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THE ORGANIZATIONAL CRITICAL SUCCESS FACTORS OF CLOUD COMPUTING IMPLEMENTATION

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ABSTRACT: Cloud computing is an emerging new computing model for the organization to support business process solution and the result of a successful information system. With the enormous growth of users, services, business contents and resources, information systems are facing the challenges of optimizing resource allocations, dealing with energetic concurrency demand, handling rapid storage growth requirement and cost monitoring. This paper contributes to the literature on cloud computing concepts and exploring the issues associated with its acceptance by the business organization. The aim of this paper is to specify the Critical Success Factors (CSFs) for cloud computing implementation in the business organization. The results on the CSFs was grouped into four factors; Organization, Environment, Technology and Decision Maker Characteristics. Each of these four factors includes several important elements that can assist to enhance the implementation of cloud computing service in the business organization. Besides, this paper also aims to investigate the business benefit gained by implementing cloud computing in the firm as well as the key challenges of cloud implementation in business.

Keyword: Cloud Computing, CSF, Environment Sustainability.

1. INTRODUCTION

Cloud computing is a new paradigm in the implementation of IT resources and business services. It allows users to get vital supplies they need, from business applications to meet the IT infrastructure, including storage of virtual database. This technology could provide significant economies of scale and business agility in a big drought in addition to accelerating the innovation process. Organization with cloud computing service is not managing its IT infrastructure, but instead deliver it to the service provider and use computing resources as required. The difficulties in managing IT infrastructure are handed over to the experts, and organization would be more focused on their core business of delivering value.

This study will discuss on the overview of the cloud computing service to support e-management and e-contents activities. In this paper the key driver of cloud computing implementation will be discussed, emphasizing its potential benefits that would have a significant impact on the organization environment in the future. In this research, a conceptual framework will be proposed as a reference to moving to the cloud computing technology.

2. BACKGROUND OF STUDY

This paper contributes to the literature on cloud computing knowledge and exploring the issues associated with its acceptance by the business organization. Cloud computing elements of the organization, external environment, technology and environmental sustainability are discussed in this paper. The benefits of cloud computing over traditional IT service environment - including flexibility, scalability, reduced capital and higher resource utilization- are considered as reasons for implementation of cloud computing environment. The rest of this paper is organized further into several sections that includes the description of cloud computing service models and deployment models and next, presents the key driver/ factors and benefits for

accepting cloud computing technology. Finally, the conclusions are presented in section 8.

3. CLOUD COMPUTING CONCEPT

Cloud Computing is defined as a business solution in which all resources of computing (hardware, software, networking, storage, and so on) are provided rapidly to users as demand dictates (Masiyev, 2012). In another word, cloud computing is about IT capabilities that are delivered as a service over a network (Jaring Comm., 2012). Garter (2009) described Cloud Computing as a service that offers IT capability with huge expansion power to distinguish external stakeholders such as servicing customers through the Internet services. Specifically, the definition of cloud computing includes all-inclusiveness of multiple solutions provided in a one single service from Cloud Computing vendors (hardware, software, infrastructure, operations systems, etc.). Secondly, remote access by users of cloud computing do have access to their data via a remote connection and next is rapidity, or computational resources are available anytime by request (Masiyev et al., 2012). With this definition, cloud computing has potential to provide high availability and ease of access to new IT consumers (Cruz Marta et al., 2011). This service includes data access, software, and storage in which the physical location of a system that delivers the services may not be transparent to the end users (Dikaiakos et al., 2009).

Cloud computing is a new infrastructure deployment environment that delivers on the promise of supporting on-demand services like computation, software, and data access. The technology services operate in a flexible manner by scheduling bandwidth, storage and compute resources on the fly without requiring end-user knowledge of the physical location and system configuration that delivers the service (Nandgaonkar & Raut, 2014). Cloud computing business solutions are powerful instruments designed to realize this idea in the form of services. Hardware and software, infrastructure and platform solutions could be offered as a single service accessible via the Internet. Giants organizations like Amazon, Google, Cisco, IBM, Oracle and also the Federal Government of the United States, have defined their strategies to implement cloud computing solutions in business, public and government sectors to deliver efficiency, agility, and innovation (Masiyev et al., 2012).

3.1 Cloud Computing Service Platform

There are three different types of Cloud Computing services which are delivered to clients depending on their needs. Cloud services model could be divided into three types of services, namely, Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as Service (IaaS). Figure 1 shows the model of cloud-computing service delivery by Jaring Communication, Malaysia.

3.1.1 Software as a service (SaaS)

Cloud application services, or Software as a Service (SaaS), represent the largest cloud market and are still growing quickly. SaaS uses the web to deliver applications that are managed by a third-party vendor and whose interface is accessed on the clients' side. A business application service delivered to end user remotely or via the internet (Jaring Comm., 2012 & N. Sultan, 2011). The most related and subscribed SaaS by most businesses is Google applications such as Gmail, Google Docs and Google Apps (Hussein et al., 2013).

3.1.2 Platform as a Service (PaaS)

Cloud platform services, or Platform as a Service (PaaS), are used for applications, and other development, while providing cloud components to software. The service of application development and deployment platform delivered as a service (Jaring Comm., 2012). This model operates at a lower level of abstraction comparing to SaaS. Among the services offered to customers is to develop, deploy and maintain applications based on cloud infrastructure. Developers could write their applications according to the specifications of a particular platform without needing to

worry about the underlying hardware infrastructure (IaaS) (Masiyev et al., 2012).

3.1.3 Infrastructures as a service (IaaS)

Cloud infrastructure services, known as Infrastructure as a Service (IaaS), are self-service models for accessing, monitoring and managing remote data center infrastructures, such as a computer (virtualized or bare metal), storage, networking, and networking services (e.g. Firewalls). Instead of having to purchase hardware outright, users could purchase IaaS based on consumption, similar to electricity or other utility billing. In this type of services, enterprises may keep their data and may use the processing and storage that is initially provided by their data center. Enterprises may utilize the computational power based on their demand for Amazon web services (Sultan et al., 2011). This service provided to the user to great infrastructures such as a server, storage and network capacity with associated software delivered as a service (Jaring Comm., 2012).

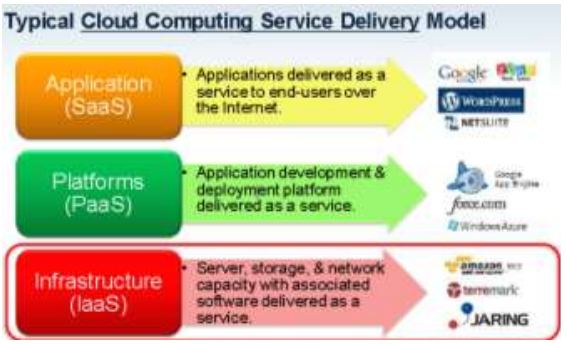

Figure 1: Cloud Computing Devery model

Source: Jaring Comm, 2012

3.2 Type Of Cloud Computing

Types of Cloud Computing could be classified and deployed to end customers as Public, Private, Community or Hybrid clouds. Organizations choose deployment models for IT solutions based on their specific business, operational and technical requirements.

3.2.1 Public clouds

Public clouds are cloud services provided by third parties, but hosted and managed by the service providers. Providers are responsible for installation, management, provisioning and maintenance. Customer's access and use the services and physical resources and are charged only for the resources and services they use (Masiyev et al., 2012). Examples of the public cloud service provider are firms such as Google that service the needs of diverse companies (Anandarajan & Arinze, 2010; Orange & Cohen, 2009). The public cloud could be classified as the most insecure model, but is also the cheapest one (Lim H. S. et al., 2013).

3.2.2 Private clouds

The private cloud is where computing architectures are built, managed, and used exclusively by a single enterprise using a shared services model with the variable usage of a common pool of virtualized computing resources (Hailu et al., 2012). The service implies that the security level of private cloud is very high, but also is the most expensive one (Lim H. S. et al., 2013).

3.2.3 Hybrid clouds

Hybrid is a combination of Private and Public Clouds. They combine on-demand external capacity with on-premises resources and in-house compliance. In this case, the management responsibilities are often split between the enterprise and the public cloud providers, which could often become an issue of concern (Masiyev et al., 2012).

3.2.4 Community Cloud

It could be considered as the extension of private cloud just that the resources and services are shared among those specific firms that have common interests (Bayrak et al., 2011). National Institute of Standard and Technology (NIST) proposed a fourth type of Cloud; the Community Cloud. They define a community cloud which is managed and used by a group of organizations that have shared interests, such as specific security requirements or a common mission. It could take years to build a working

community for sharing and mutual learning. However, the added values and benefits for the Academic Community could be worth far more than the time and effort spent.

4. CLOUD COMPUTING BENEFITS IN BUSINESS

Cloud computing, as aforementioned, is an efficient solution to an ever existing problem of complexity of information systems within the business domain. If left unmanaged, the complex nature of technologies rises rapidly leading to an, even more, misalignment between business and reporting techniques. In this case, cloud computing offers clarification (simplifications) or complexity reduction. By virtualizing the infrastructure, getting resources (either hardware or software) as a remote service, organizations could significantly reduce the level of complexity and count on higher cost cutting. Cloud computing offers a different way to procure and use software and computing services. The continuing evolution of technology will enable cloud computing to make possible a complete breakthrough in the way IT services are provisioned and consumed. Improvements in security, bandwidth, technology standards and virtualization will motivate (motivate who? Users? Public?) to use cloud computing more frequently.

The National Institute of Standards and Technology (NIST) describes the essential characteristics of cloud computing as on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service. The expected benefits of embedded cloud computing services in business to increase business agility includes the following;

4.1 Cost reduction/savings

Cloud computing implementation in business could bring a massive cost reduction in the investment for hardware and software resources, reducing ongoing operational, upgrade and maintenance costs (Preciado et al., 2010; Bayrak et al., 2011 & Nezhad et al., 2009). According to Bhatia, I., and Lala, A., (2012), cloud system can acclimatize to changing consumer behavior and reduce the cost of infrastructure protection and acquisition. The upfront cost to run the system on the cloud is very low. The cost savings will be able to support an emerging company with a minimum investment in IT.

4.2 Scalability and flexibility

The cloud consumers could dynamically scale up and down or even turn off the cloud facilities and services according to their business requirements, demands and needs (Preciado et al., 2010; Bayrak et al., 2011; Masiyev et al., 2012; Nezhad et al., 2009 & Armbrust et al., 2010).

4.3 Accessibility and mobility

The cloud provides a wider range of accessibility and mobility to access the resources and services provided by the cloud service provider (Armbrust et al., 2010).

4.4 Elasticity

According to Bhatia and Lala, (2012), simultaneously, many users can store the data, and there is no foundation of the limit of space in the form of hard disks and thus user's capability to save data increases. It is an essential core feature of cloud systems and circumscribes the capability of the underlying infrastructure to adapt to changes, potentially nonfunctional requirements like the size of data supported by an application, number of concurrent users, etc. Elasticity does allow the dynamic integration and extraction of physical resources to the infrastructure. While from the application perspective, this is identical to scaling (Lamba & Singh, 2011).

4.5 The quality of service

Service quality is the important part in most of the cases where specific requirements have to be met by the outsourced services and resources (Lamba & Singh, 2011; Bhatia & Lala, 2012).

4.6 Focus on the core business

The internal collaboration in a company could be increased and improved because of the capability to access the cloud

application and data at anytime, anywhere through different devices (Bayrak et al., 2011; Armbrust et al., 2010). This benefit would allow a business to adapt to market opportunities quickly.

4.7 Access to better IT resources

The cloud infrastructure is very powerful and able to lead to process efficiency to business (Bayrak et al., 2011; Armbrust et al., 2010). This condition could create a better internal coordination within an organization.

Availability: Availability of services is the important capability of cloud systems. The ability to introduce redundancy of services without any failure is very important

4.8 Reduce power consumption

Cloud has a little impact on environment facet because the improvement of energy efficiency may contribute to the reduction of total carbon emissions in a substantial way (Federico, 2010).

4.9 Integration

This problem most likely occurs when a company is trying to migrate their legacy system into the cloud (Bayrak et al., 2011; Masiyev et al., 2012; Public CIO, 2009). The cost associated with this type of integration is extremely high and requires intensive resources. However, the final result of this integration could create one unified, interoperable system that has a better management and control regarding business process workflow, work quality, human resources and so on.

4.10 Cost in practice

Implementation of cloud computing in business could lead to cost savings for a company. However, some researches prove that the cost could also be one of the obstacles to adopting cloud (Masiyev et al., 2012; Public CIO, 2009). The reasons might be due to some people who belief they could save more cost by adopting conventional methods to run their business instead of taking the cloud approach, lack of knowledge about the cloud, and the list goes on.

5. CRITICAL SUCCESS FACTORS (CSFS) OF CLOUD COMPUTING IMPLEMENTATION

The term Critical Success Factor (CSF) is the component that needs to be considered and analyzed when there is an interest in an organization because it is deemed more successful than others, and inquiries made to run components of success. It is a critical factor or activity required to ensure the success of the implementation process in an organization (Rockert, 1978). To understand the determinants of cloud computing initiatives at the organization, a research survey was done by the Global Cloud Computing Implementation in Jan 2011. Figure 2 showed the statistical result of the survey where there are eight elements related to organization implementation decision. Various drivers of the cloud industry are summarized in Figure 2. Industry regulatory changes Drivers of Cloud Computing Initiatives at Organization. Base: 636 Total respondents; 234 US respondents; 202 EMEA respondents; 200 APAC respondents.

Figure 2: Source - CIO Global Cloud Computing Source: Adoption Survey January 2011 (Jaring, 2012)

Therefore, CSFs are all elements that must be done if a company is to be successful in technology implementation. Researchers identify four aspects of a business context that influence the process of implementation which is technological, organizational, environmental and decision maker characteristics. Technological context describes both

the internal and external technologies relevant to the organization. Organizational context refers to descriptive measures about the organization such as organization scope, size, and managerial structure. Environmental context is the external influence in which an organization conducts its business; the industry, competitors, and dealings with the government. Decision Maker awareness is referred to the awareness of organization owners on the importance of environmental sustainability for social value.

5.1 Technology Context

5.1.1 Cost effectiveness

Cost is claimed as a critical issue in implementing cloud computing technology in organization (Ali, Soar, & Yong, 2015; Bedward & Fokum, 2014; Chang, Walters, & Wills, 2011; Jelonek, Stepniak, Turek, & Ziora, 2014; Rahimli, 2013; Raza, Adenola, Nafarieh, & Robertson, 2015; Sultan, 2010; Tarmidi, Rasid, Alrazi, & Roni, 2014). The bigger the size and scope of the organization, the greater the demand for IT investment. Consequently, that firm size is a big influence to cost investments in new information technology implementation. As highlighted by Saidhbi (2012), Cloud Computing is an advanced technology that reduces both IT costs for the organization and remove many of the time limitations for big number user in the organization. According to an investigation by Dahlstrom, & Bichsel (2014), the funding crisis in higher education is placing pressures to the organization to make the available cost stretch as far as possible so as not to reduce services.

Several alternatives may help the organization in reducing their cost if they are prepared to make the changes that would truly deliver efficiency. Those alternatives include centralizing IT services and system, purchasing a scale; outsourcing services, platform and infrastructure and standardizing business process(Applied, 2012). Benlian (2011) highlighted that cost effectiveness is the strongest driver affecting IT decision maker when deciding to adopt cloud computing service opportunities. In general, company nowadays always looks for ways to cut cost or save money. Cloud computing service is expected to cut or eliminate ICT cost and decrease the operational cost for server infrastructure, software and labor related, e.g., technicians(Alkhanak, Lee, & Khan, 2015; Liang, 2012; Rastogi, 2010; Ross & Blumenstein, 2013; Saidhbi, 2012). Moreover, a considerable proportion of the costs of operating an IT infrastructure obtains from electricity energy consumption that needed to operate hardware and cooling device that needed to reduce heating produced by the related computing devices (Alkhanak et al., 2015).

5.1.2 Security

Security is one of the important concerns of the organization, particularly when the data goes out of organization local networks (Kotwal & Singh, 2012; Sabi, Uzoka, Langmia, Njeh, & Han, 2016; Stieninger, Nedbal, Wetzlinger, Wagner, & Erskine, 2014). This factor is in the same view with the research published by (Al-Anzi, Salman, Jacob, & Soni, 2014; Alshamaila, Papagiannidis, & Li, 2013a; Britto, 2011; Ghumman & Lässig, 2013; Kotwal & Singh, 2012; Low, Chen, & Wu, 2011; Nandgaonkar & Raut, 2014; Panneerselvam, Liu, Hill, Zhan, & Liu, 2012; Raza et al., 2015; Sabi et al., 2016; Stieninger et al., 2014; Sultan, 2010; Tanimoto et al., 2014). Researchers agreed that the security issue is the topmost issue that manages the acceptance of cloud computing in an organization. The Success of a cloud computing provider is the ability of their service to provide effective security protection for organization file and data (Chalse, Selokar, & Katara, 2013).

5.1.3 Reliability

When organizations have the intention and willingness to implement cloud computing technology in their operation management, they should consider the factor of reliability (Al-Busaidi & Al-Shihi, 2010; Chang, Kuo, & Ramachandran, 2015; Lamba & Singh, 2011; Rahimli, 2013; Ramayah & Lee, 2012; Raza et al., 2015). Rahimli (2013), identified the reliability as the quality of being dependable or reliable. High reliability is predicted, with the capability and minimum downtime and to ensure constant

operation of the system without disruption or failure free working (Chowdhury & Tripathi, 2014; Rahimli, 2013). These factors could be attractive to users and organizations that depend on quick response activities (Nowicka, 2014). Hence, the reliability of cloud computing is based on the reliability of the specific resources of cloud elements. Reliability is the benefits that relate to the quality of systems that are crucial to cloud computing success (Kantarcioglu, Bensoussan, & Hoe, 2011; Rahimli, 2013). This factor must be returned, with a minimum of failure in the cloud computing system to be an excellent business support (Armbrust, Joseph, Katz, & Patterson, 2009). Therefore, the organization may stand to benefit, when implementing a cloud computing service strategy for the education management system, given the potential for improving services, monitoring costs, and providing greater reliability (Alkhanak et al., 2015; Goldstein, 2009).

5.1.4 Speed Performance

Low et al., (2011) stated that quality of technology could be measured using speed as an element that representing the speed of business operation, efficient management, good customer communications medium and access to mobile information in the market (Benlian & Hess, 2013). Based on the experiment by Bhatia and Lala(Bhatia & Lala, 2012), the most important need of cloud computing is high-speed connectivity of the internet. The principle of cloud computing services is placed in another part of the world as recovery of data center and it could impact positively toward the performance of the virtual system. Even though cloud technology service might experience a delay in the service (Hailu, 2012a; Kim, Kim, Lee, & Lee, 2009), but the issues must also be viewed in detail at the premises internet infrastructure challenges. The findings of the study confirmed that the slow internet connection causes performance difficulties. Therefore, speed performance is one of the challenges of cloud technology implementation and organizations must have a high speed of Internet and network connection which would reduce connection problems (Kotwal & Singh, 2012).

5.1.5 Complexity and Compatibility

Complexity and compatibility are the extents to which members of organizations have higher levels of cloud computing knowledge (Roger, 1995). According to Taut (2009), complexity could be reduced with Cloud Computing and research by Low et al., (2011), resulted that complexity and compatibility were not an important factor to influence technology implementation, and this finding is consistent with previous research by Oliveira, T. & Martins, (2011) and Stieninger et al., (2014) . The factor of compatibility is derived from Rogers' in DOI theory. It is the level to which an innovation is viewed as consistent reforms with the values of experience and needs of the potential system. Thus, increased of compatibility influences the implementation intention and the real implementation of cloud computing in a positive direction (Low et al., 2011; Nasrin, Razak Ab., & Halina, 2014).

5.2 Organization Context

5.2.1 Recovery Planning and business continuity

Recovery planning of data and business continuity could be of critical importance in the decision to implementing cloud computing (Ali et al., 2015; Bedward & Fokum, 2014). Cloud computing services must be planned with all kinds of disaster recovery strategy. One of the strategies is applying the backup system in the data center so that organization is capable of continuing their business after the disaster occurred (Mohammed & Ibrahim, 2015). Cloud computing service providers need to plan service implementation at several different locations or even countries(Bedward & Fokum, 2014). In practice, cloud service providers have strategies on multiple storages based on the geographical location so that service is closer to the users53. Nevertheless, a cloud service provider would be able to advise or find out what happen to the data and service in case of disaster.

5.2.2 Governance and Policy

Top management plays a major role in creating, supporting and providing sufficient resources for implementing new technologies. This process may involve the integration of resource and re-engineering of the business model. These issues run the range from audit to process management, IT governance, regulatory compliance, IT security, and accountability for access management, e-discovery, privacy and protection of research results (Palacios-Marqus, Soto-Acosta, & Merig, 2014). Governance involved management of tactical, operational and strategic model that defines the way organizations structure to establish their goal, make decisions and allocate resources (Islam, Mollah, Huq, & Ullah, 2012). An organization governance influences its adoption of electronic business and institutionalization (Wei & Blake, 2013; Bedward & Fokum, 2014; Cegielski et al., 2012; Chang et al., 2015; Palacios-Marqus et al., 2014; Rastogi, 2010; Tashkandi & Al-Jabri, 2015). A study on cloud computing framework by Chang (2015), identified that loss of management and control over resources which might lead to unclear roles and responsibilities. Chang,(Chang et al., 2011) suggest the organization to clear up the roles and responsibility before migration to cloud computing implementation. The organization policy also influences the decision making of organization leader, which must be embodied in a contract with the cloud provider (Alabbadi, 2011).

5.2.3 Knowledge Awareness

Knowledge awareness refers to an organization projection, perception, and comprehension of the value and risk of technology implementation (Shimba, 2010). Most researchers used DOI theory by Rogers, (1998) to recognize awareness as an important aspect of implementation computing technology (Ali et al., 2015; Alshamaila et al., 2013a; Bedward & Fokum, 2014; Cegielski et al., 2012; Gutierrez, Boukrami, & Lumsden, 2014; Sabi et al., 2016; Tarmidi et al., 2014). Based on the above results, it could be concluded that the awareness rate of Cloud Computing among the Malaysian Small Medium Enterprise (SMEs) is still low or unsatisfactory? especially in e-Business implementation. The awareness was recommended to be included in the implementation process to accelerate the cloud computing implementation of daily business operation.

5.2.4 Top Management Support

The organizational context which includes elements such as firm size, human resources quality, and complexity of the management structure, plays a significant role in the success of implementation (Abdollahzadehgan, Che Hussin, Gohary, & Amini, 2013; Abubakar, Bass, & Allison, 2014; Alshamaila, Papagiannidis, & Li, 2013b; Gutierrez et al., 2014; Low et al., 2011; Oliveira, T. & Martins, 2011; Rahimli, 2013). A study in developing countries by Hailu, (2012a), indicates that management commitment is a key factor in IS development failure. Therefore, commitment affecting the support and energy shown by decision makers of the organization are needed to be a success in technology implementation. This is the main challenge in implementation strategy especially to receive sufficient financial investment and technological competencies. The willingness of top management to understand business-related benefits of cloud computing and competitiveness, and to implement it in the organization are also important (Alshamaila et al., 2013a; Goel & Yang, 2015). IT top management is responsible for training their employees for cloud computing knowledge matters so that it could be effectively implemented in the organization and to improve their performance to achieve business objectives. Indirectly, the trained employees, supported by organizational resources, understand the usefulness of cloud computing and find easiness of utilizing their duties using cloud computing.

The environment is one of the aspects that is taken directly into consideration in the decision-making behavior of the organizations (Oliveira, T. & Martins, 2011). The external environment is commonly used because internal environmental aspect is applied within an organization.

Consequently, to be detailed, the external environment includes relevant elements outside the boundaries of the organization which is outside organization's control, but very important in decision-making behavior[10]. In the environmental context, market forces/ support refers to the other body of the customer, supplier, trading partner, competitors and government pressure that significantly influence requirement to practice technology. According to several studies, this factor was statistically a major factor for cloud computing implementation in organizations (Abdollahzadehgan et al., 2013; Hossain & Quaddus, 2014; Mohammed & Ibrahim, 2015; Tashkandi & Al-Jabri, 2015).

5.3 Environment Context

5.3.1 Competitive pressure

Competition in the business is usually perceived to affect the IT implementation positively especially when technology directly affects the competition, and it is a strategic necessity to implement new innovative technologies to compete in the market. This situation occurs when the organization feels pressure from competitors within the industry (Lippert & Govindrajulu, 2006; Oliveira, T. & Martins, 2011). The significant and positive relationship between competitive pressure and implementation implies that when competitors implement cloud computing as a competitive instrument, other organizations face strong competition and thus feel the pressure of adopting cloud computing so as to maintain a competitive edge (Goel & Yang, 2015).

When the organization has the physical characteristics of agility and innovative, organization would deal with pressure, challenge and become more aware and emulate their competitor's implementation of latest technologies. Therefore, by implementing cloud computing, the organization is more understanding of operational efficiency, market visibility and more accurate data collection (Misra & Mondal, 2011). Thus, an organization needs to perform better technology implementation than its competitors and to satisfy customer requirements (Li, Wang, Zhang, & Chu, 2010).

5.3.2 Social pressure

Social pressures influence people to adopt new technology, but the social risk issue stating that outsourcing IT by implementation cloud computing service could effect in the job loss and viewed as a failure of the IT divisions in managing their jobs which would impact the reputation of the IT leaders (Al-Somali & Clegg, 2015; Korpelainen, 2011). These social issues also give negative affect toward the implementation decision of Cloud Computing (Goel & Yang, 2015; Oliveira, T. & Martins, 2011). Thus, some IT leaders might feedback negatively to the Cloud Computing technology (Benlian & Hess, 2013).

5.3.3 Trading Partner Pressure

In some situations, many organizations depend on business partners or supplier for IT design and implementation tasks before deciding to migrate their system (Oliveira, T. & Martins, 2011; Tashkandi & Al-Jabri, 2015). Additionally, many firms rely on trading partners for their IT design and implementation tasks (Alshamaila et al., 2013a; Goscinski & Brock, 2010; H. Hsu & Chang, 2013; Oliveira, T. & Martins, 2011). An organization has to face pressure from upstream and downstream business partners, which it would influence a firm to implement new technology.

5.3.4 Government pressure and support

The government has the power to force the targeted industry to achieve the vision of deploying innovation system to gain compliance with the desired practice.(Oliveira, T. & Martins, 2011; Oni & Papazafeiropoulou, 2012). In another situation, government bodies that support to promote technology implementation in the industry and change the organization's business processes which could improve the competitiveness of organizations in the new digital economy(Hossain & Quaddus, 2014). Malaysia government is one of the supporting bodies of the cloud computing implementation project by MDEC for SMEs company's in

Malaysia by providing the incentive of fees to encourage them in technology innovation. Business Software Alliance research resulted in Poland recording the 12th place among 24 countries in the ranking of government policies that have significant impact on the development of cloud computing. Thus, government regulations and policies mean that government support is required for organizations to implement the latest technology (P. F. Hsu, Ray, & Li-Hsieh, 2014).

5.3.5 Vendor support

The source of vendor support comes from cloud computing technology vendors that provide and manage infrastructure, application, and other relative advantages to organizing (Chopra, et al.,2013). Cloud technology providers support is a significant element of the external environment, particularly in the initial stage of technology integration (Misra & modal, 2011; Oni & Papazafeiropoulou, 2012).

5.4 Decision Maker Characteristics

5.4.1 Environmental Sustainability

Decision-maker awareness on environmental sustainability is a key success of the Green Computing project and important concern in the cloud computing implementation. Heat and carbon releases due to widely use of computer devices in premises, electrical waste and energy consumption, is the main drawback of the traditional computing systems and lead to environmental preserving. Cloud computing services have the ability to reduce the issue (Bhatia & Lala, 2012; Chang, 2010; Idris, Anuar, Misron, & Fauzi, 2015; Jadeja, 2012; Lamba & Singh, 2011; Mero & Mwangoka, 2014; Piaralal, Nair, Yahya, & Karim, 2015). Cloud computing providers are specialists able (please restructure this particular phrase) to optimize infrastructure, with never idle servers (Barnatt, 2010). According to Barnatt, the cloud data centers that operates more efficiently, achieving more than 80% use of resources compared with the in data center's premises which operate less than 30% efficiency. The enhancement of resource utilization is accomplished through cloud computing capability to enable a single server to determine several tasks at the same time. Some researchers Piaralal et al., (2015) and Zissis & Lekkas, (2012) suggested a Green Cloud Framework and listed the parts of this technology that contribute to CO2 emissions. Cloud computing provider needs to understand and have the knowledge of the existing power of data center, the power consumption of server resource utilization to minimize electricity energy and maximize efficiency, and cooling infrastructure design.

N. Sultan, (2010), stressed that the cost benefits of cloud computing are not only related to how many users of cloud computing could save costs by not buying and installing computer hardware and software to use so little power. In 2007, Gartner research estimated that the computing technology was responsible for 2% of carbon emissions and is expected to increase in the future. Thus, cloud service is expected to reduce significantly CO2 or other gaseous carbon compounds released into the atmosphere (Alkhanak et al., 2015). Environmental sustainable issues constitute a real concern for the organization as more low and regulations are issued to reduce the carbon dioxide released by them. By migrating of IT functionality into the cloud computing services, organizations do not only minimize their computing technology infrastructure, but also utilize the electron energy in a smart process (Marston, Bandyopadhyay, & Ghalsasi, 2011). Nevertheless, other researchers claimed that cloud data center are consuming a very large volume of power energy and not all cloud vendors advocating the effort to efficient energy consumption (Kim et al., 2009). Thus, migrating to the cloud technology is said to not reduce the global CO^2 emissions.

No	Factors
Environment	Government Pressure/ support
	Trading Partner/Supplier/ Peer Pressure
	Social pressure
	Competitive Pressure
	Cloud Vendor Support
Organization	Cost effectiveness
	Knowledge Awareness
	Policy Governance/ Trust
	Top Management Support
	Business Continuity
Technology	Speed performance
	Reliability
	Security
	Complexity And Capability
Decision Maker Characteristic	Technology Readiness/ Awareness on Environmental Sustainability

Table 1: CSFs for Cloud Comp. Implementation

6. DISCUSSION

This study has the potential to help business organizations in Malaysia make informed decisions about the selection and implementation process pertinent to cloud computing technology service. To extend and promote the cloud computing implementation in developing countries such as Malaysia, there must be a strategic execution. Further analysis of the current cloud computing implementation methodology in Malaysian companies requires in-depth investigation, in parliamentary procedure to obtain a clear apprehension of their implementation status. This research is anticipated to provide a perception of the present state of cloud computing implementation, particularly in a business organization. It also provides a comprehensive guideline for future cloud computing implementation in Malaysia. The findings from the study also would be useful to assess their implementation status and make necessary measures for management improvement. This research could also act as a basis for further research in cloud computing implementation in any industry. Each aspect constructed in the framework could be further studied and confirmed by the actual implementation analysis. In this regard, this study attempted to add to the new body of knowledge about the innovation in cloud computing technology by integrating the system, improve in resource utilization as well as the profit made by the providers. It has been able to contribute to significant economies of scale and greater education agility while accelerating the process of innovation in technology development.

7. CONCLUSION

This paper is based on review of the literature on the basic knowledge and issues related to Cloud Computing, focusing on the background and key implementation area of Cloud Computing. This issue is highly relevant to the industry as the numbers of organizations adopting or actively using Cloud technology is prominent. Understanding Cloud computing usage and it's high significance, supports stakeholders to understand their risk and return analysis and also the extent of added values (such as efficiency, cost-saving, profitability and user satisfactions) offered by Cloud Computing Technology. Technical, organization and environmental factor is the main division of Cloud computing adoption challenges that need a structured and well-organized framework to deal with emerging issues and provide solutions for others.

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