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THE IMPLEMENTATION OF CLOUD COMPUTING AS STRATEGIC TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT USING REGRESSION ANALYSIS

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Abstract
As information technology has advanced, there has been a shift toward relying more and more on online cloud storage and computing services. There is no getting around the fact that recent times have seen a meteoric rise in interest in cloud computing. This technology is used by many different organisations as the central component of their information technology infrastructure. The use of cloud computing results in increased data processing efficiency across a variety of computer and storage systems that are available over the internet. The approaches have advanced as a direct result of the cutting-edge and forward-thinking computer procedures that are the foundation of the internet's core database and network architecture. In the 1990s, a new sort of cutting-edge computing known as grid computing came into being. 2005 saw the birth of two new computing paradigms: cloud computing and utility computing. Consolidating several virtual computing components into a single physical platform is one of the most distinguishing features of cloud computing services and infrastructure. These components include the central processing unit (CPU), the network, storage, and memory. A piece of software known as a hypervisor is responsible for isolating each virtual machine (VM) (used by Virtual box and VMware, for example). Using this strategy, one virtual disc or machine may be prevented from directly accessing the memory and programmes of another inside the same environment. This can be accomplished by using a firewall. Through the use of hardware abstraction, it is feasible to conceal the complexity of operating physical computer systems, while at the same time efficiently boosting the systems' processing capacity. Utilizing virtualization technology in the cloud comes with a number of benefits, including scalability and the capacity to support many tenants (one software programme serving many users at once). These properties are essential to cloud computing because they make sharing and pooling resources possible. Sharing and pooling resources provides a number of benefits, some of which include increased business value, more flexibility, and cost savings.
When it comes to the process of moving assets from cloud providers to cloud virtualization users, provisioning is an extremely important step. In order to fulfil the requirements of its clientele, the cloud service provider must create an acceptable number of virtual machines and make available sufficient amounts of resources. This may be accomplished by any one of the following three methods: advanced provisioning, dynamic provisioning, or user self-provisioning. The mechanism by which cloud services and resources are made available, known as dynamic provisioning, faces a number of challenges. These challenges include the correct configuration of virtual machines (VMs) and technological constraints such as disc space, processing power, memory, and network throughput. It's possible that the scalability of virtual machines, the setup of cloud systems, and other aspects of virtualization's deployment might provide some difficulties.
Keywords*: Cloud Computing, Sustainable development, Perceived valued, Regression analysis*

Introduction

Because of the lightning-fast rate at which technological progress is being made, it is very necessary for the modern financial institutions to use machine learning solutions. They play a significant role

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in risk management by using safeguards in the process of identifying, analysing, reporting on, and ultimately resolving concerns (Financial Stability Board, 2017). As a direct consequence of this, academics have started looking at how the proliferation of machine learning algorithms might impact the conventional approaches to risk management in the banking industry. The prediction made by Leo et al. (2019) that there would be a significant shift in the way banking risk management is handled over the course of the next decade is illustrative of this point. The emergence of new threats, modifications to existing regulatory frameworks, and altering expectations on the part of consumers are all being mentioned as causes for the future alterations in risk management tactics. It is to be anticipated that the use of cutting-edge technology and analytical tools will have an impact on the traditional processes of developing new goods, delivering services, and managing risks. Machine learning is used as an example by Leo et al. when they are addressing technological applications that might potentially alter risk models (2019). For example, the capacity of machine learning to recognise complex, non-linear patterns in data may contribute to the improvement of the accuracy of risk models. If, for example, a larger amount of data was utilised and integrated across a wide variety of banking risk sectors, then maybe better prediction models might be constructed. Arguments presented in the paper encouraged research into how machine learning may be used by financial organisations to risk management.

The utilisation of hosted internet services is often described using the phrase "cloud computing," which was coined in 2005. (Markovic et al., 2013). The National Institute of Standards and Technology (NIST) in the United States defines "cloud computing" as "ubiquitous, convenient, and on-demand network access to a shared pool of configurable computing resources (such as networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or interaction from service providers" (Mell and Grance, 2011). Cloud computing makes it possible to add new capabilities to an organisation in response to its specific needs without the need to make further investments in its infrastructure, software, or personnel (SIclovan, 2012). The term "cloud computing" refers to a relatively new form of information technology that enables businesses to gain a competitive advantage in the market by virtue of the inherent characteristics of the technology itself. These characteristics include the ability to be agile, flexible, and scalable; simple and secure accessibility from anywhere; growing reliability; growing fault tolerance; and cost-effectiveness. Cloud computing is defined by the National Institute of Standards and Technology (NIST) and the International Organization for Standardization (ISO/IEC 17088) as having the following primary characteristics: on-demand self-service, broad network access, resource pooling, rapid elasticity, quantifiable services, and multi-tenancy (Alsaeed and Saleh, 2015). Because of cloud computing, a number of different service models are already accessible. Some examples of these models are IaaS, PaaS, and SaaS. (Mell and Grance, 2011, Rimal et al., 2009, Sharma and Banga, 2013, Tayal, 2011). Organizations that are interested in using cloud computing have many deployment options to choose from, including private clouds, community clouds, public clouds, and hybrid clouds (Fig. 1). This was shown by a large number of scholars very lately (Adrees et al., 2015; Yaghmaei and Binesh, 2015).

It is essential for companies to move their outdated software and services to the cloud in order for them to take benefit of cloud computing (Babar and Chauhan, 2011). Migration to the cloud should be carefully considered as a potential business strategy by organisations. Research is being carried out in this area with the intention of making it simpler for companies to make the shift from using services that are hosted on their own premises to those that are hosted in the cloud. It would be beneficial for many businesses to invest in cutting-edge technology such as cloud computing so that they may focus more on their essential operations and their prospects for future expansion. If companies want to effectively use cloud computing and relocate their operations there, they will need to shift their attention from the ownership of infrastructure to the supply of services (Rewatkar and Lanjewar, 2010).

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As a result of the wide variety of cloud services and alternatives that are now accessible, selecting the optimal cloud infrastructure configuration, service, and provider may be challenging (such as location, sales model, repeatability, etc.) To cite: (Garca-Galán et al., 2016). As a consequence of this, there is a need for a framework that will assist in directing decision-makers and carrying out an effective migration. The great majority of research endeavours make use of Decision Support Systems (DSS), which are primarily centred on the process of picking a cloud service provider and were developed expressly for cloud migration. They placed an emphasis on cost, but neglected to carry out a comprehensive investigation into the underlying factors that led to the widespread exodus. In addition to selecting a provider, businesses should spend some time becoming acquainted with the characteristics, tenets, and regulations associated with cloud computing.

Review of Literature

Quite a few technology acceptance models that are now in widespread use have been established in order to better understand the elements that impact user information and communications technology adoption, usage, and behaviour in enterprises. Fishbein and Ajzen's The Theory of Reasoned Action is an example of a book in this category (TRA). This widely accepted hypothesis suggests that beliefs about the significance of a certain behaviour have a positive connection with that behaviour and act as a predictor of that behaviour. As an additional perk, the views of others around a person are often influential in determining whether or not they are interested in embracing a new technology innovation. Ajzen established the Theory of Planned Behavior by expanding the TRA model with the notions of control beliefs, perceived ease of use, and behaviour control. This was done in order to explain why people do the things they do (TPB). Beliefs are categorised as either "behavioural," "normative," or "control" according to this method's central tenet, which is called "behavioural intention." The relationship between acceptance, adoption, and readiness to use a particular piece of technology was then described with the help of the Davis technology acceptance model. (TAM). According to TAM, the two most important aspects in the technology adoption process and the utilisation of systems are the perceived utility of the technology and the perceived ease of using the technology. According to TAM, "beliefs and evaluations," such as how useful something is and how simple it is to use, impact attitude, which then affects use intention and, lastly, actual behaviour. Some examples of these beliefs and assessments include:

TAM is a model that is generally acknowledged for explaining the processes of ICT adoption and use, and it has been utilised extensively in research on the topic of technology adoption in the context of a corporate environment. TAM consistently explains a major portion of the variation in consumers' intentions to use a broad range of ICT, regardless of the environment or country in which the research was conducted. Since its introduction, the TAM model has been the focus of a significant amount of study, which has resulted in the construction of a large number of versions. Some of the most significant advancements in the field of technology acceptance and user satisfaction include the TAM 3 model, which was proposed by Venkatesh and Bala in the field of e-commerce, and the Unified Theory of Acceptance and Use of Technology (UTAUT), which was, for example, applied to mobile applications. TAM has been used in a broad variety of contemporary IT research initiatives to shed light on the factors that have led to the widespread adoption of various technologies, in addition to cloud computing. The great majority of these models improve upon the fundamental structure of the original TAM by including additional factors from the outside environment that are thought to be relevant. Because of this, it is often used in research pertaining to topics such as e-commerce, file digitization systems, Internet banking, mobile social gaming, and e-learning platforms, amongst a great deal of other topics.

The adoption of technological innovations is dependent on three interrelated factors, according to the TOE (Technology-Organization-Environment) framework. These factors are the internal resources and characteristics of the organisation, the environment in which the organisation operates, and the technological context. This method focuses on how companies make use of a

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product or service rather than analysing how consumers put it to use in their daily lives. To this day, the TOE model has shown itself to be one of the most widely accepted theoretical explanations for the proliferation of ICT. It includes an in-depth examination of technical breakthroughs and the uses of those advancements, as well as forecasts for how these trends will affect value chain activities and the resultant spread of variables that influence business choices. Nevertheless, the construction of the TOE might have at least two flaws: The underlying structures of TOE are not entirely apparent, and the research found conflicting results about the particular components that were observed in each of the three different examples. Some studies combine aspects of the TAM model with the TOE framework, and the findings of these studies indicate that technical and organisational variables influence how users perceive the ease of use and usefulness of the technology, while environmental factors have a more direct impact on how widely it is adopted. There are current research in the field of information systems that make use of TOE; many of these studies complement the TAM model, as will be shown in the next part. These studies may be found, and they will be presented, in the following section. Websites, Internet use, business systems in SMEs, e-commerce, e-business in developing countries, and many other topics are examples of things that have been studied and documented in the literature.

Methodology

Following an analysis of the numerous frameworks and theories that were utilised in the numerous studies on the adoption of technology, the TAM was chosen to be utilised in the current study. However, some modifications were made to the model in order to account for additional external factors that were thought to be particularly pertinent for the study that was being conducted. The selection of TAM is validated by a substantial amount of earlier research that demonstrates the usefulness of this framework for comprehending the processes of ICT adoption and utilisation. As a result, writers are permitted to make use of pre existing grading systems that have been proven several times in the relevant scientific literature. Due to the fact that they have been put through extensive testing, the core parts of the TAM model, which describe attitudes about the use of technology, may be utilised in the context of cloud computing with complete peace of mind. In accordance with the TAM model, there is a connection that may be attributed to causation between an individual's PU, PEOU, ATU, and BI (BIU). The levels of past behaviour while using that technology (BIU) are a reflection of the levels of prior behaviour towards the adoption of technology (ATU). As a result, the structure of the ATU symbolises the adoption of a favourable or unfavourable attitude toward an invention, and it has a direct influence on the BIU. Since it is a commonly held belief that intentions come before behaviours, including BIU as a mediating variable into the model is absolutely necessary in order to improve its capacity for prediction. A person's PU may be defined as the confidence they have in the success of a certain tactic. The degree to which users have faith that the technology would enable them to carry out their responsibilities more effectively inside an organisation would be reflected by this metric. On the other hand, perceived effort of use, often known as PEOU, is a measurement that determines how simple a person considers a system to be.

Data Analysis

Table 1: Demographic analysis

Demographic	Particulars	Frequency	Percent
Gender Category	Male	92	67.20
	Female	45	32.80
Age Category	Less than 30 years	37	27.00
	31 - 40 years	52	38.00
	41 - 50 years	17	12.40
	Above 50 years	31	22.60
Typeoffamily	Joint family	59	43.10
	Nuclear family	78	56.90
Currently living in	Metro City	82	59.90
	Non-metro City	55	40.10
Management Cadre	Lower-level management	40	29.20
	Middle level management	82	59.90
	Process Head	15	10.90
Total experience	Less than 3 years	35	25.50
	4 - 8 years	35	25.50
	8 - 12 years	26	19.00
	12 - 16 years	9	6.60
	Above 16 years	32	23.40

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According to the above analysis, male respondentss accounted for 67.20 percent of the population, while women made up 50 percent of the total population. There were 38.00% of the population who were younger than 30 years old, 27.00% of those who were older than 50 years old, and 50.00% of the population who were between the ages of 41 and 50. In addition, 59.90% of people now live in a metropolitan region, while the remaining 40.10% live in a non-metropolitan area; and 56.90% of people belonged to a nuclear family, while the remaining 40.10% belonged to a joint family. The remaining 29.20 percent were either in middle management or lower management, while the remaining 59.90 percent were process heads.

Regression analysis

Table 2: Regression analysis

Variables	B	t	P Coeff.
(Constant)	0.187	0.95	0.344
Management Support	0.374	3.471	0.001
Perceived Usefulness	0.471	4.504	0.00
Cost Effective	0.045	0.503	0.616
F Value	132.389		
R Squared	0.749		

According to Table 2, it is noted that the coefficient of determination is 0.749 which shows the model is good fit, furthermore the regression equation is stated as Y (Cloud computing as strategic technology) = 0.187 + 0.374 x Management Support + 0.417 x Perceived Usefulness + 0.045 x Cost Effective

Chi square test for hypothesis

The last step in the data analysis is to understand the critical association between independent variables and dependent variable

Hypothesis 1

Null: There is no statistical difference between management support and Cloud computing as strategic technology

Table 3: Cross tabulation between management support and Cloud computing as strategic technology

	Cloud Computing as strategic tech				
Management Support	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Strongly Disagree	2	5	0	0	0
Disagree	1	10	2	0	0
Neutral	0	0	14	2	4
Agree	0	0	1	9	30
Strongly Agree	0	0	0	12	45
Chi-Square Tests	Value	df	P Coeff		
Pearson Value	207.458a	16	0.00		
Likelihood value	160.835	16	0.00		

From table 3, it is noted that the p value is 0.00 which is > 0.05 and hence the null hypothesis is rejected, therefore it is concluded that there is a statistical difference between management support and Cloud computing as strategic technology.

Hypothesis 2

Null: There is no statistical difference between perceived usefulness and Cloud computing as strategic technology

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Table 4: Cross tabulation between perceived usefulness and Cloud computing as strategic technology

	Cloud Computing as strategic tech				
Perceived Usefulness	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Strongly Disagree	1	6	0	0	0
Disagree	6	5	2	0	0
Neutral	0	0	11	3	6
Agree	0	0	1	9	30
Strongly Agree	0	0	0	2	55
Chi-Square Tests	Value	df	P Coeff		
Pearson Value	211.843a	16	0.00		
Likelihood value	159.453	16	0.00		

From table 4, it is noted that the p value is 0.00 which is > 0.05 and hence the null hypothesis is rejected, therefore it is concluded that there is a statistical difference between perceived usefulness and Cloud computing as strategic technology.

Hypothesis 3

Null: There is no statistical difference between cost effective and Cloud computing as strategic technology

Table 5: Cross tabulation between cost effective and Cloud computing as strategic technology

	Cloud Computing as strategic tech				
Cost Effective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Strongly Disagree	3	4	0	0	0
Disagree	5	6	1	1	0
Neutral	0	0	13	1	6
Agree	0	0	1	20	19
Strongly Agree	0	0	2	22	33
Chi-Square Tests	Value	df	P Coeff		
Pearson Value	185.355a	16	0.00		
Likelihood value	143.357	16	0.00		

From table 5, it is noted that the p value is 0.00 which is > 0.05 and hence the null hypothesis is rejected, therefore it is concluded that there is a statistical difference between cost effective and Cloud computing as strategic technology.

Conclusion

One of the most significant developments to take place on the internet in the last several years is cloud computing technology, which has been a game-changer for information management systems. The purpose of the current research is to investigate the elements that influence the adoption process, which is neither simple nor fast, particularly for businesses. The paradigm that is going to be given here was built after an exhaustive analysis of the previous research that was done on IT adoption models. In addition to taking into account the other factors, it considers TAM. Businesses are able to boost their agility and efficiency with the help of innovative solutions such as cloud computing, which in turn enables them to take the essential steps toward building and sustaining a sustainable competitive advantage. The use of the infrastructure and services provided by the cloud is required for contemporary enterprises. The relocation of a company's operations to the cloud is a complicated and ever-evolving strategic decision. When a company is making modifications or improvements to its current infrastructure, it is imperative that they keep cybersecurity considerations in mind. An intrusion detection and prevention system is one of the most prevalent types of software used for the purpose of providing protection against cyberattacks. Since the infrastructure is situated away from the user's premises, it is possible that delegating responsibility

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for data protection and safety to the cloud service provider would mitigate some of the dangers connected with using cloud computing.

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