THE EDUCATION IS EMBRACING CLOUD COMPUTING DUE TO ITS OFFERING OF TECHNOLOGICAL CAPABILITIES AND COST SAVINGS

Cloud Computing in Education

- Overcoming the looming IT cost for Educational Activities
- Fulfilling IT needs and demands of the users and organizations

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Motivation

Due to the growing need of educational institutes, organizations have to spend a large amount on their infrastructure to fulfill the needs and demands of the users and organization. These needs may include:

Cost

Inefficiency

Complexity

- The adequate distribution of resources like teaching tools, teaching materials.

- Adequate collaborative platform within and between researcher groups and remote delivery of IT services.

- Adequate platform and computation resources for high end computational intensive research

- Active monitoring of the quality of research activities carried out by institution and researchers.

- A centralized system to check administrative performance of educational institutes and their personnel.
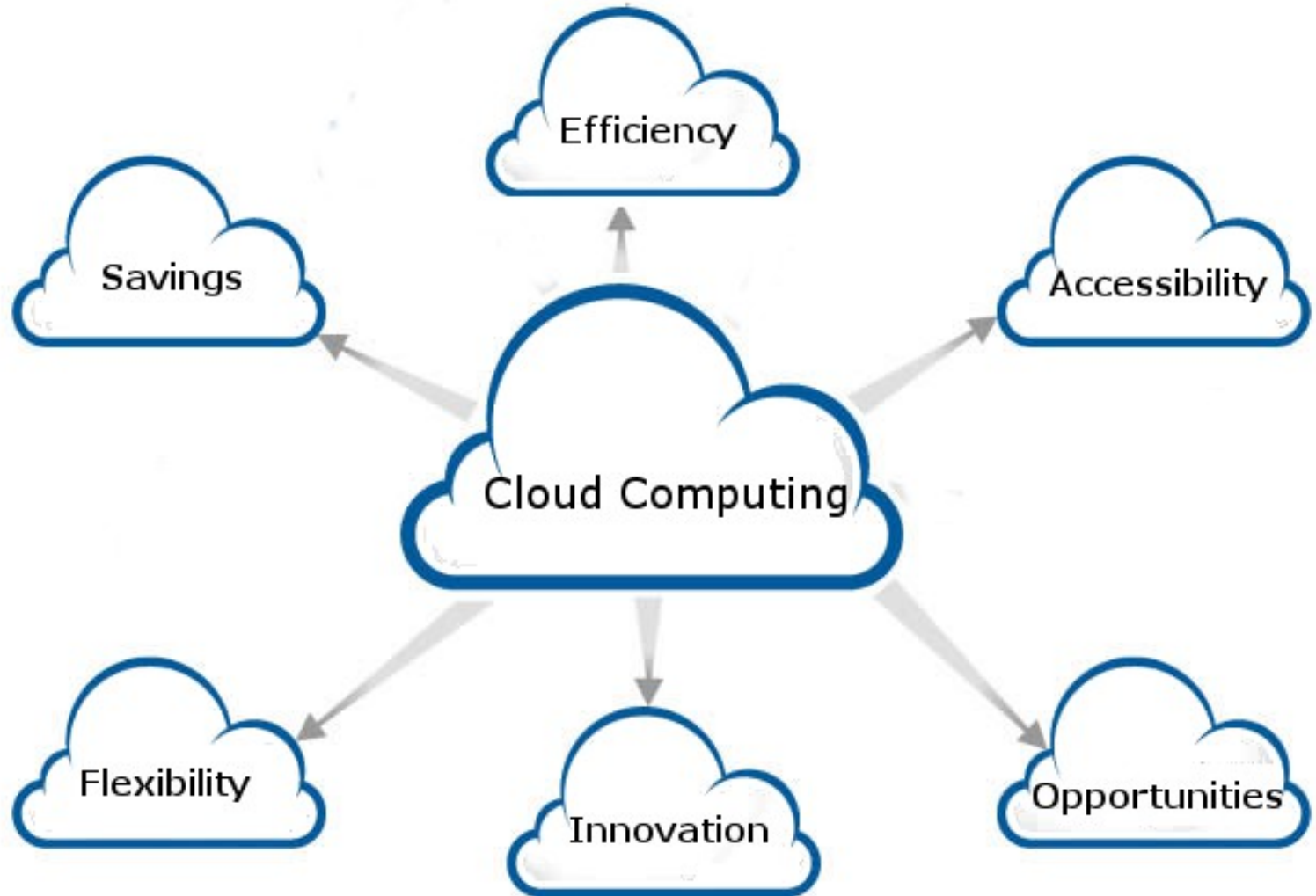
- Adequate funding and expertise for IT management.

Cloud Computing
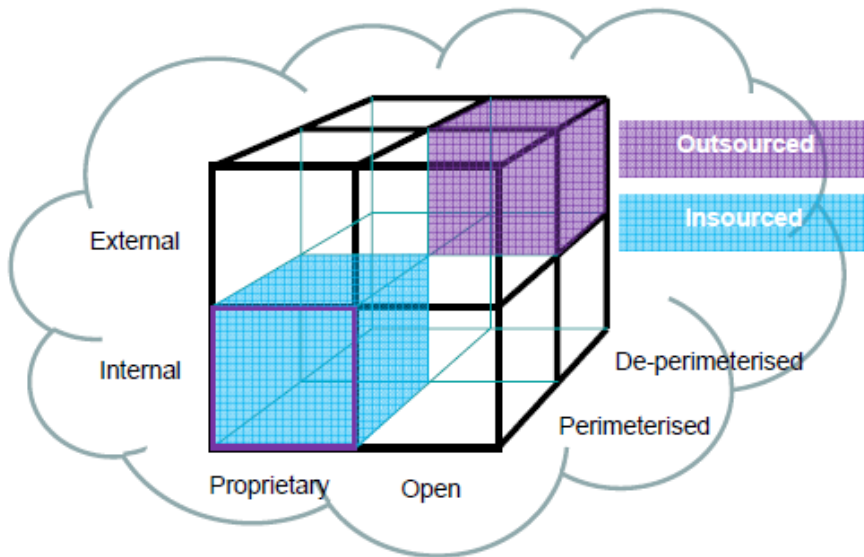
"Cloud Computing is a large-scale distributed computing paradigm that is driven by economies of scale, in which a pool of abstracted, virtualized, dynamically-scalable, managed computing power, storage, platforms, and services are delivered on demand to external customers over the Internet.

Cloud Benefits
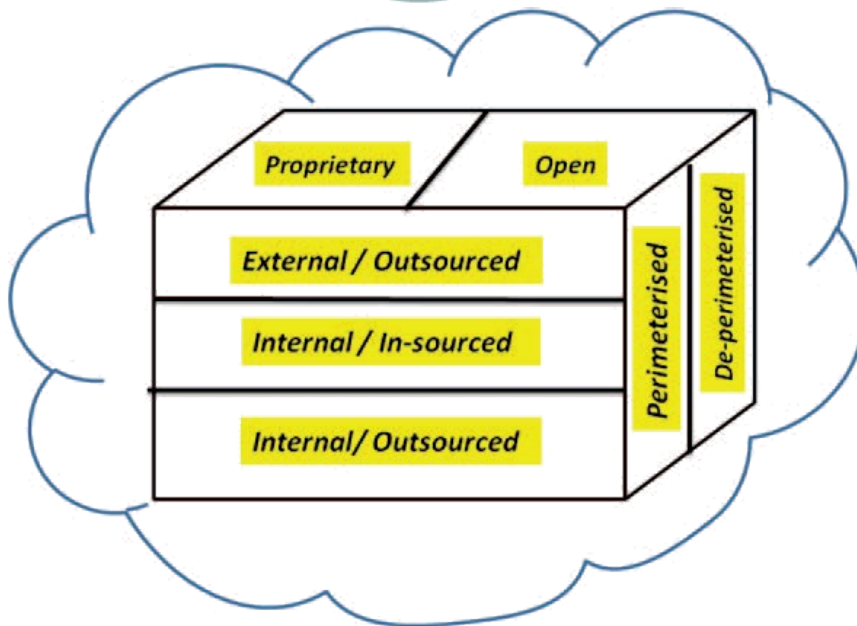
Cloud Cube Model(CCM)

Model

Formation

DIMENSION:

1. *Internal / External*
   Physical location of the Cloud

2. *Proprietary / Open*
   Ownership of the cloud technology, services, and interfaces

3. *Perimeterised / De-perimeterised Operation*
   Architectural mindset - is the cloud operating inside traditional IT perimeter or not

4. *Insourced / Outsourced*
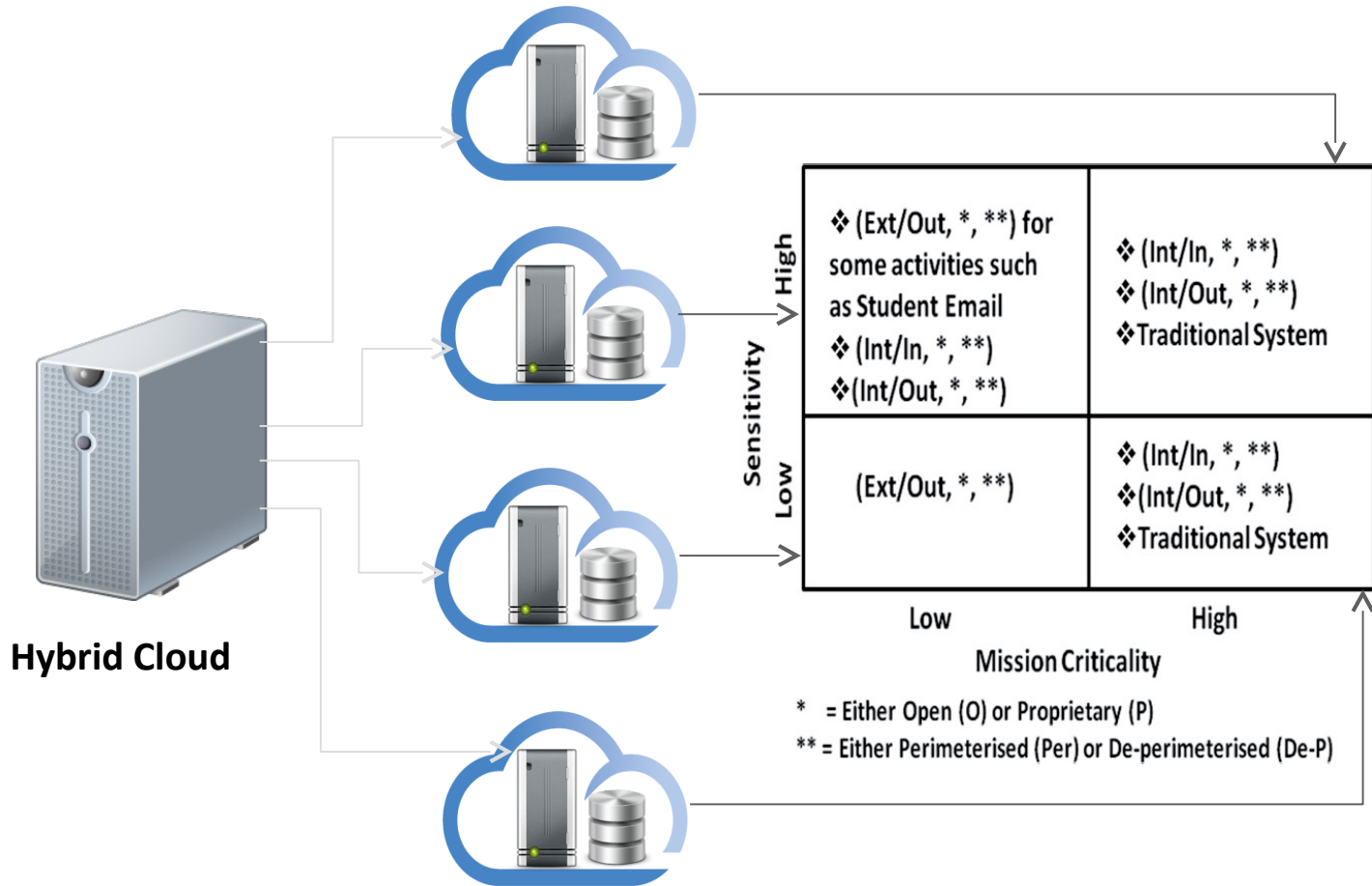   Are the services provided by third parties of own staff.

Educational IT Activities

Sensitivity	Mission Criticality	
	Low	*High*
High	• Sensitive Research Activities • Student Email	• Students Records • Staff Records • Faculty Records • Medical Records • Administrative (Finance, Purchasing, etc.) • Backup of Sensitive Information
Low	• Alumni Email • Student Projects • Websites for Faculty, Students, Staff, and Classes • News & Announcements • Non-sensitive Research Activities	• Faculty & Staff Email • E-learning • Mobile learning • Backup of Non-sensitive Information

- **Mission criticality** parameterizes the relation of the activity to the core services of the organization.
- **Sensitivity** is concerned about privacy, security, data integrity, intellectual property management, audit trails, and other issues.

Cloud in Education (ELaaS)

Hybrid Cloud

	Low	High
High (Sensitivity)	❖ (Ext/Out, *, **) for some activities such as Student Email ❖ (Int/In, *, **) ❖(Int/Out, *, **)	❖ (Int/In, *, **) ❖ (Int/Out, *, **) ❖Traditional System
Low (Sensitivity)	(Ext/Out, *, **)	❖ (Int/In, *, **) ❖(Int/Out, *, **) ❖Traditional System

Mission Criticality

* = Either Open (O) or Proprietary (P)

** = Either Perimeterised (Per) or De-perimeterised (De-P)

ELaaS is based on hybrid cloud including cloud and non-cloud based solutions.

Conclusion

Architecture

Conceptual Framework

Physical Implementation

- Cloud computing provides solution for financial constraints, sustainability challenges and inadequacy of infrastructure in education systems
- ELaaS presents a general conceptual framework that is conducive for implementing clouds of academic institutions
- Hybrid clouds are a better choice as a trade-off between technological limitations of clouds, sensitivity and mission criticality of IT activities.

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