

Effective IS/IT Implementation of Cloud Computing

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ABSTRACT

The purpose of this paper is to present the cloud computing concept, its primary service designs and implementation models. The authors aim to compare the traditional way of how IS / IT is managed and implemented in small and medium-sized enterprises with the idea of cloud computing. The goal of this research is to illustrate the critical economic advantages of embracing cloud technologies and explore their effect on a sector. The authors aim to indicate conditions that influence the ability to use the IS / IT implementation potential effectively via cloud computing. This paper is based on a comprehensive analysis of the business and economic writings regarding the model of cloud computing. To demonstrate the cloud deployment impact for the user company of IS/IT migration writers which hosts large quantities of customer data. The study contrasts the conventional IT supply chain management model with the SaaS model in terms of Total Ownership Cost. Upon setting up TCO, we analyse financial metrics such as net present value, return on expenditure, payback, and extend it to cloud infrastructure projects. The IT deployment process is cost-consuming. Enterprises are continually searching for cost-cutting strategies and avenues to boost their market efficiency. Evidence presented in this paper shows that using cloud storage as an IT system construction tool may have business benefits. Cloud computing's critical advantages over traditional IT infrastructure management are elimination in capital spending, higher productivity in small companies by exposure to the newest technology and applications, shortening time-to-market. Based on the findings of the sample case study of applicable metrics, expenditure in cc solution is of value to the client. The paper should propose decision-making in the actions of small-medium enterprise and discern between potential benefits, real benefits and related risks introduction of emerging technology.

Keywords: *Cloud computing, IT implementation, Cost savings, Business agility, Information Technology*

1. INTRODUCTION

Small Medium organisations trying to face the demands of the business economy and rising standards are continually searching for innovative ways to work in a dynamic climate. Technology and facilities of information technology are essential for the effective operation of businesses. Essential IS / IT adoption capabilities attract both: customers and providers of these solutions. Nonetheless, for market players to achieve the comparative edge, they must engage in a creative approach to doing business. The advent of the widely recognised term of cloud infrastructure marks a significant shift for the application of information system (IS) and information technology (IT). The latest concept reconstructs how to deliver, design, create, repair, manage, and pay for IT services. The key benefits and rewards for embracing cloud-based platforms and technologies are their fundamental features: self-help on demand, flexibility, vast network connectivity, strong elasticity, calculated operation, and market agility.

Cloud Computing:

In a simplified way, cloud computing means storing and accessing data and programmes over the internet, rather than the hard drive of our computer. Cloud computing is Internet-based computing that accesses and uses shared resources (e.g., storage and computing facilities, software, data, applications, etc.) on request in a convenient "pay-as-you-go" manner (Linthicum, 2018). Users get high-quality services at a lower cost in the cloud computing paradigms. Rather than establishing their physical infrastructure, users usually prefer a cloud-based internet service mediator (Rashid and Chaturvedi, 2019). Cloud computing model has drawn immense interest from academia and business, owing to the

theoretical and realistic benefits to community and economy. The acceptance of cloud computing is promptly increasing due to the scalability, flexibility, agility and simplicity that it offers the businesses.

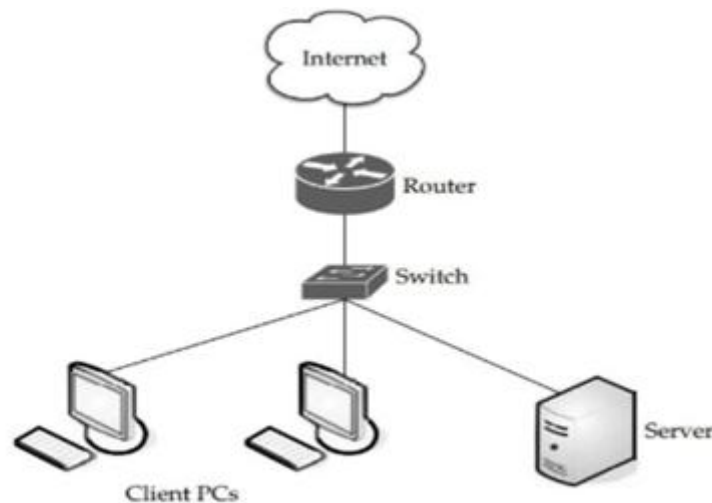


Figure 1: The Internet is portrayed in a network via a cloud(Rountree and Castrillo, 2014)

Cloud storage allows for the utilisation of third-party software, services, and resources without initial cost but with the option to pay when you utilise it, while at the same time allowing freedom to maximise or decrease use based on the corporate requirements. The potential benefits are that you don't need to make a huge upfront investment to build the network or purchase the development tools. Without any initial investment, you can obtain the freedom to use them then pay for them depending on the use.

They may also boost use by choosing for new hardware, extra programming resources, or an increased amount of applications or services to enable more people to access the existing software. (Linthicum, 2018)

Cloud computing's advantage is that consumers may access online infrastructure for their web servers, slim computers, or also devices such as smartphones and tablets. To use cloud resources, they do not require any advanced software or complex system or utilities (Rountree and Castrillo, 2014). Cloud storage will undoubtedly be a blessing for small businesses engaging in a non-critical industry where few confidential details and little transactions are accessible. We could be okay with the occasional loss of communication, or rare data leaks when the advantages exceed the costs.

The essential characteristics of cloud computing are:

- On-demand service:** Cloud resources such as CUP Time, Energy, Network Connectivity, Computer Power, Web Apps etc. may be automatically distributed without human intervention, as needed by customers.
- Profitable:** The cloud service companies have offerings that are rather cost-effective, if not entirely. The payment model is billed as per usage; there is no need to buy the facilities, and hence the operating expenses are reduced.
- Configurability:** the cloud is a multifunctional environment that can be customised and adapted to user demand based infrastructure and applications(Rashid and Chaturvedi, 2019).
- Productive utilisation of energy:** having services only for as long as they are required allows it more comfortable to allow proper use of positive energy(Rountree and Castrillo, 2014).

Cloud Service Models

- Software as a Service (SAAS):** This is a concept of programming being offered over the internet. Customers don't need to lease programming, so developers prefer to rent Web-based programming (Pal, 2019). The strategy will sustainably manage market activities. It is defined as the capability granted to the user to use the software that the vendor operates on a cloud network. It is a kind of cloud infrastructure that offers software functionality over the internet. Specific provider entities create software programmes or products by making significant investments in conceptualisation, study, architecture, growth, and testing.

The customer does not monitor or regulate the underlying cloud infrastructure, including network, servers, operating systems, storage, or even actual device features, with the potential exception of user-specific configuration settings for applications. SAAS provides many advantages for consumers; no subscription charges, maintenance-free, Web connectivity and good quality. The benefit of SaaS is that it's the cloud user that manages the correct device setup. Salesforce.com, justcloud.com, Dropbox, and even other related apps are some of SaaS's examples (Pal, 2019).

- b) **Platform as a Service (PAAS):** The capability given to the user is to deploy into the cloud platform customer-generated or purchased software produced utilising programming languages, databases, facilities, and resources funded by the vendor. The user does not monitor or regulate the underlying cloud resources, including the network, servers, operating systems or storage, but manages the applications installed and likely configuration settings for the application-hosting environment(Kaur, 2016).

PaaS often implies the way things are arranged as a company. Many of the IT industry organisations are involved in developing software frameworks or products, utilities, or tools for software applications. To check their performance, they need the infrastructure to build such software programs, design and development resources, and check tools.

PaaS helps companies to hire systems, applications and services for design, creation and testing at considerably reduced cost and also with a pay-per-use payment system; they may switch from one network to another if they shift direction at any point, based on the need.

- c) **Infrastructure as a Service (IAAS):** The capacity provided to the user is to include computation, storage, networks, and other critical computer services that the customer can deploy and operate arbitrary apps that can involve operating systems and applications. The user does not monitor or regulate the underlying cloud infrastructure, but influences operating systems, storage and installed applications; and likely minimal control over specific networking components (e.g., host firewalls)(Dimitri, 2020).

Every enterprise usually invests heavily in data centres where servers are placed; servers are linked through networks, desktops and laptops are placed with the corresponding client applications, other infrastructures such as physical protection, logical protection like access control are introduced.(Kaur, 2016). It deploys the necessary support services such as IT Managers to System Administrators to assist vendors in supporting systems such as generators, UPS, and other backup mechanisms. Many of which come with a significant initial capital expense and much further operating costs. IaaS reduces hardware expenditure in data centres(Ramdane, 2020).

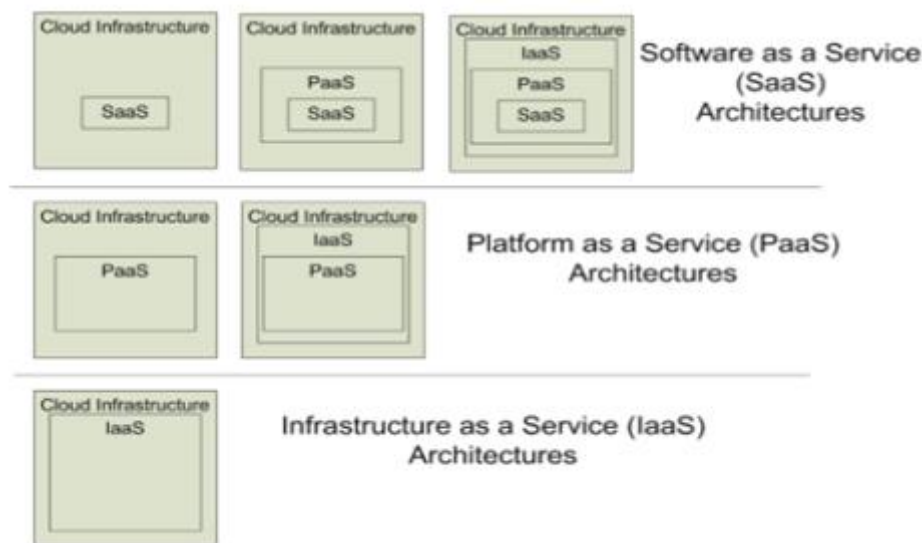


Figure 2: Cloud Computing Service Models (Ramdane, 2020)

Deployment Models:

Models of cloud delivery demonstrate how cloud resources are rendered accessible to customers. The four cloud-based delivery models are as follows:

- a) **Public Cloud:** Public cloud (external cloud) technology is available to the public or a vast business community through web applications as well as internet providers, and is operated by a company that provides cloud services. As the name suggests, this cloud deployment model supports all users who want to use the computing resources, such as hardware (OS, CPU, memory, storage) or software (application server, database)(Kumar, 2019).

Public clouds are the cheapest option in the cloud infrastructure and are available to everyone. Here, the cloud provider leverages the massive infrastructure he can share as he sees fit with a large number of customers. For modern companies with no sensitive data finding a cost-effective approach, a public cloud is ideal for them (Sohail, 2018).

- b) **Private Cloud:** A private cloud is committed and configured focused on their specific high-security requirements for a single cloud user. Nevertheless, private cloud only comes with significant expenditure in infrastructure, as well as high maintenance costs. A private cloud helps the customer to understand the benefits of cloud infrastructure, such as eliminating high initial capital costs, paying as you go, model, best of class software, high-end functionality, and comprehensive and efficient storage capacity without the security hazards of a public cloud system. Organisations can host critical applications on private clouds and applications in the public cloud with relatively fewer security concerns (Kumar, 2019).
- c) **Hybrid Cloud:** An organisation may use a hybrid cloud, a combination of any of the three deployment models mentioned above (Private Cloud, Public Cloud, and Community Cloud). A cloud user can use various implementation models, based on the specific purposes for which the cloud infrastructure is to be used (Chopra, 2017). This can be sought from different cloud service providers. Highly relevant and highly confidential apps can go on the private cloud while non-significant, non-sensitive, standardised apps can go on to the public cloud, and group clouds can service group partnerships.
- d) **Community Cloud:** Such clouds are set up for collaboration and shared interests between groups that contribute to a specific society such as health care, public agencies or social welfare groups. The community is building up these clouds for usage by the organisations inside the organisation. These can be managed by one or more community-owned organisations or can be achieved by a designated outsourced agency or a cloud provider from a third party. The shared configuration of such a cloud takes down the costs of such a system to the growing company while at the same time giving all partners the advantages of the cloud. Nonetheless, cyber management can also be a problem because many companies may utilise the cloud and do not have the requisite protection skills from the cloud provider (Gritzalis, 2018).

2. TRADITIONAL VS CLOUD COMPUTING

In the traditional paradigm, the company which wants to run on its own IT infrastructure is required to bear the costs of purchasing servers, network equipment, applications etc. at the outset of its service. Given by this capability of the computer (disc space, computing power) for a specific time-space cannot be exploited at the limit. (Sadowski, 2012) Further growth of the business could require consumer need to invest in additional infrastructure in the next time. This could also happen that the growth of the market may be quicker than anticipated, and available this capital may not be adequate to guarantee an acceptable degree of IT operation even after growing their capacity. Faulty IT equipment leads the business to potential damages request for goods and services. The market has reduced profits and would undoubtedly report annual results decline. Observing the increasing demand for the product, these resources again carry the necessary expenditure. The company's reaction could be a little late, which may harm the brand profile. Regarding the periodicity that exists on the sector, it should be expected that the amount of demand for the company's commodity would drop to the point before the fast development over a particular cycle of time. The capacity of the built network would be mostly untapped, although operational costs associated with the management of the services would remain effectively untapped unchanged at a reasonably significant level.

Business experience demonstrates that businesses will remain in a healthier situation than their rivals, who are willing to respond to evolving circumstances in the short term. Inability to adapt the exponential rise in demand (the skill to accommodate an increasing amount of consumers in a limited time), typically results in their defeat. Contractors switch to the firms that will satisfy their demands, which usually involves weakening their business place with the company. Companies which base their operations on the model of the conventional use of IT resources might be in the situation retrieved above.

One approach that reduces the negative consequences of the mentioned transition is to handle the cloud infrastructure paradigm with asset IT. Companies who transfer their IT capital to clouds after a short period start gaining tangible economic benefits. First of all, beginning business operation, the company is not required to spend in network growth and therefore produce savings. In comparison to the standard model where the investment returns naturally at a far later time, the initial costs incurred returns very soon. Thus there is no reason to spend on new hardware and applications, for the improved upkeep of IT infrastructure. The cloud service provides the user with a high degree of scalability along with the prospect of efficient resource management, as competition for it already occurs. It avoids the scenario that would arise in the conventional model where own IT services cannot accommodate sudden unforeseen demand spikes.

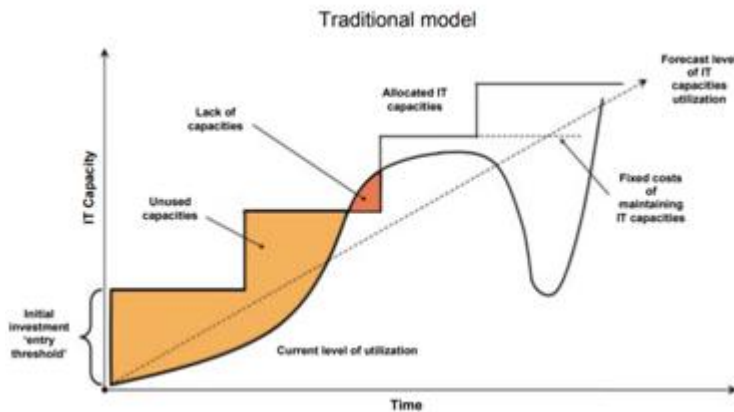


Figure 3: IT capacity in the Traditional Model (Sadowski, 2012)

Further growth of the business could require consumer need to invest in additional infrastructure in the next time. This could also happen that the growth of the market may be quicker than anticipated, and the required this capital may not be adequate to guarantee an acceptable degree of IT operation only though they have expanded their capacity. Faulty IT equipment leads the business to potential damages request for goods and services. The market has reduced profits and would undoubtedly report annual results decline. Observing the increasing demand for the product, these resources again carry the necessary expenditure. The company's reaction could be a little late, which may hurt the brand profile.

Regarding the periodicity that exists on the sector, it should be expected that the amount of demand for the company's commodity would drop to the point before the fast development over a particular cycle of time. The capacity of the infrastructure built would be mostly untapped, as the running costs associated with the operation of these will stay virtually unchanged at a reasonably high level. Contractors switch to the firms that will satisfy their demands, which typically involves weakening their business place with the company. Companies who focus their activities on the conventional IT resource management model that find themselves in the situation mentioned above (Kang, 2012).

One approach that reduces the negative consequences of the mentioned transition is to handle the cloud infrastructure paradigm with asset IT. Companies who after a short time migrate their IT capital to the cloud starts to gain tangible economic benefits, First of all, beginning business operation, the industry is not required to spend in infrastructure growth, and therefore savings are created. In comparison to the standard model where the investment returns naturally at a far later time, the initial costs incurred returns very soon. Therefore there is no reason to spend on new hardware and applications, for the improved upkeep of IT infrastructure. The cloud service provides the user with a high degree of scalability along with the prospect of efficient resource management, as competition for it already occurs. This avoids the condition that may arise in the conventional model, where own IT services cannot be utilised.

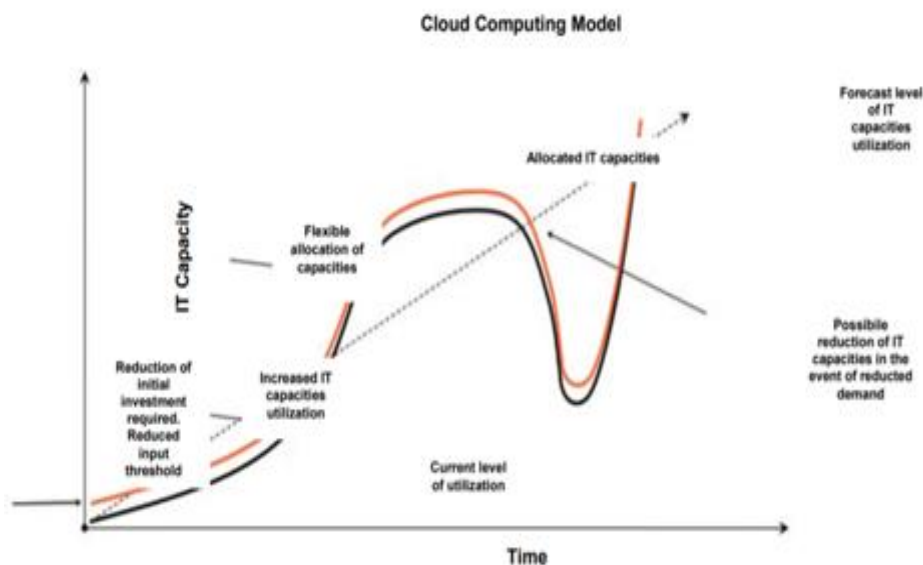


Figure 4: IT capacity in Cloud Computing Model (Sadowski, 2012)

Therefore the introduction of cloud storage systems eliminates the chance of reducing lost sales and consumer withdrawals. Consequently, versatility in adapting to consumer demands may be a strategic advantage.

3. RACE TO TOP VS SERVICE VALUE

Cloud Computing's role, although initially viewed as a transformative platform that affects both buyer and seller opportunities, is now transforming into a trade-off between low-cost arbitrage and value-added service efficiency (**Open group, 2020**). The words "race to the edge" or likewise "the puzzle of the convict" apply to the competitive pressure by competitors in a competition motivated by the desire to achieve the most significant cost savings. The concept is also interpreted in a derogatory way because the reduced prices and earnings are perceived as unfavourable to the participants. Cloud storage companies' increasingly flexible offerings had the impact of bringing down costs and profits, as the complexities of pricing are changed by the emergence of possibly exponential rate cuts and significant data centre investments. The counterbalance to this is the Standard of Service and the related Expense of that Service that characterises the cost-benefit per unit of production delivered (see a debate on the Financial Interest context of Switching from CAPEX to OPEX and Pay-as-you-go).

Cloud Computing's differentiator is not only software technology for the utility system, which also all the higher-level resources that improve and create demand for business operation. We see that as the impact and scale of the transition from IT-centric to business-centric infrastructure through a broader spectrum of resources, with network utility tools at one end and market-centric information and business processes provided as a cloud application at the other. However, attention will be given to the need to have sufficient protection. Consumers are happy to spend a little bit extra for a company if they are told that adequate protection procedures would be in effect. This issue is highlighted in this White Paper because it has a direct bearing on the ROI debate about cloud computing and how it is measured:

- Cloud services pricing & costing
- Cloud computing financing strategies
- Return On Investment (ROI),
- Core Point Indicators (KPIs)
- Complete Holding Expense (TCO)
- Managing threats
- Processes for evaluating decisions and choices for Cloud services

Discussing Cloud Computing's business environment is not more explored in this White Paper; however, as more goods and services are cloud-enabled, it is a necessary field of study moving forward (**Open group, 2020**).

4. ECONOMIC BENEFITS:

Economic benefits are among the critical factors for companies to move data recovery from conventional IT infrastructure to cloud services. Economically, the most significant advantage to cloud computing being that users can have what they use, only compensate only what they need. It is not uncommon for many companies to bear ongoing growing IT maintenance costs (**Makhlouf, 2020**). Creating your own and self-developed IT infrastructure is an expensive and time-consuming task, thereby reducing organisations' operating capacity. In typical situations where there is a need to have any type of IT solution, the overall expense consists of three major factors: the loss of IT infrastructure (servers, storage), the cost of the software (licences) and all manner of the expenses of installation, servicing and repair (for both hardware and software) (**Makhlouf, 2020**).

In a single business, these purchasing powers bring a significant financial outflow over a relatively limited period, which ensures that sufficient financial capital has to be collected beforehand. Therefore, in the sense of the unit's economic sustainability, such a commitment can have a detrimental impact. The cloud infrastructure software framework allows these issues to be eliminated (**Eivy and Weinman, 2017**). Use cloud model IT services is defined as Operating Expenditures (OpEx). Also, the network investments are capital outlays (CapEx). Converting CapEx to OpEx rising the cloud computing model will offer two significant economic benefits:

- Lack of upfront capital expansion allows capital to be redirected to core corporate investment. Expenditure on fixed assets decreases tax base only through depreciation, which may be deducted by several accounting periods acting additional burden of future budgets, depending on the assumed rate of discount. Expenditure on external IT services, in turn, is the cost of the company's current activities and is fully taken into account when determining financial statements. This method of obtaining money may be used for specific investment firms eliminated (**Eivy and Weinman, 2017**).

- The reduction of CapEx spent ensures that the gross balance sheet will not increase and that the return on assets (ROA) does not decline. This ratio is frequently used in economic and financial analyses, so the management of companies may depend on its high value eliminated (Eivy and Weinman, 2017).

5. TOTAL COST OF OWNERSHIP APPROACH

Total ownership expense (TCO) is a statistical calculation aimed at helping customers and market executives assess a company or system's direct and indirect costs. This represents the cumulative expense of purchasing, building, running, sustaining, and ultimately disposing of the company's properties for a given period. Average Cost of Ownership in the IT sector is used to measure existing and planned IT services and telecommunications costs. The template takes into account the direct charges reported in the budget and payroll, as well as the indirect costs-defined as the costs linked to the applications and timeouts of the act.

The most critical part of the layout is-including the expense of the classification scheme that provides a vast set of the groups-the foundation for comparative data on processing costs across a variety of industries.

The formula for measuring TCO includes the following groups and components:

1. Evaluation and Choice:

- Assessment & review of approaches
- Vendor evaluation and (as applicable) SLA analysis;

2. IT Software, applications, and service services

- Database and equipment management and maintenance;
- An operating system, database, protection, backup, and support tools.
- Management Computer structures and network expenses

3. Application subscription costs OR licence fee

- The accessor licencing rate of ERM and CRM applications
- Application maintenance

4. Deployment prices for device solution

- Comprehensive interior architecture
- Setup and Delivery

5. Costs of initial and continuing training

- Learning for Consumers
- Professional skills

6. CASE STUDY COMPARISON WITH THE PROPOSED TCO MODEL AND DISCUSSION

To address the implementation of the TCO model that deals with the provision of a public SaaS cloud computing service. The beneficiary of cloud infrastructure in this research case study is an apparel retailer with 12 stores located around New Zealand. Initially, they operated their cloud system internally to supply all their stores with the distribution portal and point-of-sale that involved a private network, causing difficulties holding the 12 stores that I sync. The company agreed to shift their product to cloud system and transfer points of sale entirely via a service provider to an automated framework repository, thereby achieving cost reduction and no need to maintain the network for retail business owners (Walterbusch, Martens and Teuteberg 2013).

Until the cloud services business launched the IT spending was \$30 K a year (excluding hardware) that covered:

- Management of their host market network servers
- IT assistance of the point of sale shop
- IT assistance for the technology and network of the headquarters
- Remote backup Services.

The company agreed to conduct a variety of market operations utilising cloud infrastructure. Google Apps used to monitor e-mail, diary and contacts apps. Dropbox has provided the circulation and sharing of documents 860. Data

confided to Zero. The software provided by the Vend serves all business infrastructure including back-office, fulfilment centre and development. Benefits gained are impressive from an economic point of view. IT infrastructure requirements are now much simpler to manage. It took just a few weeks to run the whole adoption, with limited consulting expanses. The decision to introduce a new IT management framework is a strategic step for the organisation, and it is essential to consider the investment risk into consideration. Given the apparent benefits of cloud storage, the current version should be contrasted with the standard. These investments are selected based on measuring economic performance. The relative cost-effectiveness of projects such as Return on Investment (ROI), Payback Period (PP), and Net Present Value (NPV) are quantified in many indicators.

Any investment decision should precede reliable calculation and correct interpretation of the results. The TCO calculations take into account a combination of factors (which are wrongly omitted), such as the cost of acquiring and maintaining adequate human competence in the field of IT and the cost of security frameworks introduced and worked. Disregarding all the cost determinants and lack of risk mitigation will contribute to skewed outcomes and inevitably to a sub-optimal approach being selected. Remember that the blueprint for cloud storage isn't necessarily the most efficient approach. Every situation needs to be handled differently. Effective adoption of this paradigm relies on a variety of considerations, such as organisation scale and ability to adopt a whole new form of management. The big concern is rising operating risk, too. Deciding on the cloud business model is, in no small extent moving from internal management of one's own IT infrastructure to external company management. This is important to guarantee the efficiency and safety of facilities that are offered. Migrating IS / IT system to cloud model requires specific contract terms with provider. Contract terms should be de-described in the Service Level Agreements (SLA), as customers give up some control in the cloud computing model vendor.

Analysis and Discussion: As discussed above the data recovery on cloud computing idea of IT implementation has numerous benefits. The TCO model would help the SME's get a bigger picture and a rough estimate for the investment. Migration of IT resources, and data backup on to cloud computing means increased economic efficiency of, but also relinquishing part of control outside vendors. Less control over resources is usually more significant economic benefits and vice versa.

It is, therefore, essential to make a proper balance between the two criteria. The migration and data backup on to cloud computing of IT resources should be widely investigated and based on risk analysis. Therefore the introduction of cloud infrastructure systems eliminates the chance of reducing future sales and consumer withdrawals. Consequently, versatility in adapting to consumer demands may be a strategic advantage.

7. BUSINESS AGILITY

Business resilience is a company's capacity to quickly and cost-efficiently respond to shifts in the operating climate. Agility is a philosophy combining the concepts of stability, balance, adaptability and teamwork. By using the proposed methodology, SME's may execute complicated programmes in a limited period space, based on the user's appropriate interest. Many businesses today focus on cost controls and how cloud-based operating expenses can be reduced. Today, though, most forward-thinking organisations are demonstrating that business agility is the most significant cloud advantage. Business resilience is one of the critical causes businesses tend to seek private clouds. (Nogueira, 2018) Cloud information storage method allows users to share and scale IT resources across workloads and user groups, thereby improving performance and availability of data. Cloud storage reduces the IT running costs and increases market efficiency by allowing a self-service centred programme. Auto-service cloud storage is mostly the product of provisioning, scheduling and task versatility management.

CONCLUSION

As explained all through paper IS / IT integration cloud computing idea has significant advantages. The development provides a feasible option for current conventional IT wealth management scheme. It seems like any organisation will perform a detailed review of the "advantages and disadvantages" of such a strategy before choosing to shift the organisational structure of resources from conventional to cloud computing. Migration of IT services to cloud storage implies improved economic performance, but also the relinquishment of traditional vendors' influence. More capital management is typical to more significant financial advantage, and vice versa. Hence, finding the proper balance between the two parameters is necessary. The transfer of IT resources into cloud-based technologies should be explored thoroughly and focused on risk analysis.

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