Topic: **Entrepreneurship and Business Innovation**

In Cloud Computing

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Abstract: Today is the era of Cloud Computing Technology in IT Industries. Cloud computing which is based on Internet has the most powerful architecture of computation. It reckons in of a compilation of integrated and networked hardware, software and internet infrastructure. It has various avails atop grid computing and other computing. Cloud Computing has come of age later Amazons introduce the first of its kind of cloud services in2006. It is particularly suitable to Hong Kong because of the unbelievable amounts of the data that are being processed here daily in several sectors, and there are signs that subscription to cloud services by the local companies will soon be on a skyrocket course, despite a slow start in beginning years. As a research theme, cloud computing now easily tops any schedule of topics in a computer science because of its far-reaching suggestion in many sector in computing, especially a big data which without cloud computing is at the great concept. Cloud computing, the life time dream of computing as a utility, has the capacity to convert a huge part of the IT industry, making software even more attractive as a service and shaping the way IT hardware is designed and purchased. The primary goal of this research is to create a cloud computing service provider business model that is built on circular economy principles and can guarantee the sustainable usage of cloud computing resources.

Key words: Cloud, SaaS, PaaS, IaaS, Cloud Computing.

Introduction:

Joseph Carl Robnett Licklider in the 1960s developed Cloud Computing with his work on ARPSNET to interact with people and data from in any place at any time. In 1983, CompuServe presented its users as a little amount of disk space that could be used to accumulate any files they choose to upload. Like real clouds which are the collection of water molecules, the term _cloud'in cloud computing is the collection of networks. The user can use the modalities of cloud computing boundlessly whenever demanded. Instead of setting up their own physical infrastructure, the users ordinarily prefer a mediator provider for the service of the internet in cloud computing. The users have to pay only for the services they had used. The workload can be shifted to reduce the workload in cloud computing. A load of service is handled by the networks which forms the cloud that's why the load on local computers is not heavy while running an application. So the requisition of hardware and software at the user side is decreased. All we need to have a web browser to use cloud computing.

The basic examples of cloud computing which are used by general people in daily life are Facebook, YouTube, Drop box, and Gmail etc. It offers scalability, flexibility, agility, and simplicity that's why its use is rapidly increasing in the enterprises.

Definition:

There are various definitions of what exactly is cloud computing depending on different experiences, points of view and how someone can perceive the Cloud. Forrester Inc. has proposed its definition about cloud computing: "A standardized IT capability, such as software, app platform, or infrastructure, delivered via Internet technologies in a pay-per-use and self-service way". The National Institute of Standards and Technology (NIST) defined a more comprehensive term: "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction".

Objective:

Regardless of the type, the goal of cloud computing is to provide easy, scalable access to computing resources and IT services.

Cloud infrastructure involves the hardware and software components required for the proper deployment of a cloud computing model. Cloud computing can also be thought of as utility computing or on-demand computing.

The objectives of the research are to analyse secondary and primary data and come up with valuable findings and conclusions about the potential benefits of cloud computing on Greek entrepreneurship and startup companies. An objective of the research is to understand and discuss how this new technological paradigms can enable entrepreneurial activities in a transitioning economy. This dissertation can be also used as a guide for

individuals or start-up companies who have the intention to use cloud technologies and who want to get deeper knowledge on the term "cloud computing".

International Case Studies

Cloud computing services can be easily used in one's daily life but also in business life. Indeed, it is likely that we are using some cloud services without realizing. SaaS is the model of cloud computing which is the most visible and understandable to the end-users. Services which provide e-mail or storage are using the cloud. Cloud services can make our daily life easier and save time and from a business aspect it can lead to money savings and more efficient operations. One of the most popular use of cloud computing is that of social networking websites such as Facebook, LinkedIn, Twitter etc. But apart from the social value they create, social networking platforms are used by companies in order to interact with customers, promote their products or services but also used for internal communication and collaboration. In addition, e-mail solutions on the cloud offer flexibility and mobility since e-mails can be accessed from any place. Considering how important the e-mail services are, this is the reason why some of the biggest cloud services are web based e-mail. Using Google Docs users are able to edit online documents, share them and work at the same time with other, enhancing collaboration and team work. Finally, storage cloud services such as Dropbox or Simplicity offer an easy way for backing up files and accessing the same files from different devices. There are several major international cloud service providers which have invested in delivering a variety of cloud services and solutions to individuals or companies. These include Amazon, IBM, Google, Oracle, Dell, Cisco, HP, Intel etc. The following cases are an indication of some of the major firms providing cloud services.

Google: Google offers some of the most famous cloud applications such as Google Apps (Gmail, Google Drive, and Google Calendar etc), Picasa and Google Reader which can be accessed through various devices via the Internet in any place and time. These applications belong to the SaaS layer of the cloud and as a result users do not have to install any software or save any data to their personal computers.

Example of Google cloud services used in the area of education Moreover, Google, through Google App Engine, offers the ability to developers to build and run applications on Google's infrastructure. Google App Engine supports various programming languages and offers any easy way to build applications which are easy to maintain and scale according to your demands. Amazon One of the Amazon's web services is the Elastic Compute Cloud service (Amazon EC2), which offers resizable computing capacity in the cloud. Amazon EC2 web service allows customers to quickly scale up and down computing capacity as the demand changes within minutes. The elasticity of this service allows customers to commission as many server instances as they need instantly, but also the application has the ability to automatically scale up or down by itself as the demand changes. Amazon EC2 provides a range of instance types designed for different use cases. These can range

from small and economical instances can be chosen for low volume applications, up to cluster computing instances designed for high performance computing workloads. Developers can also take advantage of virtualization, and as a result they can choose among various operating systems, instance types and software packages. The main features of these services include elasticity, control, flexibility, security and different pricing options including on demand pricing where you pay only what you use with no long-term commitments or upfront fees. 9 Other Amazon services include Amazon S3 service for storage, DynamoDB for databases and Simple Queue Services (SQS).

Microsoft: Microsoft provides services in all three levels of the cloud. It offers public and commercial services using the SaaS model, a platform for building and deploying applications with Windows Azure Paas model and finally it offers infrastructure with Windows Azure Iaas model. To begin with the SaaS model, Microsoft is offering services to end-users and commercial entities. Popular end-users' services include Bing search engine, Hotmail and MSN portal belong to consumers' cloud services. Concerning commercial services, these include applications such as Office 365 suite, Exchange online, Outlook online, Microsoft Dynamics CRM online, collaboration tools etc.


Cloud services provided by Microsoft

Concerning the PaaS model, the most popular services includes Windows Azure for hosting and storage and SQL Azure for services related to databases. Developers can host their applications in Windows Server 2008 environment which means that they can use Windows Azure environment in the same way as they would use it in a typical Windows Server 2008 environment which is on premises. As a result .NET, Java, PHP, Python etc can be supported. Figure 5 Cloud services provided by Microsoft Concerning SQL Azure, Microsoft offers all functions related to databases such as data synchronization with other databases, backups etc.

Apple: Apple's motive to use the cloud was to offer a unique service to users who had its devices. iCloud, which is Apple's most recent cloud storage and cloud computing service, used to store data such as applications

and music and then download them to multiple devices such as IOSbased devices or personal computers. It also used for syncing emails, contacts, calendars, notes etc between IOS devices.

TYPES OF CLOUD COMPUTING
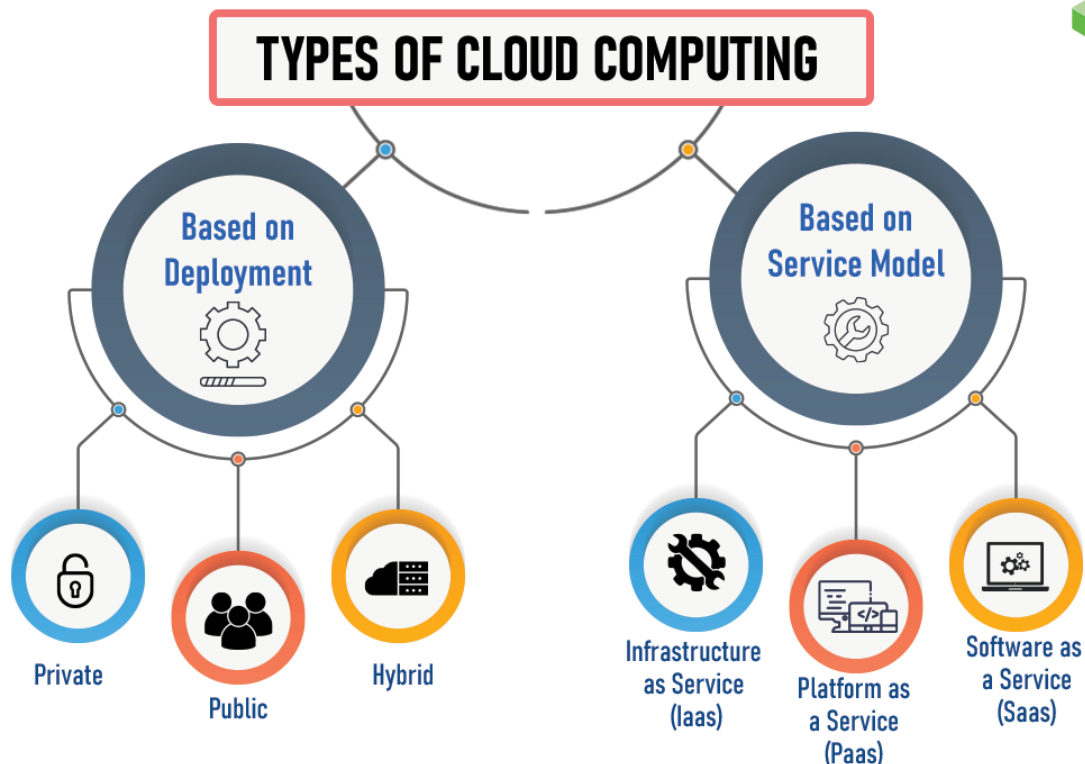
Public Cloud: The public cloud is a computing service supplied by the third party providers atop the public internet. These services are available for any user who wants to use them and they have to pay only for the services they consumed.

Private Cloud: The computing services provided over the internet or private network come under the private cloud and these services are offered only to the selected users in place of common people. A higher security and privacy is delegated by private clouds through the firewall and internal hosting.

Hybrid Cloud: Hybrid cloud is the combination of public cloud and private cloud. In the hybrid cloud, each cloud can be managed independently but data and applications can be shared among the clouds in the hybrid cloud.

Cloud Computing Services

1. **Infrastructure as a service (IaaS).** IaaS providers, such as Amazon Web Services (AWS), supply a virtual server instance and storage, as well as application programming interfaces (APIs) that let users migrate workloads to a virtual machine (VM). Users have an allocated storage capacity and can start, stop, access and configure the VM and storage as desired. IaaS providers offer small, medium, large, extra-large and memory- or compute-optimized instances, in addition to enabling customization of instances for various workload needs. The IaaS cloud model is closest to a remote data centre for business users.

2. **Platform as a service (PaaS).** In the PaaS model, cloud providers host development tools on their infrastructures. Users access these tools over the internet using APIs, web portals or gateway software. PaaS is used for general software development and many PaaS providers host the software after it's developed. Examples of PaaS products include Salesforce Lightning, AWS Elastic Beanstalk and Google App Engine.

3. **Software as a service (SaaS).** SaaS is a distribution model that delivers software applications over the internet; these applications are often called *web services*. Users can access SaaS applications and services from any location using a computer or mobile device that has internet access. In the SaaS model, users gain access to application software and databases. An example of a SaaS application is Microsoft 365 for productivity and email services.

Benefits

- Easy to set up and use immediately.

- Easy to access remotely (e.g. on any internet-connected device like a computer, laptop or mobile phone, easy access for working-from-home models).

- Easy to share access with multiple staff members in the work environment and remotely.

- Easy to share documents and business records with your professional service providers (e.g. accounting, legal).

- Apps for most common business software are available for tablets, mobile phones, and other devices.

- Software versions are updated regularly.

- Many common business tools are compatible with and interact seamlessly with other tools and digital platforms (e.g. transfer of data to the Australian Taxation Office from cloud-based accounting software).

- Does not require expensive networking infrastructure in your business premises (e.g. a network server, backups, and highly skilled staff).

- Can provide storage infrastructure and data back-up.

Advantages:

Back-up and restore data: Once the data is stored in the cloud, it is easier to get back-up and restore that data using the cloud.

Improved collaboration: Cloud applications improve collaboration by allowing groups of people to quickly and easily share information in the cloud via shared storage.

Excellent accessibility: Cloud allows us too quickly and easily access store information anywhere, anytime in the whole world, using an internet connection. An internet cloud infrastructure increases organization productivity and efficiency by ensuring that our data is always accessible.

Low maintenance cost: Cloud computing reduces both hardware and software maintenance costs for organizations.

Mobility: Cloud computing allows us to easily access all cloud data via mobile.

IServices in the pay-per-use model: Cloud computing offers Application Programming Interfaces (APIs) to the users for access services on the cloud and pays the charges as per the usage of service.

Unlimited storage capacity: Cloud offers us a huge amount of storing capacity for storing our important data such as documents, images, audio, video, etc. in one place.

Data security: Data security is one of the biggest advantages of cloud computing. Cloud offers many advanced features related to security and ensures that data is securely stored and handled.

Characteristics of cloud computing

Agility: The cloud **works in a distributed computing environment**. It shares resources among users and works very fast.

High availability and reliability: The availability of servers is high and more reliable because the **chances of infrastructure failure are minimum**.

High Scalability: Cloud offers **"on-demand" provisioning of resources on a large scale**, without having engineers for peak loads.

Multi-Sharing: With the help of cloud computing, **multiple users and applications can work more efficiently** with cost reductions by sharing common infrastructure.

Device and location independence: Cloud computing enables the users to access systems using a web browser regardless of their location or what device they use e.g. PC, mobile phone, etc. **As infrastructure is off-site** (typically provided by a third-party) **and accessed via the Internet, users can connect from anywhere**.

Maintenance: Maintenance of cloud computing applications is easier, since they **do not need to be installed on each user's computer and can be accessed from different places**. So, it reduces the cost also.

Top 10 Trends of Cloud Computing in 2023
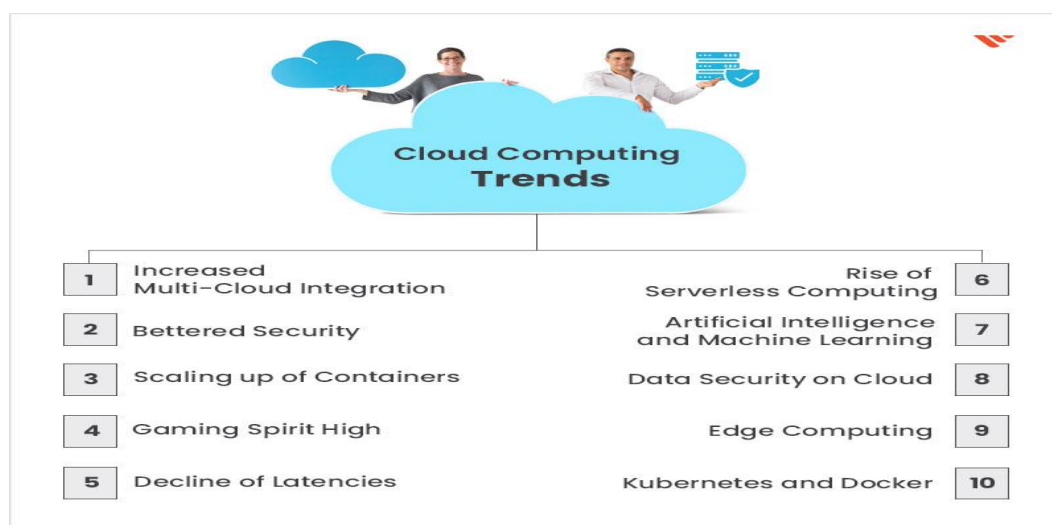
The **top 10 cloud computing trends** of 2024

1. AI and ML
2. Data Security
3. Multi and Hybrid Cloud Deployment
4. Low Code and No Code Cloud Solutions
5. Edge computing
6. IoT
7. Kubernetes and Docker
8. Serverless architecture/computing
9. DevSecOps
10. Disaster recovery and backup

Conclusion:

In this review paper we described in short the introduction, evolution, types and components of cloud computing and also different approaches of cloud computing and some of its and characteristics and advantages. The application area of cloud computing will continuously be increasing. Today approximately all small and big industries are using cloud computing to manage storage, traffic, hardware requirements. So, it is clear that there is major impact of cloud computing on society and business.

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