hand, there can be traced 28.33% of participants who supported to the particular survey question. However, from the graph, it has been also analyzed that

almost 13.33% of the people remained neutral during the conduction of the survey topic. On the contrary, around 10% of the participants have disagreed with the survey question. In contrast to that, almost 6.67% of the people strongly avoided the validity of the particular research question. Numerous key gaps among percentage calculation of the relevant factors have been minutely examined from the calculation graph.

Q2. Do you support cloud computing facilities can monitor 24x7 visibility of data by encrypting from both ends for further investigation scopes?

TABLE II. 24X7 DATA VISIBILITY AND ENCRYPTION RATE CALCULATION BY UTILIZING CLOUD COMPUTING TECHNIQUES (SOURCE: CREATED BY THE RESEARCHERS)

Participants' options	Total Participants	Response Gathered	Percentage
Strongly Supported	60	19	31.67
Agreed	60	13	21.67
Neutral	60	10	16.66
Disagreed	60	16	26.67
Strongly Disagreed	60	2	3.33

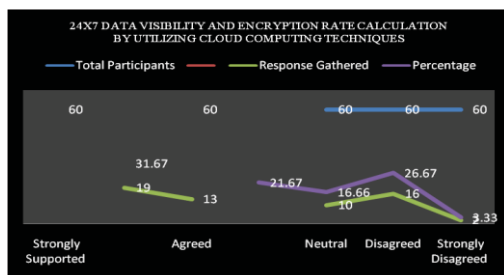


Fig. 4. 24x7 data visibility and encryption security rate calculation through using cloud computing

(Source: Created By the Researchers)

Researchers, after investigating the second survey question-related graph, have observed that among 60 participants, almost 31.67% of people have strongly supported the reliability of the second survey question. However, it has been evaluated that around 21.67% of the participants have provided positive answers regarding the survey question. On the contrary, only 16.66% of the people neither agree nor disagree with the validity of the topic-based question. On the other hand, almost 26.67% of the participants did not support the second survey question. Moreover, only 3.33% of the people have strongly avoided their perspective and reliability of the particular survey question. Effective measurement gaps from the top to the bottom have been also analyzed throughout the calculation table from an effective perspective.

Q3. Do you agree that the proper utilization of cloud computing services can be beneficial in reducing error percentages during data protection and privacy practices?

TABLE III. MEASUREMENT OF ERROR REDUCTION RATE IN DATA PROTECTION PRACTICES BY APPLYING CLOUD COMPUTING FACILITIES (SOURCE: CREATED BY THE RESEARCHERS)

Options	The overall	Response	Percentage
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Provided to the participants	number of Participants	Collected	
Strongly Agreed	60	27	45
Supported	60	12	20
Remained Neutral	60	6	10
Disagreed	60	11	18.33
Disagreed Strongly	60	4	6.67

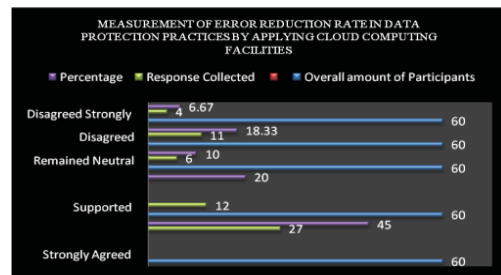


Fig. 5. Error mitigation rate calculation in data protection and privacy by utilizing cloud computing

(Source: Created By the Researchers)

Researchers from the calculation graph, have identified among 60 participants, there are around 45% of people have strongly agreed with the question regarding the third survey analysis. On the other hand, around 20% of the participants have genuinely supported the answer to the third question. However, it has been traced that almost 10% of the potential participants remained silent and did not help during the survey by providing an answer to the question. In contrast to that, around 18.33% of the people disagreed with the particular third question. Besides, around 6.65% of the people strongly disagreed with the survey topic. Moreover, differences in the percentage calculation table are evident based on the survey analysis from the table.

V. DISCUSSION AND FINDINGS

Researchers, after analyzing the collected responses regarding the first survey question, have effectively examined participants' viewpoints over the effective utilization of cloud computing in the fields of data protection and enhanced security. Researchers have traced that global organizations tend to focus more on the efficient protection of confidential data against the attacks of DDoS through applying cloud computing facilities. As per Li and co-researchers, cloud computing also can provide users with relevant online sources available safely across the vast servers of the cloud [19]. After analyzing the survey outcomes of the first question during the pandemic, researchers have concluded that the utilization of cloud computing services in various industrial belts can enhance data security measures more efficiently across the globe.

However, researchers have identified that most people have no clear idea about the use of 24x7 data visibility and encryption security through cloud computing. From the analysis of the second survey results, it has been proved that cloud computing can effectively adopt data security controls by its relevant applications over big data analysis. However, by incorporating data security techniques, cloud computing services can at once identify the significance of protecting various large and confidential datasets.

The third survey results help researchers to identify all the beneficial use of cloud computing for reducing errors in data protection practices. Scientists can consider the practices of proper data protection through the applications of cloud computing in various industrial sectors. Cook thinks data protection through cloud computing can be highly beneficial for global companies regarding the issues of safety violations and data breaches [20]. Moreover, data threat detection, continuous information monitoring, and protecting relevant data from risks have become more uncomplicated today with the accurate applications of cloud computing services.

All the survey-related responses have been gathered through a detailed investigation of virtual binary options. Researchers show extreme interest in collecting relevant perspectives of the participants regarding the research topic. It is important to analyze all those collected primary data to learn the effective benefits of using cloud computing in data protection practices towards more beneficial future scopes. In order to comprehend the contributions of cloud computing in enhanced security purposes, researchers have regulated topic-oriented online surveys during the global pandemic period.

VI. CONCLUSION

The modern-day industrial sectors have witnessed positive growth and demand in applying cloud computing services for better data security management. After analyzing the overall research topic and surveys, researchers can conclude that while practicing data privacy and security aspects, cloud computing can provide utter benefits to industrialists across the globe. Cloud computing can offer 24×7 data visibility to the users so that relevant data can be accessed while necessary. On the other hand, higher data availability from a secure perspective also can be attained through the use of cloud computing.

However, while researching the use of cloud computing in data protection, researchers have performed numerous surveys to understand participants' opinions over the particular research topic. Therefore, researchers reflected an utter interest in analysing the use of cloud computing techniques for data security, advanced detection of threats, and compliance regulatory measures to a great extent for a sustainable future.

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