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:

- 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. (Foster, Ian, et al., 2008)”
Cloud Benefits

- Efficiency
- Savings
- Accessibility
- Flexibility
- Innovation
- Opportunities
Cloud Cube Model (CCM)

**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 or own staff.
Educational IT Activities

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Mission Criticality</th>
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<tr>
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<td>Low</td>
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<tr>
<td>High</td>
<td>Sensitive Research Activities</td>
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<tr>
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<td>Student Email</td>
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<tr>
<td>Low</td>
<td>Alumni Email</td>
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<td>Student Projects</td>
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<td>Websites for Faculty, Students, Staff, and Classes</td>
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<td>News &amp; Announcements</td>
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<td>Non-sensitive Research Activities</td>
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**Cloud in Education (ELaaS)**

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

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<tr>
<th>Low</th>
<th>High</th>
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<tr>
<td>(Ext/Out, *, **) for some activities such as Student Email</td>
<td>(Int/In, *, **)</td>
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<td>(Int/In, *, **)</td>
<td>(Int/Out, *, **)</td>
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<tr>
<td>(Int/Out, *, **)</td>
<td>Traditional System</td>
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* = Either Open (O) or Proprietary (P)  
** = Either Perimeterised (Per) or De-perimeterised (De-P)
Conclusion

- 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.
References


