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A STUDY ON CLOUD COMPUTING SECURITY CHALLENGES IN BUSINESS ORGANIZATIONS

Prof. Bhaskara Reddy A
Assistant Professor, Department MCA, Nagarjuna Degree College, Bengaluru
ORCID iD: 0009-0000-0527-8528

ABSTRACT

Cloud computing is one of the fastest emerging technologies in computing. There are many advantages as well few security issues in cloud computing.The cloud problems are mainly with the security and privacy of the data stored in the cloud. The literature has found few gaps such as; there is limited number studies has conducted on employee's attention, organizational context and culture and there is scarcity of research works on organizations readiness for adoptions Cloud Security compliances. In this regards the study aims to identify the major cloud security challenges faced by business organizations in Bengaluru city of Karnataka. The hypothesis of the study is H1 there are significant cloud security challenges faced by the business organizations.The study adopted descriptive research design, the primary data was collected through structured questionnaire from the 106 purposive samples consists of professionals involved in cloud computing, IT managers and information security managers. The secondary data collected through google scholar data base. It is concluded that the factors measured in the study are statistically significant and are positively perceived by the respondents. These findings validate the importance and relevance of the study variables and provide empirical support for the proposed research framework.

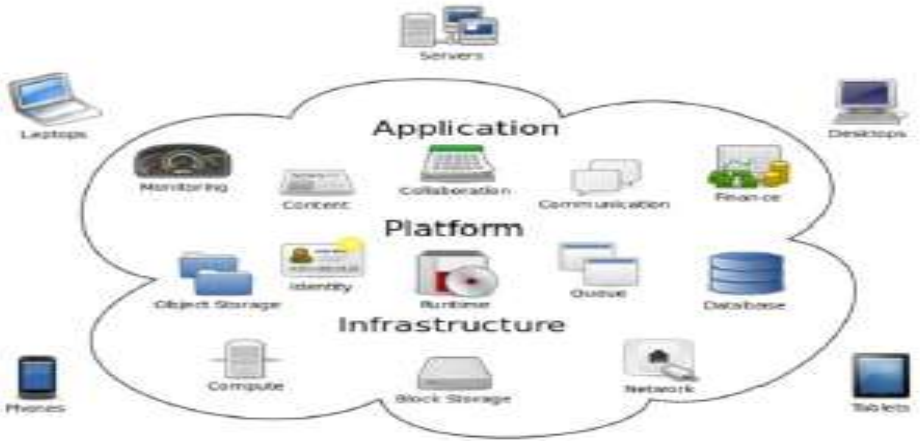
KEYWORDS; *Cloud Security, AI, Cloud computing and data security*

INTRODUCTION

Cloud computing is quickly becoming pervasive in today's globally integrated networks. The cloud offers organizations opportunities to potentially deploy software and data solutions that are accessible through numerous mechanisms, in a multitude of settings, at a reduced cost with increased reliability and scalability Computing in the Cloud is a relatively new notion that offers several advantages to the people who utilize it (George Grispos et al., 2013), Cloud computing presents serious security risks that require careful attention, despite its many advantages such as scalability, cost-effectiveness, and flexibility. Currently cloud computing is used directly or indirectly in many businesses and if any data breaching has happened in cloud computing, that will affect the cloud computing as well as the company's business. This is one of the main reasons for cloud computing companies to give more attention to data security. Cloud computing is one of the fastest emerging technologies in computing. There are many advantages as well few security issues in cloud computing. The cloud problems are mainly with the security and privacy of the data stored in the cloud. The cloud environments like heterogeneity, resource sharing, multi-tenancy, virtualization, mobile cloud computing and Service Level Agreement (SLA) that makes the cloud security more vulnerable (P. Ravi Kumar et al., 2018).

Many business institutions are moving towards the cloud computing due to the efficiency of services and pay-per-use pattern. This pay-per-use pattern based on the resources consumption e.g. processing power, transactions carried out, bandwidth consumed, data transferred, or storage space occupied etc (Sandeep Kelkar 2015).

Structure of Cloud computing



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REVIEW OF LITERATURE

Kuyoro S. O. (2011), there are many new technologies emerging at a rapid rate, each with technological advancements and with the potential of making human's lives easier. Rabi Prasad Padhy et al., (2011), as the development of cloud computing technology is still at an early stage, Data security is major issue for Cloud Computing. There are several other security challenges including security aspects of network and virtualization Rajesh Piplode & Umesh Kumar Singh (2012), Cloud computing is a promising technology to facilitate development of large-scale, on-demand, flexible computing infrastructures. But without security embedded into innovative technology that supports cloud computing, businesses are setting themselves up for a fall.

Venkata Koteswara Rao Ballamudi & Harshith Desamsetti (2017), the two areas of most significant concern regarding cloud computing security are storage and networks. Cloud computing users have a substantial issue regarding virtualization, making it possible for several users to share a single physical server. Sachin Kumar Singh & Devendra Kumar Singh (2017), the cloud has been widely hailed as the most disruptive force in modern business. Indeed, the world is in the midst of fundamentally profound transformations, enabled by the cloud, in the ways in which we access and interact with data and applications. Hardial Singh (2017), Continuous audits are becoming fundamental to improving an organization's cloud security posture. Unlike traditional periodic assessments, continuous audits leverage automated tools and real-time monitoring to provide an ongoing evaluation of security controls and compliance status Abdullah Aljumah & Tariq Ahamed Ahanger (2019), cloud computing systems are prone to multiple attacks and hacking attempts that can majorly harm cloud computing service providers. Hackers are adopting innovative approaches to damage highly secured systems through malicious attacks.

Zina Balani & Hacer Varol (2020), the most critical of the cloud computing issues is security. Users do not have enough trust to upload their data into clouds across the network. Narendra Rao Tadapaneni (2020), many security experts are working on finding better security solutions. Even though security is getting better day by day but still hackers are finding ways to exploit a particular cloud. The Cloud security concern becomes more complex below the cloud model as many other fields continuously enter the Cloud computing industry. Marya Ayoub Omer et al., (2022), the cloud still faces many security challenges. That's why the cloud's greatest challenge is stability. Despite bringing many benefits, the cloud also faces several security challenges. That's why stability is the cloud's biggest problem. Janet Julia Angudi (2023), the multi-faceted nature of security threats, from traditional data breaches to emerging threats like serverless architecture vulnerabilities, necessitates a comprehensive and adaptive security strategy.Anamika Agarwal et al., (2023), most cloud service providers automatically follow the best security practises and actively protect the operation of their systems. Enterprises are required to independently judge the security of their data, apps, and the cloud's workload.

L. Ertaul et al., (n d), Security is as much of an issue in the cloud as it is anywhere else. Different people share different point of view on cloud computing. Some believe it is unsafe to use cloud. Cloud vendors go out of their way to ensure security. Abdullah Aljumah & Stavros Shiaeles (2023), Cloud security frameworks are created to assist organizations in understanding their vulnerabilities when building cloud infrastructure. Cloud security issues offer substantial concerns for organizations that use cloud computing services. These issues, however, may be efficiently managed with proactive steps and solid security systems.

Based on the above reviewed research works the study has finds few gap such as; there is limited number studies has conducted on employees attention, organizational context and culture and there is scarcity of research works on organizations readiness for adoptions Cloud Security compliances. In this regards the study aims to identify the major cloud security challenges faced by business organizations in Bengaluru city of Karnataka. The hypothesis of the study is H1 there are significant cloud security challenges faced by the business organizations.

RESEARCH METHODOLOGY

The study adopted descriptive research design to identify the major cloud security challenges faced by business organizations and to examine the relationship among cloud security variables and organizational security effectiveness in Bengaluru city of Karnataka. The primary data was collected through structured questionnaire from the 106 purposive samples consists of professionals involved in cloud computing, IT managers and information security managers. The secondary data collected through google scholar data base.

ANALYSIS AND INTERPRETATION OF DATA

Table;01, Major cloud security challenges faced by business organizations in Bengaluru city of Karnataka

Table;01 Descriptive Statistics

Challenges	N	Mean	Std. Deviation	Kurtosis		Std. Error Mean
	Statistic	Statistic	Statistic	Statistic	Std. Error	
Data Privacy	106	1.7170	.78987	1.252	.465	.07672
Data Breaches	106	1.8585	.86673	1.285	.465	.08418
Identity & Access Management	106	1.6792	.69758	3.559	.465	.06775
Insider Threats	106	1.8491	.84844	1.650	.465	.08241
AI based Threats	106	1.7453	.67699	.935	.465	.06575

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Employees Security knowledge	106	1.7925	.59709	-.390	.465	.05799
Regulatory Compliance	106	2.1132	.84313	-1.008	.465	.08189
Cloud miss configuration	106	1.9717	.73624	-.263	.465	.07151
Poor Response capability	106	1.8208	.88153	-.266	.465	.08562
Vendor Lock in	106	1.9340	.81963	-.287	.465	.07961

Source; Primary data

The table number 01 discusses the major cloud security challenges faced by business organizations in Bengaluru city of Karnataka. The analysis based on 106 samples (N) which is sufficient to conduct descriptive analysis. The values for all 10 chosen variables is range from 1.679 to 2.113 which signifies that respondents were experienced the listed challenges in their day to day working life. Among the considered variables the challenges 07 (Regulatory Compliance) got the mean score of 2.113 as most significant challenge, the least experienced defy is the third (Identity & Access Management) challenge with mean score of 1.679. The SD values range from 0.597 to 0.882 indicates moderate in the response ratio. Employees Security knowledge exhibited the most consistency among all the variables with a SD score of 0.597.

The Kurtosis values range from -1.008 to 3.559, the values in between -1 to +2, shows that the distributions are reasonably close to each other. Identity & Access Management has Kurtosis value of 3.559. The first five challenges got positive Kurtosis values while reaming last six got negative score. It is interpreted that, responses were more evenly spread across the scale. The Stand error of mean starts from 0.058-0.086 is low for all the variables which means samples are part of the total population.

Over all the descriptive statistics suggest that, Regulatory Compliance, Vendor Lock in andCloud miss configuration are the more significant issues and the chosen variables are reliable and practically challenges faced by the professionals in cloud computing, IT managers and information security managers.

HYPOTHESIS OF THE STUDY

Hypothesis of the study is H1 there are significant cloud security challenges faced by the business organizations.

Table;02, One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
Challenges	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Lower**	**Upper**
Data Privacy	22.380	105	.000	1.71698	1.5649	1.8691
Data Breaches	22.077	105	.000	1.85849	1.6916	2.0254
Identity & Access Management	24.784	105	.000	1.67925	1.5449	1.8136
Insider Threats	22.438	105	.000	1.84906	1.6857	2.0125
AI based Threats	26.542	105	.000	1.74528	1.6149	1.8757
Employees Security knowledge	30.907	105	.000	1.79245	1.6775	1.9074
Regulatory Compliance	25.805	105	.000	2.11321	1.9508	2.2756
Cloud miss configuration	27.572	105	.000	1.97170	1.8299	2.1135
Poor Response capability	21.265	105	.000	1.82075	1.6510	1.9905
Vendor Lock in	24.293	105	.000	1.93396	1.7761	2.0918

Source; Primary data

The table 02 describe the results of one sample T test, the p value for 10 chosen variables (sig. 0.00) less than 0.001, signifies the mean value for all variables are statistically significantly different from 0. The T value is start from 21.265 to 30.907 shows strong evidence against the null hypothesis, with 95% of confidence and 5% for margin of error. The result indicates that (t= 21.265 to 30.907, df is 105, P < .001) confirming that respondents are significantly positive percention across all the chosen variables. Hence all the significant values are less than 0.05 (P < .001) the studies have rejected the null hypothesis and accept the alternative hypothesis. The findings support alternative hypothesis which indicate that the constructs examined are significantly present among the respondents of the study.

CONCLUSION

The combined finds from Descriptive Statistics and One-Sample Test demonstrates that, the respondents consistently expressed significant positive opinions regarding the considered valuables which providing strong statistical evidence that the observed mean differences are significant rather than due to random variation.Concluding that the factors measured in the study are statistically significant and are positively perceived by the respondents. These findings validate the importance and relevance of the study variables and provide empirical support for the proposed research framework.

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