Strategic use of erp systems information technology essay

Technology, Information Technology

Cloud computing makes computer infrastructure services available " on-need" basis. The computing infrastructure could include hard disk, development platform, database, computing power or complete software applications. To access these resources from the cloud vendors, organizations do not need to make any large scale capital expenditures. The cloud computing " revolution" is being driven by companies like Amazon, Google, Salesforce and Yahoo! as well as traditional vendors including Hewlett Packard, IBM, Intel and Microsoft and adopted by individuals through large enterprises including General Electric, L'Oréal, Procter & Gamble and Valeo. For example, Google Apps provides common business applications online that are accessed from a web browser, while the software and data is stored on the servers. In this report we study the development of cloud computing & its significance for the procedure of ERP systems. We discuss that the development of cloud computing could lead to a significant change in the way business software is installed in companies. Our reference structure covers three stages, first is Infrastructure-as-a-service, second is Platform-as-a-service and third is Software-as-a-service. It explains the meaning of public, private and hybrid clouds. The three stages of cloud computing and their effect on ERP systems procedure are discussed.

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INTRODUCTION:

Cloud computing is Internet-based computing, whereby shared resources, software, and information are provided to computers and other devices on demand, like the electricity grid. The term " cloud" is used as a metaphor for the Internet, based on the cloud drawing used in the past to represent the telephone network, and later to depict the Internet in computer network diagrams as an abstraction of the underlying infrastructure it represents. Typical cloud computing providers deliver common business applications online that are accessed from another Web service or software like a Web browser, while the software and data are stored on servers. A key element of cloud computing is customization and the creation of a user-defined experience. PIC-1

Fig. 1 Cloud computing for conceptual diagram

Most cloud computing infrastructures consist of services delivered through common centers and built on servers. Clouds often appear as single points of access for all consumers' computing needs. Cloud computing is unlike grid computing, utility computing, or autonomic computing. In fact, it is a very independent platform in terms of computing. The best example of cloud computing is Google Apps where any application can be accessed using a browser and it can be deployed on thousands of computer through the

Internet. The major cloud service providers include Microsoft, Salesforce, Amazon, and Google.

LITERATURE REVIEW:

Cloud computing can be defined as " a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models." [1]. Cloud computing is a new term in information technology and like other Information technology terms it has also a history. Many people argue that it is not a new term. Now, let see some statements given by some people. According to Colaner 2010 [2], " it is not new, the metaphor may be but the underlying technologies have been well-established for a long time", Technologies such as the Gridsystems, internet, any IT outsourcing -- network infrastructure, security monitoring, remote hosting are all forms of cloud computing. According to Schneier 2009 [3], " it is a modernversion of the timesharing model from the 1960s when computers were expensive and hard tomaintain which was eventually killed by the rise of the personal computer. History of cloud computing is the evolution from super computer to cluster computing where computers were brought together which form a single large computer which creates a sense of super computer. [4]. Grid computing come after the cluster computing in 1990’s and it was considered as the future of computing because it was cost effective, it could solve problems with

computing power. According to Leyden 2009 [5], " Cloud Computing found its origin in the success of server virtualization and the possibilities to run IT more efficiently through server consolidation." After grid computing, utility computing come. It is the consumption of computing services as a utility. Here, charges are placed on actual consumption and not on flat rate. This whole concept was developed to make cloud computing.

Fig. 2 Evolution of Cloud Computing

MEANING OF CLOUD COMPUTING:

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e. g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics.

Essential Characteristics:

On-demand self-service. A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service’s provider. Broad network access. Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e. g., mobile phones, laptops, and PDAs). Resource pooling. The provider’s computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned

according to consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e. g., country, state, or datacenter). Examples of resources include storage, processing, memory, network bandwidth, and virtual machines. Rapid elasticity. Capabilities can be rapidly and elastically provisioned, in some cases automatically, to quickly scale out and rapidly released to quickly scale in. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at any time. Measured Service. Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e. g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported providing transparency for both the provider and consumer of the utilized service.

NEED OF CLOUD COMPUTING:

Adopting a cloud computing strategy can help businesses conduct their core businessactivities with less hassle and greater efficiency. Companies can maximise the use oftheir existing hardware to plan for and serve specific peaks in usage. Thousands of virtualmachines and applications can be managed more easily using a cloud-like environment. Businesses can also save on power costs as they reduce the number of servers required. And with IT staff spending less time managing and monitoring the data centre, IT

teamsare well placed to further streamline their operations as staff complete more work on fewer machines.

FEATURES OF CLOUD COMPUTING:

Agility improves with users' ability to rapidly and inexpensively re-provision technological infrastructure resources. Cost is claimed to be greatly reduced and capital expenditure is converted to operational expenditure. This ostensibly lowers barriers to entry, as infrastructure is typically provided by a third-party and does not need to be purchased for one-time or infrequent intensive computing tasks. Pricing on a utility computing basis is fine-grained with usage-based options and fewer IT skills are required for implementation (in-house). Device and location independence enable users to access systems using a web browser regardless of their location or what device they are using (e. g., PC, mobile). As infrastructure is off-site (typically provided by a third-party) and accessed via the Internet, users can connect from anywhere. Centralization of infrastructure in locations with lower costs (such as real estate, electricity, etc.)Reliability is improved if multiple redundant sites are used, which makes well designed cloud computing suitable for business continuity and disaster recovery. Scalability via dynamic (" on-demand") provisioning of resources on a fine-grained, self-service basis near real-time, without users having to engineer for peak loads. Performanceis monitored, and consistent and loosely coupled architectures are constructed using web services as the system interface. One of the most important new methods for overcomingperformance bottlenecks for a large class of applications is data parallel programming on a distributed data grid. Security

could improve due to centralization of data, increased security-focused resources, etc., but concerns can persist about loss of control over certain sensitive data, and the lack of security for stored kernels. Security is often as good as or better than under traditional systems, in part because providers are able to devote resources to solving security issues that many customers cannot afford. Providers typically log accesses, but accessing the audit logs themselves can be difficult or impossible. Furthermore, the complexity of security is greatly increased when data is distributed over a wider area and / or number of devices. Maintenance cloud computing applications are easier to maintain, since they don't have to be installed on each user's computer. They are easier to support and to improve since the changes reach the clients instantly. Metering cloud computing resources usage should be measurable and should be metered per client and application on daily, weekly, monthly, and annual basis. This will enable clients on choosing the vendor cloud on cost and reliability (QoS).

ARCHITECTURE OF CLOUD COMPUTING:

Cloud architecture, the systems architecture of the software systems involved in the delivery of cloud computing, typically involves multiple " cloud components‟ communicating with each other over application programming interfaces, usually web services. This resembles the Unix philosophy of having multiple programs each doing one thing well and working together over universal interfaces. Complexity is controlled and the resulting systems are more manageable than their monolithic counterparts. The two most significant components of cloud computing architecture are

the front end and the back end. The front end is the part seen by the client, i. e. the computer user. This includes the client‟s network (or computer) and the applications used to access the cloud via a user interface such as a web browser. The back end of the cloud computing architecture is the " cloud‟ itself, comprising various computers, servers and data storage devices. pic-2

Fig. 3 Cloud computing sample architecture

Cloud has centralized server administration system. Centralized server administers the system, balances client supply, adjusts demands, monitors traffic and avoids congestion. This server follows protocols, commonly known as middleware. Middleware controls the communication of cloud network among them. Cloud Architecture runs on a very important assumption, which is mostly true. The assumption is that the demand for resources is not always consistent from client to cloud. Because of this reason the servers of cloud are unable to run at their full capacity. To avoid this scenario, server virtualization technique is applied. In sever virtualization, all physical servers are virtualized and they run multiple servers with either same or different application. As one physical server acts as multiple physical servers, it reduces the need for more physical machines. As a matter of fact, data is the most important part of cloud computing; thus, data security is the top most priority in all the data operations of cloud. Here, all the data are backed up at multiple locations. This astoundingly increases the data storage to multiple times in cloud compared with a regular system. Redundancy of data is crucial, which is a must-have attribute of cloud computing.

LAYERS OF CLOUD COMPUTING:

Client

A cloud client consists of computer hardware and/or computer software that relies on cloud computing for application delivery, or that is specifically designed for delivery of cloud services and that, in either case, is essentially useless without it. Examples include some computers, phones and other devices, operating systems and browsers.

Application

Cloud application services deliver software as a service over the Internet, eliminating the need to install and run the application on the customer's own computers and simplifying maintenance and support. People tend to use the terms " Software as a Service (SaaS)" and „ cloud‟ interchangeably, when in fact they are 2 different things. Key characteristics include: Network-based access to, and management of, commercially available (i. e., not custom) softwareActivities that are managed from central locations rather than at each customer's site, enabling customers to access applications remotely via the WebApplication delivery that typically is closer to a one-to-many model (single instance, multi-tenant architecture) than to a one-to-one model, including architecture, pricing, partnering, and management characteristics Centralized feature updating, which obviates the need for downloadable patches and upgrades. pic-3

Fig. 4: Layers

Platform

Cloud platform services or " Platform as a Service (PaaS)" deliver a computing platform and/or solution stack as a service, often consuming " cloud infrastructure‟ and sustaining " cloud applications‟. It facilitates deployment of applications without the cost and complexity of buying and managing the underlying hardware and software layers.

Infrastructure

Cloud infrastructure services, also known as " Infrastructure as a Service (IaaS)", deliver computer infrastructure - typically a platform virtualization environment - as a service. Rather than purchasing servers, software, data-center space or network equipment, clients instead buy those resources as a fully outsourced service. Suppliers typically bill such services on a utility computing basis and amount of resources consumed (and therefore the cost) will typically reflect the level of activity. IaaS evolved from virtual private server offerings.

Server

The server’s layer consists of computer hardware and/or computer software products that are specifically designed for the delivery of cloud services, including multi-Updates - 2010 Cloud Computing 9 core processors, cloud-specific operating systems and combined offerings.

DEPLOYMENT MODELS:

Public cloud

Public cloud or external cloud describes cloud computing in the traditional mainstream sense, whereby resources are dynamically provisioned on a fine-grained, self-service basis over the Internet, via web applications/web services, from an off-site third-party provider who bills on a fine-grained utility computing basis. pic-4

Fig. 5: Cloud Computing Types

Hybrid cloud

A hybrid cloud environment consisting of multiple internal and/or external providers " will be typical for most enterprises". By integrating multiple cloud services users may be able to ease the transition to public cloud services while avoiding issues. Another perspective on deploying a web application in the cloud is using Hybrid Web Hosting, where the hosting infrastructure is a mix between Cloud Hosting for the web server, and Managed dedicated server for the database server.

Private cloud

Private clouds are basically hosted for a single client. They offer better security, quality of service and utmost control over the data. Every organization will have its own infrastructure and the way in which applications are organized. Enterprise’s datacenter or a collocation facility can be used to deploy the private clouds.