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Assignment one: T.Y.C.S. Cloud computing

1. List and describe attributes of cloud computing systems.

1. On-demand self-service

Cloud computing resources can be provisioned without human interaction from the service provider. In other words, a manufacturing organization can provision additional computing resources as needed without going through the cloud service provider. This can be a storage space, virtual machine instances, database instances, and so on.

2. Broad network access

Cloud computing resources are available over the network and can be accessed by diverse customer platforms. It other words, cloud services are available over a network—ideally high broadband communication link—such as the internet, or in the case of a private clouds it could be a local area network (LAN).

3. Multi-tenancy and resource pooling

Cloud computing resources are designed to support a multi-tenant model. Multi-tenancy allows multiple customers to share the same applications or the same physical infrastructure while retaining privacy and security over their information.

It's similar to people living in an apartment building, sharing the same building infrastructure but they still have their own apartments and privacy within that infrastructure. That is how cloud multi-tenancy works. Resource pooling means that multiple customers are serviced from the same physical resources. Providers' resource pool should be very large and flexible enough to service multiple client requirements and to provide for economy of scale. When it comes to resource pooling, resource allocation must not impact performances of critical manufacturing applications.

4. Rapid elasticity and scalability

One of the great things about cloud computing is the ability to quickly provision resources in the cloud as manufacturing organizations need them. And then to remove them when they don't need them.

With cloud computing scalability, there is less capital expenditure on the cloud customer side.

Justin-time (JIT) service is the notion of requiring cloud elasticity either to provision more resources in the cloud or less. For example, if a manufacturing organization all of a sudden needs more computing power to perform some kind of complex calculation, this would be cloud elasticity that would be a justin-time service.

In terms of the bottom line, when manufacturing organizations need to test something in the cloud, they are paying for what they use as they use it. As long as they remember to de-provision it, they will no longer be paying for it. There is no capital expense here for computer resources. Manufacturing organizations are using the cloud provider's investment in cloud computing resources instead. This is really useful for testing smart manufacturing solutions.

5. Measured service

Cloud computing resources usage is metered and manufacturing organizations pay accordingly for what they have used. Resource utilization can be optimized by lereraging charge-per-use capabilities. This means that cloud resource usage—whether virtual server instances that are running or storage in the cloud—gets monitored, measured and reported by the cloud service provider. The cost model is based on "pay for what you use"—the payment is variable based on the actual consumption by the manufacturing organization.

2. Discuss key enabling technologies in cloud computing.

- Distributed computing (cluster, Grid Computing)

Distributed computing (or distributed processing) is the technique of linking together multiple computer servers over a network into a cluster, to share data and to coordinate processing power.

- Internet technologies (Service-oriented architecture, Web 3.0, etc.) Internet Technologies is a technical field that covers the necessary skills to derelop applications on the Internet or Internet based systems, harnessing e-commerce, cloud, mobile, and Web based technologies.

- Hardware Technologies (Multi-core chips, Virtualizations, etc.)- Computer hardware technology inrolves working with computer equipment like chips and peripherals, from the design stage to the installation stage. Read more about the job duties, employment and required education for this field.

- System Management technologies (Automatics computing)

Systems management refers to enterprise-wide administration of distributed systems including (and commonly in practice) computer systems. Systems management is strongly influenced by network management initiatives in telecommunications.

3. Discuss different ways for cloud service provider to maximize their Revenue.

1. Say Goodbye to IT Problems

Cloud computing provides the ability to essentially outsource operational IT work to an external company. This shifts the risks and burden associated with having to maintain an IT infrastructure in-house. Your cloud service provider will assume all the risks and most of the burden.

2. Safe and Secure

The reluctance of many companies to more over to the cloud lies in a misapprehension that keeping IT operations under tight control in-house, is a safer solution. However, while moving to the cloud does mean giving up some control, it is often the case that a third party firm will be able look after your data more securely than you could.

3. An Economical Solution

The overarching goal of any business is to make a profit, and cutting operational costs whererer possible can greatly impact that goal. The greatest benefit of moving to the cloud is unsurprisingly a financial one. The financial model associated with the cloud is predictable and economical. There's no upfront costs, flatrate monthly fee per user and/or amount of

4. A More Connected Workforce

A recent survey by Frost & Sullivan showed that companies investing in collaboration technologies increased productivity by as much as 400%. Cloud computing allows for easy collaboration between employees. Workers can access relevant files and documents from wherever they are: prospects headquarters, on a plane, or at home.

5. Flexibility, Functionality, and Efficiency

In the ever-changing business landscape, it can be interesting to witness how some companies adapt themselves, often many years too late. While certain aspects of the business will be harder to adapt than others, it is important to stay as nimble as possible.

6. More Disaster Resistant

Losing important data to a fire or some other disaster at your business premises can devastate your business. Data back-up service providers have preached this message for a long time, but with the availability of cloud services it is now much more convenient to heed the message.

7. Greater Business Competitiveness

New research carried out by Harvard Business Review Analytic Services reported that 74% of businesses feel

adrantage. The main reason that these companies felt like they gained this adrantage is that the cloud enabled them to "capitalize on opportunities more quickly" than competitors.

8. Makes Big Data Easy to Manage

Finally, cloud computing makes it easier for companies to handle so-called "Big Data." Traditional data storage methods (not cloud) have not always provided a simple way for companies to carry out adranced analysis of their databases. In the case of large firms, this process can take many weeks and require highly knowledgeable specialists.