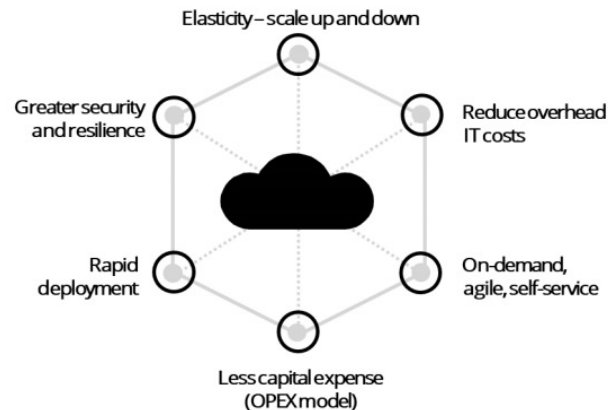


A Glance at Cloud Computing

1. What is Cloud Computing?

Cloud computing is the on-demand, unlimited computer system resources over the internet. It could be used without direct active management by the users. Clients could access those resources from a cloud provider instead of investing in physical IT resources, like physical data centres and servers. And clients only need to pay for what services are used.

We could move all 350 applications on the cloud for our client, which means we do not need any physical IT support. It will reduce our cost and IT infrastructure pressure. It also could increase the ability to maintain the services over the next five years even longer.



2. Cloud Characteristics

- **Cost saving:** less physical IT support and staff member is needed. Clients only need to pay for their consuming services.
- **Agility:** new IT capabilities could be developed and deployed fast. It would increase the competitive ability in the marketplace.
- **Rapid Implementation:** running time is required much less on a cloud system.
- **Broad Network Access:** users could access services from a variety of devices quickly and safely. And no location limitation.
- **Elasticity:** The cloud has essentially unlimited computing capabilities. It could be scaled up or down depends on the needs of an organization's changing.

3. Capabilities for our client

After we move all the applications and services on the cloud-based system:

- Unlimited power constraints on the IT infrastructure, which indicates that the university could sustain the growth needs over the next three years easily even longer time.
- Self-provisioning Cloud has ability that handles the extensive demand for high-computing resources in less time and at no cost on other services and existing facilities.
- Could scale up the needs of an organization. During peak periods, the client could ask to scale up resources to handle the crash problem. Streaming lecture recordings through Cloud services to reduce latency and keep up with peak demand.
- Cloud computing requires less time on monotonous tasks, and it could process tasks quickly. It could reduce time-consuming and increase the university's agility ability.

Benefits of Transitioning to Cloud

A transition to Cloud would provide the University with the following direct and indirect benefits

Direct Benefits:

Scalability

Cloud is on-demand and has unlimited resources. It could scale up or down the size of IT infrastructure depend on the needs. After we move all services to the cloud could lease the power constraints and sustain the clients' needs over the next few years. It also could support yearly growth projections.

Self Provisioning Cloud

Self-provisioning Cloud compute for researchers to enable on-demand compute. And it requires less time, and it could scale up the size to remove the effects on existing facilities.

Automation and Easy of Management

Cloud could automatically refresh and update those applications on the cloud instead of waiting for IT staff to spend lots of time on monotonous tasks. It saves more time to innovate new applications and serve students better.

Flexibility

Cloud allows users to access resources from a wide variety of devices and any location. During peak periods, cloud services could reduce latency and sustain the demand. Cloud is very flexible and speeds fast.

Indirect Benefits:

Cost Savings

Since we do not need to build a data center, the University will achieve upfront cost avoidance. Whilst this will be partially offset by the need to increase investment in Cloud migration, it will drive a reduction in costs long-term through a reduction in IT overheads.

Greater Agility and Time to Market

IT team could quickly develop and deploy new IT capabilities and business processes in less time and at a low cost.

Improved Brand Perception

It will benefit the University's brand and reputation if we move to a full cloud environment. It also could attract more IT students and researchers to collaborate.

Reduced Location Impact

Cloud could connect all users no matter where you are. Even though our client has many international students, the cloud could provide fast, secure, and high-quality services.

Cloud Risks & Considerations

Risks:

Except for the benefits we outlined before, some risks could be addressed when we move our services to the cloud:

- When we move services to the cloud service provider, some of the risk management duties will be transferred to the cloud. Users lose some visibility and control over their resources.
- Cybersecurity risk will be increased since a security gap exists between users and cloud service providers. Users move data to the cloud, but the cloud service provider measures the security. Hence, the cloud service provider may could not fully secure those services.
- Current IT staff may need to improve their skill level. Because migrating to the cloud could introduce complexity in managing, maintaining, and integrating their services.
- We have 350 applications that need to be moved to the cloud, which means our data will be stored over many different storages on the cloud services provider's system. It may cause our data management harder and not secure.

Considerations:

Before we move our services to the cloud, there are some considerations that our client need to consider clearly:

Highly Variable Demand

Whether our services face highly variable demand? Because the cloud will be a benefit and valuable when the demands of our services are highly variable.

Security & Risk Management

Security and risk management need to be considered well before we move to the cloud.

Financial Case

We need to reallocate our IT budget on purchasing cloud infrastructures. It is essential to perform financial analysis to assess potential benefits and costs.

Cloud Readiness Assessment – Cloud Accelerators and Inhibitors

Highlighted below are the key factors that determine whether an application is suitable for Cloud or not

Accelerators

Highlighted below are factors that would signify that workloads are Cloud suitable.



Dev/Test Environments – Sandbox environments can be easily scaled up or torn down on demand in the Cloud and are prime candidates for migration.



Infrequently Accessed Storage Archives – It can be more cost effective to host large storage volumes that do not require frequent or immediate access.



Applications that need huge storage capacity – Applications that required large storage space and may need to be adjusted to meet the growing demand.



Applications that need to be accessed flexibly – Applications that required to be accessed from a variety of devices and locations. The data hosted on cloud could be accessed remotely.



Applications that need to be accessed flexibly – Applications that required to be accessed from a variety of devices and locations. The data hosted on cloud could be accessed remotely.



Existing SaaS Offering – Applications that have an existing Software as a Service offering are simpler to move to Cloud as they do not require any change to the code base but only a change to the subscription model for the service.

Cloud Suitable

Inhibitors

Highlighted below are factors that would hinder the suitability of a workload for Cloud.



High Network Throughput Applications – Applications with high throughput requirements may see performance issues and latency if they are located away from their users.



Heavily Integrated Applications – Applications that are heavily integrated will continue to require a high amount of communication or dependencies with their counterparts. In this case it is recommended that they remain together, be it in the Cloud or on premise.



Privacy and sensitive information – It may not be secure if the cloud used in IT infrastructure without any legal advice.



Geopolitical Concern – Data on each application should follow the government policy when we move the data to cloud.



Hardware Requirement – Application that required any specific hardware resources is not suitable for cloud computing.



Desktop Applications – Desktop applications typically have high performance and low latency requirements; hence, recommended to remain as is.

Less Cloud Suitable

Please note, inhibitors are not part of the ideal answer, and have only been included here for reference.

Cloud Readiness Assessment – Application Prioritisation

Highlighted below are the applications that should be prioritised for the Cloud Proof of Concept and a brief justification as to why

Priorit y	Application	Justification
1	Echo360	<ul style="list-style-type: none">This platform has a large volume of users and high volatility. And all of the contents could be accessed for all students and staff from various devices and from anywhere. It is also a development test environment, which means it could quickly scale up or down on-demand in the Cloud. Furthermore, this website did not require any specific hardware resource.
2	Enrolments Plus	<ul style="list-style-type: none">This system has a large volume of users since all students use it to apply for classes during the year. And the data sensitivity is low. This website is a development test environment, which indicates that it could be easily scaled up or down on demand.
3	Learning Management System	<ul style="list-style-type: none">This platform is used to find all subject's information and announcements, which indicates that the user volume is large. And it currently offers SaaS, and the data amount is significant. It is also in a development test environment that could scale up or down on demand.
4	Student Feedback Survey	<ul style="list-style-type: none">This application has a low degree of integration, and data size is small. The application also has some development and test environments and does not contain sensitive information making it a low risk option for Cloud transition.
5	SharePoint	<ul style="list-style-type: none">SharePoint has existing SaaS offerings which would accelerate its transition to Cloud. And It is volatile, but does not have much in the ways of integration or sensitive data.