

Original Research Article

Adoption of Cloud Computing Services in private hospitals in Sri Lanka:

Special attention to Colombo District

Abstract

Cloud computing is the most important part of information technology that provides solutions to improve healthcare sectors. This innovation helps organizations to enhance or redesign the services at less expensive charges. The study analyzes the factors that impact in adopting Cloud computing technologies in private hospitals in order to adopt a cloud computing innovation benefit in Sri Lanka. This study was conducted using quantitative methodology and 125 questionnaires were distributed to the Information Technology (IT) departments of the private hospitals to evaluate their ability and willingness to embrace cloud computing services. Multiple regression analysis was used in order to decide whether Technology, Organizational, and Environmental Factors (TOE) played a role in private hospitals' decision to consider cloud computing technology services as an effective investment. The findings of this study have had a significant positive impact on the willingness of private hospitals to adopt the cloud computing technologies in Sri Lanka.

Keywords: Cloud Computing, Private Hospitals, Adoption Benefits, Sri Lanka, TOE Framework

1.1.Introduction

Due to global competitions, companies have been pressuring to maximize their expenditures, increase profits and enhance productivity, in order to compete globally in this rapidly changing environment [1]. It has encouraged IT managers to adopt the most modern technologies in order to reduce costs, maintain competing benefits and improve the bottom line [2][3].

The use of information technology can enhance the efficiency of businesses and provide companies with a favorable advantage [4]. Most of the services offered by Information Technology (IT) service providers are expensive and time consuming due to delay in updating their existing technologies, adoption of cloud computing has advanced as a noteworthy technological development to reduce these handling costs that occur time to time [5][6]. Cloud Computing has been introduced as a key technological innovation to minimize the processing

cost by improving the reliability, flexibility, availability and processing [6].Lately, cloud computing in the IT industry is an important consideration; it is perceived as an imperative piece of IT venture [7].

Cloud computing is viewed as another wonder, which provides opportunities for companies, collects easily accessible virtual system resources [6], there is an opportunity to facilitate economic growth by providing the already existing infrastructure for implementation of computing and data management that needs with low capital investment for organizations.Cloud computing technologies have become a serious target in the Information Systems Development Industry; it provides companies with different advantages such as resource pooling, quick flexibility, wide network access...etc. [8].The use of new technologies such as cloud computing allows many companies to gain competitive efficiency and allow them to increase efficiency and productivity[9]. The appropriation of the most up to date advances, similar to cloud computing, assumes a basic part in the capacity of organizations to keep up an aggressive position in the market, and has turned into a center system to guarantee powerful administration of IT resources [10].Whether or not to follow the cloud computing model is often complicated by challenges and uncertainty about anticipated business value associated with new technologies [11]. Variousstudies have been discussed about the Technological, Organizational and Environmental factors (TOE) that impact the cloud computing adoption.Though, analysis of this technology is still essential in various business segments for better understanding of cloud computing [12].

Since the end of the civil war in 2009, health sector have been regarded as one of the profitable sectors in Sri Lanka on the account of increased consumption of healthcare services and growing investment flowing from both private and public institutions.Patients around the world fly to Sri Lanka to treat in private hospitals, but it is still suffering from a number of challenges; like difficulties in managing the information to integrate pressure, intense competition, people and companies to reduce costs, growth and diversification, suppliers, payment sources, suppliers and customers to continue to maintain and maintain competitive benefits. Anywhere, is required to access information and services from these growing challenges.

Furthermore, reference [14], there are many studies that have studied cloud computing architecture, potential use and advantages and costs. Unfortunately, there are some empirical

studies that have learned about the use of cloud computing in general and in South Asian context and also due to the lack of such studies, this study provides clear understanding to the impact of TOE factors on the adoption of cloud computing. This research is carried out to understand how TOE factors that affect cloud computing adoption in private hospitals in Sri Lanka, particularly in Colombo city. Therefore, the findings of this research can assist organizations, more specifically private hospitals to, firstly, better understand cloud computing itself and, secondly, how Cloud computing can increase hospitals' effectiveness. Moreover, this study can be considered as guidelines to how TOE factors can affect the decision of whether to invest in adoption of cloud computing model or not.

2. Literature Review

2.1. Cloud Computing

Cloud computing can be defined in many different ways. Cloud computing is defined by the National Institute of Standards and Technology (NIST) as “a model for enabling ubiquitous, 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”. It also can be defined as a technology for providing highly scalable services which empowers IT managers to adjust to changing business requirement by easily obtaining and releasing computing services as needed [16].

Moreover, it can be viewed as a computing pattern where scalable IT related capabilities are given as a service over the internet to various external customers, using interconnected and virtualized computers that allocate resources based on service-level agreement negotiated between service provider and clients [17][18]. It is also defined as a pool and as an inefficient infrastructure to improve end-user applications that will be charged for consumer use [19]. Information systems are based on future cloud computing technology; because it increases reliability and flexibility, IT services can reduce costs [20]. It is also considered as a possible solution for improving Information Technology competence and efficiency [20] [21]. Cloud computing has three service models; first, Infrastructure as a system (IaaS). It is known as the fundamental level of cloud services, which delivers infrastructure services to customers over a

network like hardware and software [8]. Platform as a service (PaaS) is the second level of cloud computing. It offers online access to every resource that is needed to build an application. The services include; application design, development, testing, deployment and hosting tools, which provide access to programming languages and libraries [22]. The third service model is Software as a service (SaaS). It is known for providing users with a piece of software over a network such as internet, where it enables users to install the software and use the application anytime and anywhere they have access to the network [23].

Therefore, the above literature evidencethat many problems with the adoption of cloud computing is exists. One of them is that are no clear understanding of the relationship between TOE factors and the adoption of cloud computing [24]. The adoption of cloud computing will be perceived positively by organizations if they have an adequate budget, human resource support, ample time, good top management involvement and other factors [25].

2.2. TOE Framework

The TOE structure was mainly created by references [26] and was mainly investigated for adoption of information systems in business organizations. This framework is becoming an important theoretical guideline for Information Technology adoption [27]. According to reference [28], the adoption of complex IT innovation requires an advantageous technology portfolio, organizational structure, and environmental strategy. For the purpose of this study, the theoretical model is needed in order to get better understanding for this technology.

The current study suggests that three components are dependent on determining companies' intent to embrace cloud computing, these are: Technological, Organizational and Environmental. The incorporation of TOE elements has leaded it to become more valuable compared to other models in studying technology adoption [29].

2.2.1. Technological Factors (TF)

The Technological context refers to the internal and external technologies that companies can use in their business [12]. Internal Technologies are already being used in the company, externally available in the marketplace and do not use [30] by the company. Technologies that are currently in use by the firm influence decision of adopting cloud computing because they

determine the scope and limit of the technological change that the firm can accept. By adopting new technologies, by the way the companies can develop, technologies and market-access adoptions are not at the end of the adoption. The changes brought about by technologies that exist beyond an organization's boundaries include incremental, synthetic, or discontinuous changes. Technologies that offer incremental changes only add new features to existing technologies and are regarded as the least risky of the three. Discontinuous changes are technologies that are radically different from existing ones [6]. Even though the successful adoption of IT depends on a large degree of technical capacity of the organizations and there is a dearth of studies that take technological characteristics into account when studying factors affecting IT adoption decision. Technological factors can be discussed from three point of views; Relative Advantage, Complexity and Compatibility[31].

2.2.1.1. Relative Advantage

Relative advantage is defined as a Technological factor that provides many potential benefits to companies. It is logical for organizations to weigh the benefits that are expected to come from adopting an innovation [32]. The probability of adopting new technologies increases when companies realize a comparative advantage in those innovations [33]. Cloud computing promises various advantages to organizations that adopt it such as speed of business communication, efficient coordination among firms, better customer communication, and access to market information mobilization [12]. Other benefits of cloud computing include reduced costs, scalability, flexibility, mobility, pay-per-use, and shared resources [34]. Business organizations can avoid expenses associated with owning and maintaining an in house IT infrastructure that is not fully utilized by using cloud computing, thereby radically reducing the total cost of IT operations [17]. Cloud computing also offers rented service where organizations pay-per-use which leads to adjusting the level of usage according to the organization's current needs [6].

Furthermore, as the requirements for cloud computing increase, the user is able to scale up resources and infrastructure to satisfy new requirements [35]. Moreover, the ability to offer shared resources is another advantage of cloud computing that enables employees to access resources placed on cloud regardless of their location, thus saving businesses a lot of time and money [36].

144 **2.2.1.2. Compatibility**

145 Compatibility refers to “the degree to which an innovation is perceived as consistent with the
146 existing values, past experiences, and needs of potential adopters” [34]. Perceived compatibility
147 takes into consideration whether current values, behavioral patterns, and experiences of an
148 organization and its members are consistent with a new technology [41]. Increased compatibility
149 between an innovation and adopters’ needs facilitate an easy integration of the technology within
150 the organization and business functions.

151 Furthermore, technology recognizes that the existing systems and company values and beliefs
152 are in congruence with the need to think more about using cloud computing. Cloud computing
153 allows organizations to keep up with new technology without affecting existing legacy systems
154 aligned with their different organizational, managerial, and operational needs [43].

155 **2.2.1.3. Complexity**

156 Complexity can be defined as the perceived degree of difficulty of understanding and using a
157 technology. It is related to time taken to perform tasks, integration with cloud infrastructure,
158 efficiency of data transfer, system functionality, and interface design [37] [23]. According to
159 reference [34], the probability of adopting a new innovation will be less likely if it is seen as
160 more challenging to use and adopting new technologies may present organizations with
161 challenges such as changing the processes that interact with their business systems. In order to
162 increase the chances for adoption success, technologies should be user friendly, manageable, and
163 easy to use [38] [39]. Furthermore, cloud computing is still in its early stages which may scare
164 organizations away from adopting such a new technology [40].

165 **2.2.2. Organizational Factors (OF)**

166 Organizational factor can be defined as the resources and characteristics of the firm [44]. In this
167 study the organizational context is composed of two main components that top management
168 support and technological readiness.

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170

2.2.2.1. Top Management Support

Top management support plays a significant role in initiating, implementing, and adopting of information technology [23]. Top management support has an important role in initiating, implementing and adopting of innovative ideas. Top managers are responsible for setting organizational strategy and for establishing direction for new technologies such as cloud computing. Top managers can secure enough resources and produce a supportive climate for cloud computing [24]. Top management awareness of potential benefits of adopting cloud computing is regarded as essential to manage potential organizational change through an expressed vision and commitment, sending positive signals of confidence in the new technology to all employees of the firm [12]. By obtaining such support, it helps the company to avoid alternative resistance to avoid any internal obstacles. Therefore, it can be concluded that top management support is vital for organizations searching to produce a competitive environment, whilst also providing the resources needed to adopt cloud service [41].

2.2.2.2. Technological Readiness

Technological readiness is the readiness of infrastructure and IT human resources to affect the adoption of a new technology [29]. As far as technological infrastructure is concern it can be said as that “installed network technologies, and enterprise systems, which provide a platform on which the cloud computing application can be built”. IT human resources are considered the sources of knowledge and skills that are needed to implement cloud computing related IT applications [12].

2.2.3. Environmental Factors (EF)

Environmental Context means that small environment where the organization runs their business including industry market as well as Technology Service Providers [43]. Environmental context refers to a firm’s industry, competitors, and government policy or intention [31] [12]. The environmental factors used in the study include competitive pressure, trust and trading partner pressure.

2.2.3.1. Competitive Pressure

Competitive pressure is the amount of pressure the company faces from their competitors in the same industry [45]. When technology hits the competition, this competition can play a positive role in accepting any new technology [46]. Accepting technology, it helps companies that change competition environment in various ways, such as technology and competitive competitors. Cloud computing technology helps companies to increase the operating efficiency, data accuracy, and decrease costs [12]. Therefore, organizations that are first to adopt cloud computing are expected to derive benefits in terms of competitive advantage and survival [23].

2.2.3.2. Trust

With a high level of risks and existing uncertainties in the Internet environment, trust is a critical factor [47]. Further it is important for online interaction success [48]. Building trust is a core requirement for establishing new relationships concerning security, confidentiality, integrity, non-repudiation and trust, especially in an online virtual environment. There is a misguided understanding that equates online trust with underlying security requirements [49]. Security requirements include authenticating users or Web sites and ensuring the confidentiality and validity of online interactions. Those requirements form an essential foundation. However, business trust also encompasses the non-technical issues surrounding online transactions between online partners. Those issues must be satisfied. In other words, sufficient trust must be established for any relationship to deliver the desired business value [49].

2.2.3.3. Trading Partner Pressure

In cloud computing, business partners are connected to cloud service providers. When you want to observe cloud services, the business associates are overstaffing, regardless of the size of the company's experiences and capabilities. Business Partner may decide whether or not the previous history and past projects are a new information technological innovation or not [43]. Organizations that want to adopt cloud services are concerned about the ability of service providers to ensure the availability of data when needed. To ensure the desired level of availability, service level agreements and a combination of precautionary measures can be used.

Security is another concern organizations have with regards to trading partners. Cloud computing security is more than just authenticity, authorization, and accountability; it is also related to data protection, disaster recovery, and business continuity. Privacy and confidentiality also relate to security because service providers have access to all the data and could intentionally or unintentionally use it for unauthorized purposes [23].

2.3. Factors Affecting Cloud Computing Adoption

Several studies have been taken to understand the various factors that affect the decision to accept various technologies [50]. For cloud computing, researchers have chosen different ways to explain or encourage companies to adopt cloud computing. Reference [12], for instance, examined the effect of eight factors: “relative advantage, complexity, compatibility, top management support, firm size, technology readiness, competitive pressure, and trading partner pressure” on the decision of high tech companies to adopt cloud computing. The findings indicated that five of these factors, namely: “relative advantage, top management support, firm size, competitive pressure, and trading partner pressure, significantly affected the adoption of cloud computing”.

Reference [30] “examined the influence of the TOE framework on the adoption of cloud computing in SMEs”. The factors included in this study were technology factors (“relative advantage, uncertainty, compatibility, complexity, and trainability”), organizational factors (“size, top management support, innovativeness, and prior IT experience”), and environmental factors (“competitive pressure, industry, market scope, supplier efforts and external computing support”). The results showed that most of these elements had a significant effect on the adoption of cloud services in SMEs. The only factor that was not found to have any contribution in the process of adopting cloud computing was competitive pressure. Since this factor has not been contributed, as researcher, particularly in my field of research, I feel that this factor may have significant influence, because the study set is different from the above mentioned area of study. In addition, reference [43] used the TOE framework to determine which factors influence the decision of managers to adopt cloud computing in the UK. The results indicated that the following four factors had positive impact on the adoption: “competitive pressure, complexity, technology readiness and trading partner pressure”.

Reference [50], studied that, advancement in technology is always required to give vast information for every healthcare professional to give the best quality of the patient care and hospital management. Cloud computing is providing services to web based technology clients as and when required by storing information in servers. In cloud computing, Virtual Machines (VM) will be running different software in parallel instead of having to run only one application leading to higher efficiency and better utilisation of computing resources. This technology drives down costs and increases resources utilisation by delivering resources for the period of requirement only and hence reduces the ICT capital budget reservation. By giving additional support to the user for getting vast information through the existing support of Google Cal, Docs, Sites, Zoomerang, YouTube etc, cloud computing also adds value. It is already used successfully in the library information systems. In a group of hospitals having cloud computing infrastructure encourage and promote the advantages available to the user community.

Moreover, Reference [25] studied the effect of various factors on the decision of hospitals in Taiwan to adopt cloud computing. The study revealed that the five most critical factors were data security, perceived technical competence, cost, top manager support, and complexity. Further, it was noted that among the four dimensions proposed to influence the adoption of cloud computing, the most important one was technology, followed by human, organizational, and environmental factors. A study was conducted by reference [51] with the aim of identifying the factors with the most influence on the intention of organizations to adopt cloud services. The study found that the factors of availability, reliability, security, privacy and others had a significant impact on the decision to adopt cloud computing. Reference [23] also tried to understand which factors influenced the adoption of cloud computing in organizations. The researchers used an integrated model composed of both Technology Acceptance Model (TAM) and TOE factors in addition to two mediating variables including perceived usefulness and perceived ease of use to explain the variation in the dependent variable, intention to adopt cloud computing. The findings of the study suggested that relative advantage, compatibility, complexity, organizational readiness, top management commitment, and training and education were the most important variables affecting the adoption.

3. Research Model and Hypotheses

The main objective of this study is to investigate the influence of TOE elements on the Intention of organizations, particularly health sectors to adopt Cloud computing technology and services. Therefore, the principal interest variant is the “Intention to adopt cloud computing”, which is the dependent variable, and Technological, Organizational, and Environmental factors are the independent variables used to explain the variance in the dependent variable. The research Model of the study is represented in Figure 1.

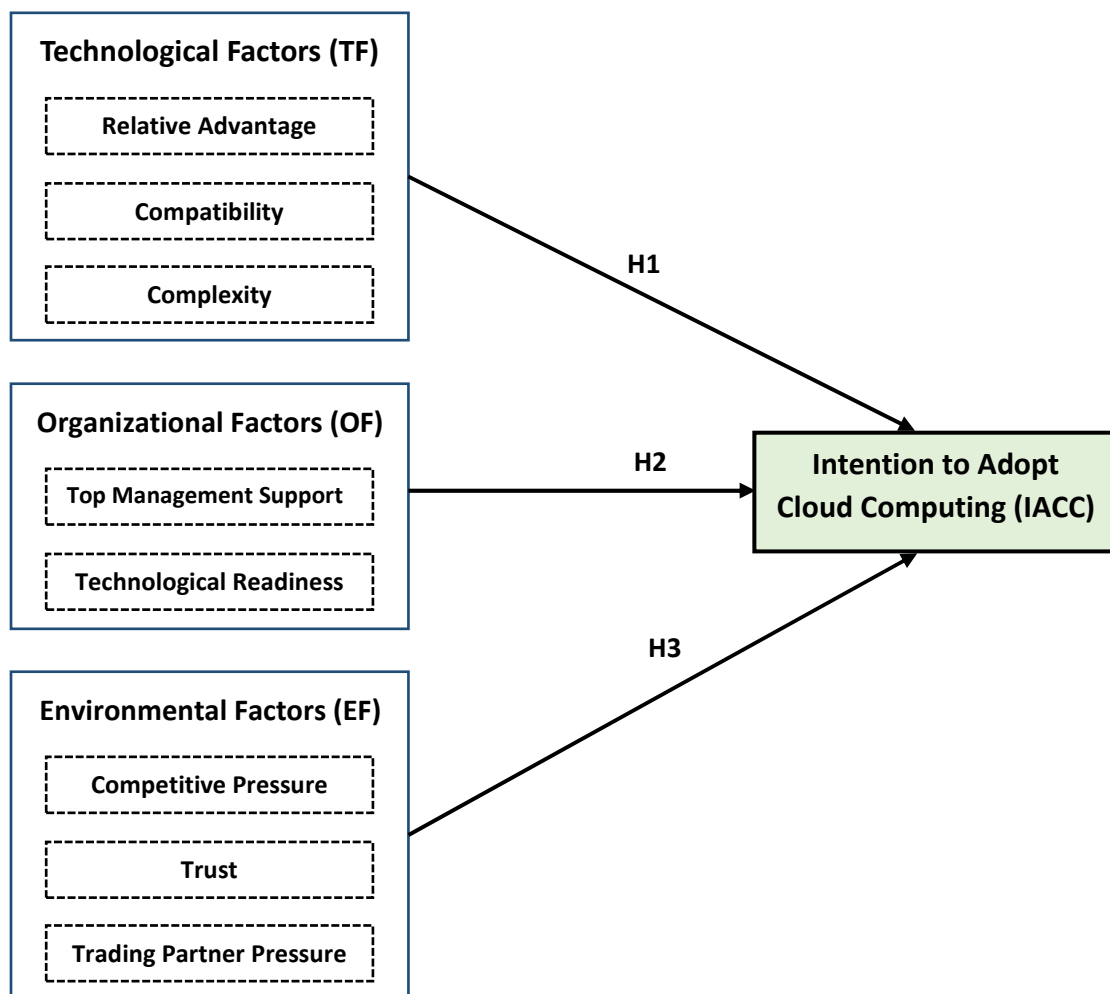


Figure 1, Research Framework of the study

304 Based on the objectives and the research model, the following hypotheses are developed in order
305 to test.

306 **H1:** Technological Factors (TF) do not influence the intention to adopt Cloud
307 Computing.

308 **H2:** Organizational Factors (OF) do not influence the intention to adopt Cloud
309 Computing.

310 **H3:** Environmental Factors (EF) do not influence the intention to adopt Cloud
311 Computing.

312 **4. Research Methodology**

313 A quantitative research will be conducted in order to evaluate how Technological,
314 Organizational and Environmental factors affect the cloud computing adoption decision. Data
315 was collected through a self-administered questionnaire. This method, which will attempt to
316 help hospitals gain a better understanding about how these three factors affect their decision to
317 adopt and deploy a cloud computing model.

318 The population of the study consisted of 25 private hospitals that operate in Colombo district, Sri
319 Lanka. 125 questionnaires were distributed to the employees working in the IT department in
320 private hospitals located in Colombo. The hospitals were selected randomly based on Uma
321 Sekaran sampling method, employees' were chosen from each of randomly selected hospitals
322 to represent the sample used in this research [53]. This study focuses on the factors affecting on
323 adoption of cloud computing. So, the target's respondents are the decision maker and people from
324 information technology departments such as head of information system, chief of information
325 technology office and senior information technology. Therefore, the respondents should have
326 some knowledge in information technology.

327 TOE factors that affect the decision to adopt Cloud computing are measured by 8 variables;
328 Technological factor which includes 3 items; relative advantage, compatibility and complexity as
329 suggested by reference [34], Organizational factor that includes 2 items; top management
330 support and technology readiness are also derived from [43]. Finally, Environmental factor

includes 3 items; where competitive pressure, trust and trading partner pressure are derived from a study conducted by reference [34] [49] [52]. Cloud computing adoption was measured through 3 items based on a study conducted by [24]. Statistical Package for Social Sciences (SPSS) version 21 is used in order to investigate the association of hypotheses and to analyze the data. A measure of multiple regression analysis was conducted, in addition to reliability and multicollinearity tests. The results are the instrument for accepting or rejecting the hypotheses and answering the research questions.

5. Data Analysis and Results

In order to examine the effect of TOE research model on the intention to adopt cloud computing in private hospitals in Colombo district in Sri Lanka, 5 points likert scale systems were used. The following indicate the scale;strongly disagree:1, disagree:2, neutral:3, agree:4, strongly agree:5.

5.1 Demographic Characteristics

The following section present the demographic characteristics of the respondents through two aspects: gender and years of experience using online service.

Table .1 Demographic characteristic of the respondents

Item	Frequency	Percentage
<i>Gender</i>		
Male	69	73.14
Female	37	39.22
<i>Years of experience using online services</i>		
Less than 3 years	28	29.68
Between 3-5 years	46	48.76
More than 5 years	32	33.92

According to the demographic profile Table.1 above, majority of the respondents have been participated in the survey are male of 73% and around 39% of the respondents are female. Years of experience in using online services is concerned, around 30% of the respondents are having less than 3 years of experience in using online services, while 49% of the respondents are having experience between 3-5 years. Around 34% of the respondents are having more than 5 years of experience in using online service in their organizations.

5.2. Reliability and Validity

Validity and reliability are two important measures that determine the quality and usefulness of the data collected. Validity is about accuracy and whether the instrument measures what it is intended to measure. Reliability is about precision; it is used to check the consistency and stability of the questionnaire. Researcher adopted, scales and items that were previously developed and used by other researchers with similar interests. In addition, a draft of the questionnaire was reviewed by two experts in this area of study to make sure that each item is measuring what is expected to measure, and to avoid any ambiguity or complexity in the phrasing of the questions. The reliability of the instrument was measured by the Cronbach's alpha coefficient. According to [54], the values of all indicators or dimensional scales should be above the recommended value of 0.7.

Table 2. Result of Reliability Test

Reliability Statistics Variable	Cronbach's Alpha	N of Items
TF	0.815	7
OF	0.832	8
EF	0.756	7
IACC	0.828	3

Generally, the higher value of Cronbach's Alpha illustrates a higher reliability. For reliability test, the normal standard value is 0.7. Therefore, if the value of alpha more than 0.7, then a high reliability has been proved. For the three constructs: Technological Factors (TF), Organizational Factors (OF), and Environmental Factors (EF), Cronbach's Alpha value are 0.815, 0.832 and 0.756, respectively. The alpha value of Intention to adopt Cloud computing (IACC) is 0.8.28, it is larger than 0.7. Therefore, the questions for each construct are consistent, so that the designed questionnaire has an acceptable reliability to process the research and to perform further analysis.

5.3. Hypotheses Testing Results

In order to test the hypotheses developed for this study, multiple regression technique was used. Further, the level of significance (α -level) was chosen to be 0.05 and the probability value (p-value) obtained from the statistical hypotheses test is considered to be the decision rule for rejecting the null hypotheses [55]. If the p-value is less than or equal to α -level, the null

hypothesis will be rejected and the alternative hypothesis will be supported. However, if the p-value is greater than the α -level, the null hypothesis cannot be rejected and the alternative hypothesis will not be supported.

In statistics, multicollinearity is a phenomenon in which two or more predictor variables in a multiple regression model are highly correlated, meaning that one can be linearly predicted from the others with a substantial degree of accuracy. As suggested by [56], most of the values should be inside the adequate ranges for normality. For this purpose, tolerance and Variance Inflation Factor (VIF) were examined.

Table 3. Tolerance and VIF for the independent variables

Variables	Tolerance	VIF
TF	0.816	1.407
OF	0.704	1.565
EF	0.784	1.433

From the above Table 3, it can be seen that VIF ranges between 1.407 and 1.565 which are well below five. In addition, the tolerance values range between 0.704 and 0.816 which are above 0.3. These factors indicate that there is no evidence of multicollinearity problem in the regression model.

In addition to the above VIF and tolerance values, Pearson Correlation Matrix was computed for the independent variable dimensions to check correlation between them. It is clearly interpreted below in Table 4.

Table 4. Pearson correlation matrix

Variables	Pearson Correlation		
	TF	OF	EF
TF		0.507	0.489
OF			0.523
EF			

By reference [57], a value of 0.3 and 0.9 suggests high correlation between the variables. The results in the above Table 4, are all between the ranges and thus suggest high correlation between the variables. Therefore, these findings also show that there is no evidence of multicollinearity

problem. The results of testing the three hypotheses regarding the effect of TOE framework on the intention to adopt Cloud computing are presented in Table 5.

Table 5. Study model summary

Variables	R	R ²	F	Sig (f)	β	t	Sig (t)
TF	0.521 ^a	0.218	26.578	0.000 ^a	0.211	2.918	0.004
OF					0.201	2.380	0.014
EF					0.207	2.840	0.005

^aPredictors: (Constant), TF, OF, EF; ^bDependent variable: Intention to adopt cloud

According to Table 5, there is a positive correlation between TOE framework and the intention to adopt Cloud computing since the multiple correlation coefficient is 0.521. The adjusted R² relates to the generalizability of the model. It allows us to generalize the results taken from the respondents to the whole population. According to the results shown in Table 5 the R² value is 0.218. The results showed that F-ratio for these data is equal to 26.578, which is statistically significant at $p < 0.05$. Hence, there is a statistically significant effect of TOE framework on the intention to adopt cloud computing in private hospitals in Sri Lanka. The β indicates to the individual contribution of each predictors (independent variable) to the model, if other predictors are held constant. Table 5 shows the standardized coefficients for each TOE framework dimension.

The values of β for Technology Factors (TF), Organizational Factors (OF), and Environmental Factors (EF) are 0.211, 0.201 and 0.207 respectively and are all positive. The level of effect of these variables depends on the β value, the higher β value the higher the effect on the dependent variable. It can be concluded from the values of beta that the variable has the highest contribution in the model is Technology Factors, followed by Organizational Factors and finally the Environmental Factors.

6. Discussion and Conclusion

The main objective of this research was to determine if the factors recommended by the TOE framework to determine the effectiveness of hospitals to adopt new innovations such as Cloud computing, particularly in the country of Sri Lanka where healthcare institutions cared tremendously about any new innovations in technology that might support in the enhancement of healthcare services provided. The results of the study indicated that the three factors proposed by

the framework (Technology, Organization, and Environment) played a role in the decision to adopt cloud computing in Sri Lankan private hospitals, particularly in Colombo district. The first hypothesis of this study states that “Technology Factors do not influence the intention to Adopt Cloud Computing in private hospitals in Sri Lanka, particularly in Colombo district”. This hypothesis was rejected; it was found that the Technology had a positive significant impact on the intention to adopt cloud computing.

Moreover it was found that this factor had the most impact on the decision of adopting this new innovation. This result supports the findings of other researchers such as [5] [29] [23] [30]. This may be attributed to the dimensions of the technology factor, where it has been suggested that when firms perceive a relative advantage from an innovation, they are likely to adopt it [33]. Cloud computing technology has various advantages such as low cost, mobility, flexibility, and resource sharing. Cloud computing services can make organizations more effective [30]. The complexity of the Cloud computing adoption has a major role. Many companies have some concerns and fears about investing in new information technology innovations.

Compatibility is one of the key factors to take into consideration when adopting cloud computing. It is crucial to understand if the technology is compatible with the current infrastructures in the organization and if the technology is compatible with current values and needs of adopters [23]. Reference by [58], Cloud computing must be compatible with companies’ policy, IT development environment, and business needs. Hence, steps must be taken to change the processes that are compatible with the cloud solutions in the organization’s infrastructure. However, researchers such as [43] and [12] stated that compatibility was not considered and crucial motivational for cloud computing adoption.

The second hypothesis stated that “Organizational Factor do not affect the intention to Adopt Cloud Computing”. Results showed that the organizational Factors did have an influence on the decision to adopt cloud computing. In this study, Organizational Factors included top management support and technology readiness. As suggested by previous studies [60] [42] these factors could affect the process of adoption new technology. Studies witness that top management support has significant influence on the adoption [61][62]; without top management support, organizations are less likely to adopt new technologies. This suggests that the supportive

behavior of top management may be an important driver in influencing adoption strategies and outcomes [24].

Furthermore, the technology readiness of organizations has positive influence on the adoption of cloud computing; the more readiness organization has, the more intention to adopt cloud computing [50]. The findings of this study were supported by those of references [24] [29]. This is mainly because organizations with high technological readiness are aware of current IT infrastructure potential and limitations and are willing to provide adequate training to enable the skills need to adopt cloud computing. Consequently, organizations that have technological readiness are better prepared for adopting cloud computing [43].

The third hypothesis, Environmental Factors do not influence the intention to Adopt Cloud Computing, was rejected as this factor was found to have a positive impact on the decision to adopt cloud computing. Reference [12] [29] and [84] agree with the findings of this study. These indicates that companies facing strong competition are more actively implementing the changes and are quick to operate in a competitive environment. When competitors implement cloud computing as a competitive tool, other organizations face strong competition and thus feel pressure of adopting cloud computing so as to maintain a competitive edge. Tough competition forces organizations to shift to cloud computing [64].

Trust is one of the key factors to take into consideration when adopting cloud computing. With a high level of risks and existing uncertainties in the Internet environment, trust is a critical factor and it is important for online interaction success [47] [48]. Building trust is a core requirement for establishing new relationships concerning security, confidentiality, integrity, non-repudiation and trust, especially in an online virtual environment. There is a misguided understanding that equates online trust with underlying security requirements [49]. Security requirements include authenticating users or Web sites and ensuring the confidentiality and validity of online interactions. Those issues must be satisfied. In other words, sufficient trust must be established for any relationship to deliver the desired business value [47] [49]. However, researchers such as [48] and [49] stated that trust was considered and crucial motivational for cloud computing adoption. Therefore, trust has positive effect on information technology adoption and this may lead organization to have a strong trust in service provider of Cloud computing.

Trading partner power also has a positive effect on IT adoption decisions; this power can be either convincing or compulsory. Firms which adopting cloud computing technology are depending on whether they have been influenced by convincing power or through compulsory power, whereby the firm that has more bargaining power has requested that the firm with less bargaining power adopt cloud computing [6]. To work better, cloud computing technology requires full cooperation of all business partners, therefore, cloud computing adopters' organizations form working networks with all participants so that the needs of customer requirements can be satisfied[11].

Considering the above facts, this study make an effort to test the suggested adoption model presented in Figure 1 (TOE model). The results of this research proved that the three factors of this framework (Technology, Organization and Environment) are connected to each other and have a significant impact on the decision of organizations, especially private hospitals in Sri Lanka, to adopt Cloud computing.

The most important factors that influenced the intention to adopt cloud computing was the Technological factor followed by the Organizational factor, and finally the Environmental factor. Theses research findings are important to ICT managers as well as providers to make decisions. Moreover, findings can help in developing plans for cloud computing adoption in hospital industries. For ICT service providers, the research model can help them to understand clearly how and why hospitals in Sri Lanka, particularly private hospital in the Colombo district, choose to adopt cloud computing services. In addition, companies can evaluate how complex the service is and how it can be applied to their systems and how to implement them. While researching to maintain excellent cloud computing in other areas, this paper can be used as a base for future research. Furthermore, in many countries, particularly in hospitals, not only sought to acquire cloud computing, but further research should be made to generalize the results of research in Sri Lanka.

7.0. References

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