



A Study on Impact of Cloud Technology in Business

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Abstract— Organizations are started shifting their major business functions onto cloud platforms. Cloud computing technology has become a popular idea and service to outwit their competition. Cloud technology does not need to be created by the company that uses the cloud; rather it is provided by a cloud company infrastructure. Cloud computing is essentially making a buzz for providing virtually unlimited remote storage of files and software. It is the best alternative method of buying and installing applications. Cloud enables emerging markets to develop and introduce innovative services. In the cloud era, government institutions are provided with the vehicle to efficiently deliver social services such as healthcare and education, as well as to enhance financial services. In this business scenario, enterprises are hounded by the challenge to keep up with the demands of the global economy and survive the competition. The benefits of cloud computing is also glaring in international business marketing. Businesses and people are making use of cloud whenever they boost international business marketing efforts through communicating with partners and clients around the world through web-based email and communication platforms. Apple, Amazon, Google, IBM, Microsoft, IBM and Oracle are gaining top-of-mind awareness in these markets by providing cloud computing services. This technology does not require you to install software in your computer or own a big server. A cloud computing company that sells accounting services provides remote servers and the applications. They provide you online access for managing and maintaining your financial records with minimum payment. Cloud accounting requires an Internet connection and subscription to a virtual accounting service. As more and more companies shift to cloud computing to save money and to increase business value, the future of cloud computing becomes more uncertain. This article describes the cloud services, its positive and negative aspects and business adoptions.

Keywords— Cloud computing, cloud services, cloud service providers.

I. INTRODUCTION

Cloud Computing is a rapidly accelerating revolution within IT and will become the default method of IT industry. Cloud Computing is a term that doesn't describe a single thing – rather it is a general term that sits over a variety of services from Infrastructure as a Service at the base, through Platform as a Service as a development tool and through to Software as a Service replacing on-premise applications [6,12]. It has been defined as the new state of the art technique that is capable of providing a flexible IT infrastructure, such that users need not own the infrastructure supporting these services. It is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction [10]. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models. The essential characteristics are on-demand self-service broad network access, resource pooling, rapid elasticity, measured service [2]. This article discusses about the advantages, types of cloud computing services, different service providers and its business adoptions.

II. ADVANTAGES OF CLOUD COMPUTING

The main advantages of using cloud computing are: i) reduced hardware and maintenance cost, ii) accessibility around the globe, and iii) flexibility and the highly automated process wherein the customer need not worry about software up-gradation which tends to be a daily problem. This integrates features supporting high scalability and multi-tenancy. Moreover, cloud computing minimizes the capital expenditure. This approach is device and user-location independent [3,11]. The other advantages are:

Convenience: You can access your data anywhere you can connect to the Internet.

Security: Most companies use industrial level security software and practices which make it harder for hackers to get at your data. That's harder, but not impossible.

Backups: You have a backup of your data in case your local computer crashes.

Collaboration: With your permission, others can access, view, and modify your documents.

Environmentally friendly: It takes fewer resources to cloud compute, thus saving energy. Some businesses take it a step further and incorporate cloud computing into their telecommuting strategies.

Cloud computing allows businesses to expand or contract computing power as required and allows 'bursts' of computing power to be utilized on an on-demand basis.

III. TYPES OF CLOUD COMPUTING

Cloud computing is typically classified in two ways [5]:

- A) Location of the cloud computing
- B) Type of services offered

A) *Location of the cloud*

Based on location, Cloud computing is classified in the following four ways:

Public cloud: In Public cloud the computing infrastructure is hosted by the cloud vendor at the vendor premises. The customer has no visibility and control over where the computing infrastructure is hosted. The computing infrastructure is shared between multiple enterprises.

Private Cloud: Cloud infrastructure, made available only to a specific customer and managed either by the organization itself or third party service provider [3]. Private clouds are more expensive and more secure when compared to public clouds. Private clouds are of two types: On-premise private clouds and externally hosted private clouds. Externally hosted private clouds are also exclusively used by one organization, but are hosted by a third party specializing in cloud infrastructure. Externally hosted private clouds are cheaper than On-premise private clouds.

Hybrid cloud: Organizations may host critical applications on private clouds and applications with relatively less security concerns on the public cloud. The usage of both private and public clouds together is called hybrid cloud. Hybrid cloud combines multiple clouds (private, community of public) where those clouds retain their unique identities, but they bound together as a unit. It may offer standardized or proprietary access to data and applications as well as application portability.

Community cloud: It involves sharing of computing infrastructure in between organizations of the same community. For example all Government organizations within the state may share computing infrastructure on the cloud to manage data related to citizens residing in that state. It may be managed by the organizations or a third party and may exist on premise or off premise. Community cloud is one where the cloud has been organized to serve a common function or purpose.

B) *Types of service provided*

The application is provided to the client through a thin client interface(usually a browser) and the customers responsibility begins and ends with entering and managing its data and user interaction. Everything from the application down to the infrastructure is the vendor's responsibility [5, 9, 15].

Whether private or public, cloud computing networks have the following three core components:

Infrastructure as a Service (IaaS) - Traditionally in the business environment a user's day-to-day computing resources are held in one server at one location. The infrastructure is fixed. With cloud computing, the infrastructure is provided to the user in an 'on-demand manner'. Leading vendors that provide Infrastructure as a service are Amazon EC2, Amazon S3, Rackspace Cloud Servers, FlexiScale, Linode, Terremark and Flexiscale. IAAS provides virtual machines, virtual storage, virtual infrastructure and other hardware assets as resources that clients can provision. IaaS provider manages the entire infrastructure, but the client has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (e.g., host firewalls).

Platform as a Service (PaaS) - This component really builds on the previous one but with an additional layer of capability that allows organizations to develop, build, and deploy their own applications to support their own specific business needs. Typical players in PaaS are Google's Application Engine, Microsofts Azure, GoGrid CloudCenter, Salesforce.com, force.com. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations.

Software as a Service – Software as a Service (**SaaS**) is where a user no longer owns the software that is utilized but instead uses it when required via cloud computing. The software remains the property of the service provider and the user pays for access either by annual subscription or on a pay-per-usage basis. In this way business applications are no longer a capital expenditure item but instead are an operational expenditure cost. SaaS service providers are GoogleApps, Oracle On Demand, Salesforce.com, SQL Azure.

While IaaS and PaaS will have some value to businesses large enough to have their own computer installations, it is SaaS, with its access to applications, which provides most value to small businesses. Generally IaaS can be obtained as public or private infrastructure or a combination of the two. "Public Cloud" is considered infrastructure that consists of shared resources, deployed on a self-service basis over the Internet. By contrast, "Private Cloud" is infrastructure that emulates some of Cloud Computing features, like virtualization, but does so on a private network. Additionally, some hosting providers are beginning to offer a combination of traditional dedicated hosting alongside Public and/or Private Cloud networks. This combination approach is generally called "Hybrid Cloud."

IV. BENEFITS OF CLOUD COMPUTING

"Business executives are starting to fully appreciate the potential transformative value that cloud can bring to the enterprise." - **Rick Wright**, Global Cloud Enablement Leader, KPMG.

One of the benefits of cloud computing is increased efficiency; services are rapidly deployed and ready for use in a matter of minutes versus the weeks or months it traditionally takes. But there is more to cloud computing than just getting your resources, storage capacity or application as a service within minutes. Cloud-based services can help small

businesses dramatically reduce their software and other computing costs [3, 4]. Storing files on a secure, reliable, cloud-based service helps eliminate backup worries and gives you anytime access to your files. Usually, cloud-based services are simple to use—the only things you need are a computer (or in some cases, a mobile handset), a browser, and an Internet connection. And such services require no maintenance from the user. Easier collaboration with colleagues in distant locations is another cloud benefit. “If you're the kind of small business that has employees who work from different places--or has remote employees, board members, or vendors who need access to your data--cloud computing is the only way to go,” says Rosenfeld of Fanminder.

These benefits enable small businesses to “stay focused, be more collaborative, and bring products to market more quickly, because they've got access to the kind of infrastructure that only large companies used to have,” says Judith Hurwitz, president and CEO of Hurwitz & Associates and a coauthor of *Cloud Computing for Dummies*. It's not difficult to find instances of security breaches in cloud computing, of course. On the other hand, you can't entirely eliminate risk from any computing environment. Intruders may hack into files stored on your business's own servers or hard drives. Hard drives may fail. Unencrypted information stored on laptops may lead to identity theft or lawsuits when the laptops go missing [6].

V. CLOUD COMPUTING AND ITS BUSINESS VALUE

Cloud technology does not need to be created by the company that uses the cloud; rather it is provided by a cloud company infrastructure. For example, every company in Benchmarks portfolio uses Amazons cloud infrastructure in one way or another. When it comes to competition, of course, each business wants to be better than the next. Its goal is to increase their profits with minimal output. To do this, many turn to cloud computing, but the use of cloud computing is not just spreading between different businesses; it is also about who provides the best service to its customers. Cloud computing has a number of different providers that a business could choose from [7].

Businesses can avoid the significant upfront costs of purchasing and installing software applications and hardware systems. This avoids the risk of installing expensive systems, only to discover that they are insufficient for the company's needs. Business operations are more flexible when utilizing cloud computing. Companies can outsource routine information technology operations, such as data storage and backup, and focus on core operations, such as design and development. Cloud computing allows employees to log in from their homes and interact in real time with colleagues working in remote sites several time zones away. Cloud computing does have some challenges. Relying on the cloud for critical storage and other IT needs could leave companies vulnerable in the event of a major network outage. Email service outages, for example, may leave thousands of customers without an important communication tool. Privacy is a concern, because criminal elements could get access to personal data. Companies also may be reluctant to use cloud computing due to security concerns, such as computer hacking, information theft and unauthorized access to sensitive data [8]. Cloud-based storage allows you to store files online. Some cloud-based storage companies provide storage space for backing up content on a single computer and restoring it to the same computer in the event of a hardware failure, while others provide space for you to store selected files and access them from any computer [1]. Cloud accounting requires an Internet connection and subscription to a virtual accounting service. Cloud computing refers to transactions performed over the Internet. The practice does not require you to install software in your computer or own a server. A cloud computing company that sells accounting services provides remote servers and the applications. For a fee, they grant you online access to them for managing and maintaining your financial records [9].

With cloud computing, emerging economies are provided with the opportunity to embrace next-generation tools, applications and infrastructure. A recent study conducted by leading world market research organization reveals that turning to cloud services is topping business and software strategies in emerging markets.

A. Cloud Computing Service Providers

Service providers offer cloud computing services to their clients within very cost effective packages and still maintain the quality of services at their best. Cloud computing is the best way to save money, have faster, efficient and trouble free web hosting services through internet from across the globe. Some of the providers are [13]:

Adhost is a leading provider of Web hosting and collocation services in the Northwest. **Applied Innovations** is a Boca Raton, FL based web presence provider (web host) that specializes in hosting on the Windows Server platform. **BlueFire** is totally focused and experienced in managed desktop services and managed application hosting. Effectively combining processing power and security, **Bull designs**, implements and runs internationally renowned solutions for public and private sector organizations alike, that transform information systems into positive drivers for excellence, differentiation and value-creation [11].

Cloudmore is a market leading provider of cloud services, headquartered in Stockholm. Founded in 2008, **Consuro** is an information technologies Managed Service Provider (MSP) who provides comprehensive Windows-based desktop and server management, network administration, computer hardware and software consulting, offsite backup, asset procurement, and other advanced data center solutions. **Crystone** is today one of Scandinavia's leading service providers in webhotel and hosting, with roots and headquarters in Stockholm. **Fpweb.net** is a dedicated Cloud provider with a sole focus on Microsoft SharePoint. **GPK** provides certified technical expertise in implementing the latest technology and/or upgrading of existing network infrastructure to enhance performance and productivity. **ICO** has built an enviable reputation providing leading edge technologies in IaaS and virtualized environments. **OBT** is a premium hosted services provider that delivers state-of-the-art technology platform & business technology strategy consultation to your businesses around the world.

OneNet is a pioneer and New Zealand market leader in cloud computing. OneNet specialises in delivering software applications to its clients and securely storing their business data in the cloud. For over two decades, **PC Net** has been delivering intelligent technology services to clients in many different business categories. **Oriensoft Technologies Private Limited** located in Mumbai is a leading Managed Hosting Services and Solutions Provider providing premium-hosting services for all types of businesses since 1999. It provides customized, high-end, and managed hosting services and solutions to companies with a critical internet component. It's hosting Infrastructure and Architecture provides a flexible, scalable, secure, reliable, and high availability hosting solution to satisfy a wide range of online businesses.

Netmagic Solutions with its online provisioning and management elastic computing is among the few cloud computing service providers in India. They have the expertise, robustness of cloud infrastructures, managed services support and ability to offer the entire IT infrastructure in the cloud. Gartner predicts that cloud computing will surge to 150 billion dollars by 2013. Below is a partial list of companies that provide cloud computing services: Amazon, Google, Microsoft, Salesforce.com, Citrix, IBM, Mozyhome, Sun Open Cloud Platform, cohesiveFT, Icloud, Nivanix, VMware, Flexscale, Joyent, Rackspace, 3tera.

B. Examples of Cloud Computing Services for Business

The most popular services for small businesses are [1, 9]:

- **Google Apps** (\$50 per user per year) and **Google Docs** (free) are offerings from the Google cloud empire. Google Apps is a business-class version of Google Docs and includes souped-up Gmail, Google Calendar, and Google Docs (for word processing, spreadsheet, presentations and forms) components along with administration capabilities.
- **Box.net** (free for 1GB of storage; \$10 for an individual plan; \$15 monthly for three or more users) is an online workspace service for file sharing and collaboration.
- **Skype** is popular for its free video chats as well as for the low-cost calls to landline and cell phones that it makes possible.
- **Highrise** for CRM and **Basecamp** for project management (\$24 to \$149 per month each, depending on the level of service you choose) both come from 37signals. Cloud applications are cheaper, simpler and faster to function that saves plenty of time and money. Companies fighting with bad economical growth have a sure short reason to adapt cloud computing, as it is very economic. Ongoing operational expenses are not required to run datacenter, so you spend less and save more. Huge capital is not necessary for setting up storage facility and buying servers at data center. Flexibility to access the data from anywhere in the world with a compatible device & steady internet connectivity makes cloud computing the hot favorite among all web hosting services available at present. You need to make sure that the service provider offer cloud computing services along with round the clock customer support, which will help you in future in case you face any problem to access the cloud services. As these cloud computing services are flexible, to be used from across any place in the world over the internet, 24X7 support is essential to access the services without any trouble.

C. Challenges to be overcome

With any new technology it is important to consider the additional risks that it may bring as well as the benefits. The risks are [3]:

Security – Whether organizational data sits in a cloud or in a traditional perimetered system, data will still be vulnerable to hacking and other intrusive attacks.

Internet resilience and bandwidth – The public cloud is delivered via the Internet's network and therefore is vulnerable should this become unavailable.

Compliance – Many countries' data protection laws restrict the way in which data can be stored and mandate the way in which it must be protected. Cloud computing usage, especially where it utilizes the public cloud, may place the organization in non-compliance with data protection laws. It is, therefore, important that this is considered both prior to and during cloud computing implementation.

D. Tips to move into the Cloud

Once you've weighed the pros and cons, you may be ready to take your first steps into cloud computing. Before you do, consider these tips from small businesses that have already made the transition [8].

- **Start small.** Cloud computing is a different way of working from what most people are used to, and building familiarity and trust takes time, says Trevor Doerksen, CEO and founder of MoboVivo, a 12-member video content portal/software company. Doerksen recommends starting small--for example, by having two or more workers collaborate on a Google Docs file. Once team members grow more comfortable with the new work environment, you can start adding more cloud services to the mix.
- **Think big.** Can the service you're considering scale to meet your needs as your business grows? If not, keep looking.
- **Make sure you can export your data in standard formats.** You'll want to be able to export in the formats used by Word, Excel, and other programs you use. That way, you can back up (and access) your data locally or move it easily to another service later.
- **Read the agreement closely.** To use the service, you'll most likely have to accept an endless service-level agreement or other contract at the outset. Read it carefully to ensure that you know what you're paying for, what the service provider's privacy policy is, whether there are fees for early termination, and so on.
- **Get creative.** Look for ways to use free or low-cost cloud tools instead of more-expensive ones, suggests Doerksen. For example, his team uses free Google Docs spreadsheets as a basic CRM system, rather than springing for a paid CRM cloud service.

- **Evaluate more than one service before deciding.** Most services offer a free trial, and “you can usually figure out in 10 minutes whether the service’s user interface will drive you mad or is easy to use,” says Rosenfeld.
- **Consider open-source cloud services.** This arrangement encourages third-party developers to build add-ons that make a cloud-based service even more feature-rich. Plus, it allows you to create your own tools for using the service that are unique to your business.
- **Don’t be afraid.** It makes sense to cautiously approach any big change in how you do business, and this certainly applies to moving to the cloud. But many feel that the business world is already making the transition to cloud computing, and--given the lousy economy--now is a good time to make the transition. “I can’t think of any company that shouldn’t try it. If you don’t, you’re missing out on an opportunity to prepare your business for the future”, says Doerksen. For organizations looking to move to Cloud Computing, it is important to understand the different aspects of Cloud Computing and to assess their own situation and decide which types of solutions are appropriate for their unique needs.

VI. CONCLUSION

Cloud computing is disruptive in both a good and bad sense. It is opening the door to applications, tools, and development resources previously unavailable to organizations. It’s making applications and infrastructure more affordable for enterprises and small businesses, and making the implementation of innovative technologies easier and faster. In the eyes of the consumer, it is vastly improving the technology innovation and cost/benefit equation. For the IT industry, cloud computing is an opportunity to transform business models and delivery systems. The cloud is making it easier and more cost effective to deliver applications, platforms, and infrastructure to consumer organizations. It offers real benefits to companies seeking a competitive edge in today’s economy. Many more providers are moving into this area, and the competition is driving prices even lower. The age of cloud is seen to gain wide acceptance across industries in Brazil, China and India, with emphasis on growth of Cloud service implementation in the next two years.

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