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COVID-19 and the Level of Cloud Computing Adoption: A Study of Sri Lankan Information Technology Organisations

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Abstract
The study's main objective is to analyse the level of cloud computing adoption and usage during COVID-19 in Sri Lanka, especially in Information Technology (IT) organisations. Using senior IT employees, this study investigates what extent their organisation adopts with cloud computing, the level of cloud computing usage, current use of cloud service model, usage of cloud deployment model, preferred cloud service providers and reasons for adopting and not adopting cloud computing. The study also describes why cloud computing is a solution for new normal situations and the cloud-enabled services used during and after the COVID-19 pandemic. The finding suggests that 87.7% of the organisations currently use cloud-enabled services, whereas 12.3% do not and intend to adopt. Considering the benefits, cloud computing is the solution post COVID-19 pandemic to run the business way forward.
Keywords: Cloud Computing, COVID-19, COVID-19 Pandemic, Cloud-enabled Services, Sri Lanka
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1. Introduction

The novel Coronavirus disease (COVID-19) was first reported in Wuhan, Hubei Province of China, in December 2019. It has quickly begun to spread across the world. It is rising increasingly and affecting all the countries and territories worldwide with more than 663 million confirmed positive cases, and mor than 6.6 million have been reported dead, while in Sri Lanka, 671,875 confirmed positive cases with 16,817 reported dead at the first week of March 2023 (Worldometer, 2023).

The global COVID-19 pandemic forced organisations to rethink our way of working, studying, helping and socialising. Cloud computing has played a vital role in allowing organisations and governments to use crises management and continuity solutions rapidly. Tozzi (2020) states that "the coronavirus pandemic has reshaped the way companies use the cloud. Some recent cloud computing trends stand to reason: For example, cloud adoption rates appear to be higher than ever. However, we also see cloud computing trends in the areas of compliance and security".

According to a report released after profiling 36 key vendors of cloud computing during the global covid-19 pandemic in August 2020, the global cloud computing market growth is estimated at 17.5% Annual Compound Growth Rate (CAGR) from $372.4 billion in 2020 to $832.1 billion by 2025 ("Cloud Computing Market by Service Model (Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS)), Deployment Model (Public and Private), Organization Size, Vertical, and Region - Global Forecast to 2025," 2020). It is very fortunate for the cloud vendors to offer their services to several organisations in the future and the new working from home trend is utilised by the organisations where the model is possible for their business purposes. As the national bureau of economic research publication reports, it is more likely that more people in management, professionals and associated occupations have seen a significant change in their working pattern by working from home across covid-19 pandemic and also people have discovered new ways of working remotely, and organisations reorganise that the pandemic shifts will lead to a long-lasting influence on the way how work is organised (Brynjolfsson et al., 2020).

2. Literature review

2.1 What is cloud computing?

Cloud computing provides the ability to access common pools of configurable resources such as computer networks, servers, storage, apps and services in a ubiquitous manner, which can be easily and continuously distributed over the internet by minimal management efforts. Cloud computing allows people to access different web services like they were on the computer. Industry experts and academia have suggested multiple formal concepts for cloud computing. The National Institute of Standards and Technology (NIST) developed in its document to define cloud computing as "cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Mell & Grance, 2011; (Athambawa, 2018) Karim & Soomro, 2020).

2.2 Cloud Computing Service Models

NIST Identified three service models that are used in cloud computing namely platform as a service (PaaS), software as a service (SaaS) and infrastructure as a service (IaaS).

2.2.1 Software as a Service (SaaS).

According to NIST, Software as a Service is the capability provided to the consumer is to use the provider's applications running on a cloud infrastructure (Mell & Grance, 2011; Karim & Soomro, 2020). SaaS eliminates the need for IT staff to download and install applications on a single computer. With SaaS, vendors manage all possible technical problems such as data, middleware, servers, and storage. It simplifies maintenance and business support. It substantially reduces the time and resources consumed on complex tasks such as program deployment, maintenance, and updating. It also gives technical employees plenty of time to spend on important issues and challenges in the organisation.

Examples: Google Apps, Zoom, Microsoft 365, Dropbox, Cisco WebEx and etc.

2.2.2 Platform as a Service (PaaS).

Platform as a Service is the capability provided to the consumer is to deploy the platform onto the cloud infrastructure (Mell & Grance, 2011; Karim & Soomro, 2020). PaaS model of delivery is equivalent to SaaS, but PaaS offers a cloud Platform rather than distributing the software over the internet. It helps software developers to focus on development without caring about the operating systems, software upgrades, infrastructure or storage. It offers many benefits which include affordable apps development and deployment, easy product delivery, readily available and accessible, developers can customise apps without the hassle of program routine maintenance.

Examples: Google App Engine, AWS Elastic Beanstalk, Windows Azure, Heroku, Apache Stratos and etc.

2.2.3 Infrastructure as a Service (IaaS).

Infrastructure as a Service is the capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications (Mell & Grance, 2011; Karim & Soomro, 2020). IaaS delivers a virtualisation technology to its cloud computing infrastructure where clients have direct access to their servers and storage, but it is outsourced through the cloud through a virtual data centre.

Examples: Google Compute Engine (GCE), DigitalOcean, Linode, Rackspace, Cisco Metapod and etc.

2.3 Cloud Deployment Models

Cloud deployment models reflect a certain category of cloud ecosystem characterised by ownership, size and access. National Institute of Standards and Technology (NIST) provides guidelines for each of the four cloud deployment frameworks (Private, community, Public and Hybrid) across its concepts. Every model offers to fill a particular niche, but a one-size-fits-all solution does not exist (RSI Security, 2018).

2.3.1 Private cloud.

Private cloud computing is a model of deployment that is bought and devoted to a particular user or organisation. No one other than the customer who owns the data saved in the Private Clouds Data Centre will access it. For organisations who believe who their data is sensitive or valuable, it is a perfect option.

2.3.2 Community cloud.

NIST describes a community-based cloud deployment model that is primarily used by a specific consumer community. This multi-tenant system enables multiple organisations to operate on the same platform as they have common criteria and needs. Community clouds would allow organisations to work in collaborative projects, apps or studies, and it is perfect for organisations that need their high-end security products to be tested.

2.3.3 Public cloud.

A public cloud is a deployment model owned and made open to the public by cloud service providers. Consumers may acquire new capabilities on demand without investing in new hardware or applications. Several organisations, including Facebook and Google, use public clouds to handle user data velocity effectively. Simultaneously, a public cloud can accommodate vast storage sizes, which helps organisations to work with many projects.

2.3.4 Hybrid cloud.
Hybrid cloud deployment models are integrated into a single environment of private and public cloud modelling. Hybrid clouds consist of parallel systems in which applications can be conveniently transferred between public and private clouds. Organisations that actively switch between public cloud projects and developing sensitive applications in their private cloud would likely opt for a hybrid cloud approach.

2.4 Why is Cloud Computing Being a Solution for the New Normal?
In recent years, the COVID-19 pandemic has led many lives and industries to an unhealthy situation. However, the cloud computing industry has grown stronger than ever before after the pandemic. Cloud helps all sized companies benefit from unlimited computing and computing energy costs without needing to spend on on-site resources and benefit from technological developments (Singh et al., 2021; Theby, 2022). The adoption of cloud technology also eliminates the need for IT staff to maintain or update the software when needed. Based on demand, the opportunity to increase or reduce cloud services enables cost-effective and extended access to IT resources. Cloud services will promote more efficiency and collaboration with companies. Collaborative technology empowers workers to access information and collaborate with any devices whenever and wherever they wish (Singh et al., 2021). Higher Educational organisations such as universities and colleges are shifting the teaching and learning process to the mode of eLearning (Al-Hajri et al., 2021; Aydin, 2021; Kumar Bhardwaj et al., 2021; Mahmoud Shafiq & Y. Shakor, 2019; Too et al., 2021).

According to (Athambawa et al., 2022; Kuruwitaarachchi et al., 2020), the technological acceptance and adoption of cloud computing are benefitted Sri Lankan organisations.

2.5 Cloud-Enabled Services that in Use During the COVID-19 Pandemic
In these times of social isolation during COVID-19, people with cloud applications could continue their digital lives through cloud-enabled services. Cloud computing is supporting in many ways to drive the world during the COVID-19 pandemic. Few cloud services listed here that heavily used during this pandemic.
2.5.1 Productivity Applications.
Any applications that people use to produce information called productivity applications. With human contact no longer an effective means of interacting during the pandemic, businesses and organisations across the world suddenly switched to digital solutions to sustain productivity. Furthermore, several developed countries already insist on the staff in non-essential industries to operate remotely for an unspecified length of time. Universities and schools often utilise productivity applications to promote learning in distances.

Examples: Microsoft Office 365, Open Office, Libre Office, Google Workspace, Zoho, and etc.
2.5.2 Infrastructure on-demand.
Infrastructure on-demand is a cloud technology that offers virtualised computing services, including storage, network, server, etc., via the internet when needed. On-demand infrastructure quickly increases or decreases resource allocation and prevents the need to acquire physical servers and other data center infrastructure. Cloud computing vendors operate the platform, and the customer configures and maintains devices, including software, middleware and operating systems ("What Is Infrastructure as a Service (IaaS)? | NetApp," 2020).

During the pandemic, when organisations switch their working pattern by working from home, they require a higher-end infrastructure like they were used on-premises that facilitate their employees to work efficiently from their home. This will provide a hassle-free business continuity solution to the management.

Examples: Google Compute Engine (GCE), Amazon Web Services (AWS), Microsoft Azure, DigitalOcean, Rackspace, Cisco Metapod, Linode, and etc.
2.5.3 Collaboration Applications.
A collaboration application is any application that encourages or promotes several individuals to interact and work together (Duffy, 2018). Before Covid-19, people usually interact in person and work together physically at their offices. Now with the uses of collaborative applications they interact virtually from their home.

Examples: Google Docs, Slack, Microsoft Teams, RemoteHQ, Microsoft Whiteboard, and etc.
2.5.4 Storage and backup Solutions.
Cloud storage is a cloud computing model that stores information on the internet through a cloud service provider that manages and runs data storage as a service (Amazon, 2019). They are on-demand for immediate delivery and it can be used as an alternative to on-premises data storage. This helps companies to be scalable, global, and sustainable with data access from anywhere at any time from any supportable devices. Post Covid-19, the organisations are switching on-premises data storage to cloud data storage as it is given the freedom to access the data from anywhere. Since the employees are working from home, cloud storage is a much-needed solution for any organisation. Cloud storage is also used as the backup solution for companies to ensure business continuity where the data sync in a certain time interval (daily/ weekly/ monthly) as a backup.
Examples: Google Drive, Dropbox, One Drive, Box, Amazon Drive, iCloud drive, and etc.

2.5.5 Communication.

Cloud communications are the integration of different forms of communication. It comprises integrated methods such as voice, chat, video, screen sharing and collaboration to maximise communication effectiveness. Cloud communications are primarily internet-based where a d third-party vendor manages the storage, frameworks and mediation across the cloud. During the pandemic, the service is used as a replacement for daily meetings, conferences, or even education as no one can meet closely in the classrooms. It is becoming a new norm for education in several universities and institutions.

Examples: Zoom, Google meet, Microsoft Team, and etc.

2.5.6 Desktop Virtualisation.

Desktop Virtualisation is a term that substitutes conventional physical desktops for remote computer systems (Yfantis, 2019 & Athambawa, 2010). Using this technology, anyone can access the hosted desktop computer from anywhere without self-managing the computer as normally do traditionally. It offers the most efficient approach for meeting today's cost reduction, better protection and greater flexibility demands. It is appropriate for any organisational size to access by multinationals from their home. This technology allows the organisation to work from any platform they desire to work by just navigating through the browser or any remote client application offered by the vendor.

Examples: Citrix XenDesktop, VMware vSphere and Amazon WorkSpaces

2.5.7 Big Data analytics.

Big data is a very powerful analytical technique to map and monitor the global spread of COVID-19. Information about a large number of patients infected with the virus can be stored in this technology. This technology has enabled the foundation for real-time analysis of strategic decisions to save people's lives and quickly decide the successful treatment.

Big data may be really helpful in evaluating and predict the magnitude and effect of coronavirus among individuals. The trackers of COVID-19 will gather real-time updates from outlets across the globe and then offer the updated knowledge to experts, physicians and governments that can be useful in making decisions to battle against the virus.

Example Tools: Xplenty, Power BI, Microsoft Azure HDInsight, Skytree, Splice Machine, IBM SPSS Modeler, etc.

2.5.8 Virtual Reality.

Virtual reality (VR) is a computer technology that offers a simulated experience. The atmosphere of this technology provides great convenience and productivity improvements. In real-time, people can work together through interactive whiteboards, visit the simulations and recorded material. The virtual reality cloud is used to build virtual reality codes on a remote server with infrastructure from a cloud service provider.

Virtual reality technology provides a perfect solution to render video calls during the COVID-19 pandemic. The biggest advantage of this medium is the potential to make people believe they're in the same room without travel. Therefore, without distractions, people will concentrate fully on the task. VR increases performance, increases group work, minimises travel costs and reduces absences and environmental effects. Therefore, VR is a strong method for collaboration during the period of COVID-19.

Examples: Google expeditions, Google Earth VR, 360 cities, Amazon Sumerian, PlugXR, and etc.

2.5.9 Holography.

Holography is 3D imaging with a shifting viewpoint. The hologram will recreate the original object's accurate 3D image. It offers businesses an option to virtualise their activities without webcasting. Using this, businesses can introduce products and create brands. Holography technology uses cloud storage (holostorage) to store computer-generated 3D data to access anywhere in the world.

Digital holography technology has opened up a new direction for conferences and live events. It means that speakers, staff and consumers are less vulnerable to COVID-19. It looks like speakers are virtually on a real stage from their homes or workplaces , and a group of Thousands of individuals will engage concurrently in live streaming. This technology of streamed holographic activities is conveniently appropriate during this COVID-19 pandemic, as employees remain at home and work from home.

Examples: Pepper's Ghost, HoloLamp, Optics Express, Voxon Photonic engine, Fairy Light and etc.

2.6 Top 10 cloud computing service providers

Fundamental changes have occurred in the global IT infrastructure industry due to cloud computing and the top 10 cloud service companies supplying these services. Providers of public cloud services are making it easier for businesses to take advantage of the cost savings and other benefits of cloud computing, paving the way for developing cutting-edge software applications and platforms while strengthening data protection measures. Therefore, learning about the several prominent cloud service providers and their approaches is crucial (Zhang, 2022). Further, Zhang (2022) added that "the top 10 cloud service providers globally in 2023 are Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), Alibaba Cloud, Oracle Cloud, IBM Cloud

(Kyndryl), Tencent Cloud, OVHcloud, DigitalOcean, and Linode (owned by Akamai)".

The study explored the most usable cloud service providers in Sri Lanka and found that the top 10 service providers in Sri Lanka are Google Cloud, Amazon AWS, Microsoft Azure, Digital Ocean, IBM Cloud, Salesforce, Oracle Cloud, SAP, Rackspace and Vmware

3. Methodology

The study was conducted among two hundred and fifty-six (256) Information Technology (IT) organisations in Sri Lanka when the COVID-19 severity is little relaxed and many organisations already working from home, or at any remote location other than the usual working place. The study is to identify the level of cloud computing adoption that is enabling the new phenomenon of working from home during COVID-19 lockdown and after.

As per the data derived from "Membership -SLASSCOM" (2020), "Membership-FITIS" (2020) and "ICT Service Exporters in Sri Lanka - EDB," (2020), there are four hundred and thirty-six (436) IT organisations selected as a random sample to participate in the study. However, only two hundred and fifty-six (256) usable questionnaire responses received and used for data analysis. Since this study used quantitative method data collection, primary data is used and collected using a pre-structured questionnaire including company details, current usage of cloud technologies, cloud service model, cloud deployment model and preferred cloud service providers. The questionnaire is developed in the google form and distributed by Email and Linkedin. Collected data is analysed using SPSS 27 to determine the cloud adoption level during COVID-19.

4. Results and Discussion

4.1 Cloud Computing Service Model and Deployment Model usage

Out of 256 respondents, Table 1 indicates that 67.2% (172) of the Sri Lankan IT industry SMEs use SaaS for their software development or hosted application usage needs, while 50.8% (130) SMEs use PaaS for their software development needs in addition to their traditional platform. IaaS is used by 55.1% (141) of the SMEs to virtualise the platform to utilise better resources for their needs.

Table 1: Cloud Computing Service Model Usage

Cloud computing service model	Frequency	Percentage
Software as a service (SaaS)	172	67.2
Platform as a service (PaaS)	130	50.8
Infrastructure as a service (IaaS)	141	55.1

Cloud computing is further categorised by its deployment models as indicated in table 2: Private cloud, Community cloud, Public cloud, and Hybrid cloud. The majority, 46.9% (120) of the IT industry SMEs in Sri Lanka, opted for private cloud since this deployment model's higher privacy level. However, only 26.2% (67) SMEs use the community cloud, 34.8% (89) SMEs use the public cloud, and 31.6% (81) SMEs use the hybrid cloud.

Table 2: Cloud Computing Deployment Model Usage

Cloud Computing Deployment Model	Frequency	Percentage
Private Cloud	120	46.9
Community Cloud	67	26.2
Public Cloud	89	34.8
Hybrid Cloud	81	31.6

4.2 Cloud computing usage at the organisation

The IT Industry SMEs in Sri Lanka use various cloud-based applications. Table 3 indicates that 77.3% (198) organisations use productivity applications such as office applications, email, etc., 6.3% (16) are expected to use them in the future, and 3.5% (9) are not expected to use them. 75.4% (193) organisations use Infrastructure on-demand, such as storage, network, server, etc., 10.2% (26) are expected to use them in the future, and 1.6% (4) are not expected to use them. 73% (187) organisations use collaboration applications such as Google Docs, 6.6% (17) are expected to use them in the future, and 7.4% (19) are not expected to use them. 74.6% (191) organisations use cloud backup solutions such as Google Drive, Dropbox, etc., 9.4% (24) are expected to use them in the future, and 3.1% (8) are not expected to use them. 52.7% (135) organisations use cloud-based Application Development, 31.6% (81) are expected to use them in the future, and 2.7% (7) are not expected to use them. The majority of the organisations, 79.7% (204), use cloud-based communication such as Zoom, Google meet, etc., 3.9% (10) are expected to use them in the future, and 3.5% (9) are not expected to use them. 35.9% (92) of Organisations use Desktop virtualisation such as Citrix XenApp, Microsoft Remote Desktop Services, etc., 22.7% (58) expected to use them in the future, and 28.5% (73) are not expected to use them. 21.9% (56) organisations use Big data analytics, 48.8% (125) are expected to use them in the future, and 16.4% (42) are not expected to use them.

Table 3: Cloud computing usage at the organisation

Services	Use Frequency	Use %	Expected Use Frequency	Expected Use %	Not Expected Use Frequency	Not Expected %	Total
Productivity Applications	198	77.3	16	6.3	9	3.5	223
Infrastructure on-demand	193	75.4	26	10.2	4	1.6	223
Collaboration Applications	187	73.0	17	6.6	19	7.4	223
Backup Solutions	191	74.6	24	9.4	8	3.1	223
Application Development	135	52.7	81	31.6	7	2.7	223
Communication	204	79.7	10	3.9	9	3.5	223
Desktop Virtualisation	92	35.9	58	22.7	73	28.5	223
Big data analytics	56	21.9	125	48.8	42	16.4	223

In addition to the above-mentioned cloud services, some respondents stated that they are currently using Business intelligence, Cognitive services, CRM, Machine Learning, Project management and Task management platforms. Further, few respondents stated that they would be expected to use many cloud services in the future, which are not mentioned above.

4.3 Cloud Service Providers in Sri Lanka

The study finds the preferred cloud service providers where the organisation relies on their cloud services being hosted. As shown in Table 4, Google, Amazon and Microsoft offer cloud services to most IT organisations in Sri Lanka. Among the respondents, 53.9% (138) organisations use Google Cloud, 55.5% (142) organisations use Amazon AWS, and 48.8% (125) organisations use Microsoft Azure. Many other cloud service providers offer service to a few organisations listed in table 4: Digital Ocean, IBM Cloud, Salesforce, Oracle Cloud, SAP, VMware, and many other cloud service providers. Many IT Organisations in Sri Lanka utilise cloud services from multiple service providers for their service needs.

Table 4: Cloud service providers in Sri Lanka

Cloud Service Provider	Frequency	Percent
Google Cloud	138	53.9
Amazon AWS	142	55.5
Microsoft Azure	125	48.8
Digital Ocean	48	18.8
IBM Cloud	19	7.4
Salesforce	9	3.5
Oracle Cloud	18	7.0
SAP	10	3.9
Rackspace	4	1.6
Vmware	17	6.6
Other	8	3.1

4.4 Satisfactory level of adoption of cloud computing

According to table 5, among the 223 organisations that have already adopted cloud computing, the satisfactory level of cloud services among the organisations responded as 40.8% (91) were Extremely satisfied, 43% (96) Very satisfied, 9.9% (22) were Moderately satisfied and only 14 organisations are slightly satisfied or not satisfied. Most of the organisations, 36.3% (81) and 34.5% (77), responded as they were extremely satisfied and very satisfied respectively with the reliability level of the cloud services, while 22.4% (50) were moderately satisfied and the remaining 15 organisations stated as they are slightly satisfied or not satisfied. The organisations positively reported the satisfaction level of data protection mechanisms by the cloud service providers as they are extremely satisfied by 30.9% (69) organisations and very satisfied by 37.7% (84) organisations, while 19.3% (43) organisations moderately satisfied and the remaining 27 organisations states as they are slightly satisfied or not satisfied. The satisfaction level of data integrity on cloud-hosted data among the organisations responded as 29.6% (66) were Extremely satisfied, 38.6% (86) Very satisfied, 24.7% (55) were Moderately satisfied and only 16

organisations were slightly satisfied or not satisfied. Most of the organisations, 38.6% (86) and 39% (87), responded as they were extremely satisfied and very satisfied respectively with the level of data availability, while 15.2% (34) were moderately satisfied and the remaining 16 organisations stated as they are slightly satisfied or not satisfied. The organisations positively reported the satisfaction level of service provider's disaster recovery plan as they are extremely satisfied by 27.4% (61) organisations and very satisfied by 39.5% (88) organisations, while 23.3% (52) organisations moderately satisfied, and the remaining 22 organisations stated as they are slightly satisfied or not satisfied.

Table 5: Satisfactory level of adoption of cloud computing

Concern	Frequency & %	Extremely Satisfied	Very Satisfied	Moderately Satisfied	Slightly Satisfied	Not Satisfied	Total
Satisfaction level of cloud services	Freq	91	96	22	10	4	223
	%	40.8	43.0	9.9	4.5	1.8	100.0
Reliability level of the cloud services	Freq	81	77	50	10	5	223
	%	36.3	34.5	22.4	4.5	2.2	100.0
Data protection mechanism by the cloud service providers	Freq	69	84	43	21	6	223
	%	30.9	37.7	19.3	9.4	2.7	100.0
Level of data integrity	Freq	66	86	55	13	3	223
	%	29.6	38.6	24.7	5.8	1.3	100.0
Level of data availability	Freq	86	87	34	12	4	223
	%	38.6	39.0	15.2	5.4	1.8	100.0
Service provider's disaster recovery plan	Freq	61	88	52	15	7	223
	%	27.4	39.5	23.3	6.7	3.1	100.0

4.5 Non-adopters of cloud computing

As per the analysis, it is understood that 12.9% (33) IT Industry SME organisations in Sri Lanka have not currently adopted any cloud computing services and only rely on traditional computing. The researcher further analysed the awareness of cloud computing technology and services; as per table 6, 3.1% (8) organisations are unaware of cloud computing, but 9.8% (25) organisations are aware of cloud computing and are not currently adopted.

Table 6: Awareness of cloud computing technology and services

	Frequency	Percent
No	8	3.1%
Yes	25	9.8%

The reason for not using cloud computing are indicated in table 7; among the total sample, 2.7% (7) indicated that their organisation's top management is not aware of cloud computing and they are not interested, 3.9% (10) indicated that the organisation has no technical people to implement Cloud Computing, 3.1% (8) mentioned as the organisation has no technical people to implement Cloud Computing, 2% (5) organisations have the inadequate IT infrastructure to use Cloud services, 3.1% (8) organisation has no sufficient financial resource to subscribe, 3.1% (8) organisation has issues in contracting with cloud vendors and 3.5% (9) organisation has no clear idea of the Cloud computing cost structure. 2.3% (6) organisations stated that they have other reasons for not using cloud computing, such as cloud computing is a big challenge and hard to maintain, there is no guarantee for the data protection and they are managing their data in-house and no adoption needed.

Table 7: Reasons for not using cloud computing

Reason	Frequency	Percent
Organisation top management is not aware and not interested.	7	2.7%
The organisation has no technical people to implement Cloud Computing.	10	3.9%
Organisation decision-makers are worried about their confidential data.	8	3.1%
The organisation has inadequate IT infrastructure to use Cloud services	5	2.0%
The organisation has no sufficient financial resource to subscribe.	8	3.1%
The organisation has issues in contracting with cloud vendors.	8	3.1%
The organisation has no clear idea of the Cloud computing cost structure.	9	3.5%
Other	6	2.3%

5. Conclusion

The objective of this study to measure the level of adoption and current usage of cloud enabled services during

and after COVID-19 pandemic among the IT organisations. The study recommends that the cloud computing is the solution for new normal after COVID-19 Pandemic. The study also examines reasons for not adopting cloud computing. As the COVID-19 effect continues throughout the world, further research is required in several perspectives such as education, logistics, supply chain and financial sectors to use and adopt cloud computing.

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