

Cloud computing in the field of education

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Abstract:

Cloud computing is also known as “on-demand Computing”, is use for sharing Data, Resources and Information. Cloud computing has now become a highly demanded service. Cloud Computing is one of the important and popular internet computing. It emerges as a new computing paradigm which aims to provide reliable and customized computing environments for end-users. From the past few years, there has been a rapid progress in Cloud Computing. Today's IT professionals in educational institutions need to respond quickly to increasing demands from students and faculty, while coping with fixed or declining budgets and staff. In this challenging environment, cloud-based computing has become an increasingly attractive option for delivering education services more securely, reliably, and economically. In today's higher education environment, IT organizations must keep pace with a long list of competing demands. This paper has discussed the concept of Cloud Computing in education and on the basis of this issue analyzes its impact and advantages in the field of education.

Keywords: SaaS, LMS, ROI, CapEx, OpEx.

Introduction

It is one of the fastest-growing industries in the world. The need and demand of education never goes down. Cloud computing in education opens avenues for better research, discussion, and collaboration. It also provides a software desktop environment, which minimizes hardware problems. Cloud computing also enables classes to be run on remote locations.

The benefits of cloud computing are that outside entities might be more sophisticated at managing personal data. These entities may be able to manage data more inexpensively and effectively than the educational institution could do itself. In many cases, cloud computing providers can provide better security than the educational institutions can.

The risks of cloud computing are that educational institutions no longer have as much control over the personal data. They must rely on the cloud computing provider to have the appropriate practices and policies to ensure that data is properly maintained, handled, used, or disclosed.

One risk is that a cloud computing provider can outsource some functions to countries that have little to no legal privacy protections. In one

instance, a university medical center outsourced transcription of its medical records to a company in California, which then subcontracted with a person in Florida, who subcontracted with a person in Texas, who ultimately subcontracted with a person in Pakistan. The person in Pakistan wasn't paid by the person in Texas, so she wrote to the medical center and threatened that she would expose all the records unless the medical center got involved and made the Texas person pay. This example illustrates how easy it is to lose control over information when it is outsourced.

There are benefits and risks to cloud computing, but the benefits can be enhanced and the risks greatly reduced if educational institutions take care and vigilance in selecting cloud computing providers and in monitoring the relationship to ensure that the provider is adequately protecting the data.

The Family Educational Rights and Privacy Act (FERPA) unfortunately provides little guidance about the selection of cloud providers and the management of these relationships. According to Department of Education, "nothing in FERPA prevents an educational institution from contracting with a person or entity outside the institution to perform services that the institution

would otherwise provide for itself." FERPA merely requires one condition - that "the party to whom the information is disclosed will not disclose the information to any other party without the prior consent of the parent or eligible student."

But there are many other important responsibilities for cloud computing providers that FERPA ignores, such as providing for appropriate security and having adequate accountability architecture in place. That architecture consists of having officials responsible for the privacy and security of the data (data stewards), doing routine assessments of risks, having a meaningful system of oversight and monitoring to ensure compliance, and having a training program for employees to minimize security lapses and mistakes. I provide such training programs through my company, Teach Privacy, and I am doing so because I am a strong believer that education can work. Many privacy and security incidents are caused not by technical issues but by the human factor - the small errors people make out of carelessness or ignorance that can lead to big problems. Educational institutions should insist on cloud computing providers that provide such education - after all, educational institutions should be ardent believers in education.

Prior to engaging in business with a cloud computing provider, an educational institution should conduct due diligence on the provider and make sure that the provider has a good reputation and good privacy and security practices. The educational institution should ask the provider for details about how it stores the data, how it protects the data, and where that data is stored, as the data might be stored in a country where the government can access data without adequate restrictions.

When contracting with a cloud computing provider, an educational institution should be sure that the contract has sufficient provisions to ensure that the data is protected. An educational institution should never just outsource it and forget about it. Even when the data is outsourced to others, the buck always stops with the educational institution, which remains the primary institution with responsibility over that data. A privacy or security incident at a cloud computing provider doesn't just tarnish the reputation of that provider, but it also can injure the reputation of the institution that trusted the cloud computing provider - especially if the institution didn't do enough to ensure that the provider was taking adequate care of its data.

In essence, giving data to a cloud computing provider should be viewed as akin to sending children to daycare. Great care and vigilance is required both in selecting a provider and in ensuring that the provider meets its obligations and performs well.

What should contracts with cloud computing providers require? I recommend the following:

- The cloud computing provider should agree to maintain the confidentiality of the data.
- The cloud computing provider should have appropriate technical, administrative, and physical security safeguards to protect the data.
- The cloud computing provider should destroy all personal data that is no longer needed. If the relationship with the cloud computing provider is terminated, the provider should not retain any of the personal data that it had previously processed for the educational institution.
- The cloud computing providers should abide by the educational institution's privacy policies.
- The cloud computing provider should have appropriate training of its employees regarding following the educational institution's policies and safeguarding the security of the data. Policies are meaningless unless there is training to back them up.
- If cloud computing providers desire to subcontract any of their functions to other cloud computing providers, they should be required to first seek the educational institution's prior approval.
- The educational institution should circumscribe the ways in which the cloud provider can use the data. Data should only be used for the purposes related to providing the cloud computing service. If the cloud provider engages in uses for other purposes, these purposes should be clearly defined and limited. Educational institutions should be careful when authorizing other uses, as such uses could conflict with FERPA or other federal or state laws. Any such uses should be incorporated into the privacy policies of the educational institutions when they gather the data so that people are on notice about them.

- The educational institution should ensure that they can impose appropriate sanctions upon the cloud computing providers if the providers fail to live up to their requirements to provide good privacy and security.

Once the contract is underway, that isn't the end of the educational institution's responsibilities. The educational institution should engage in routine assessments about how cloud computing providers are performing in their duties to provide privacy and security safeguards.

In today's higher education environment, IT organizations must keep pace with a long list of competing demands:

- Deploy applications and deliver student services at a rapidly accelerating rate
- Provide effective strategy, support, and standardization to efficiently meet the demands of the many departments, schools, and organizations that IT must support as part of their university community
- Compete against other universities, many of which differentiate themselves in the market based on the services they offer to students
- Scale to meet expanding needs, often without a proportionate increase in budget for hardware, software, and personnel
- Reduce CapEx (capital expenditure) and OpEx (operational expenditure) costs while maintaining the highest levels of security and privacy
- Manage the day-to-day demands of the data center while enabling an innovative, technologically advanced educational environment for faculty and students

Balancing these demands is far from easy. Even as students ask for a growing number of services, traditional IT infrastructure remains relatively inflexible. At many universities, disparate departments make buying decisions without relying on an overall technology strategy. Meanwhile, IT teams find it more and more difficult to accommodate the proliferation of

personal devices — including tablets, smartphones, and laptops — that students bring into the campus environment. And with privacy concerns increasing every year, many IT organizations are unsure how to maintain robust security in the long term.



Some Major Questions

As IT organizations consider the possibilities of cloud migration in a higher education environment, they commonly ask the following questions:

- Does cloud computing make sense for our college or university?
- How can we anticipate the challenges of migrating to a cloud architecture and make the transition easier?
- How can we plan and build a cloud architecture that comes in on time and on budget?
- How does the cloud affect our security and the security of our users?
- How can we achieve an optimal balance between public and private cloud computing?
- Can cloud computing help our IT team focus more of its efforts on enhancing the educational experience for faculty and students?
- How can we measure the benefits of cloud computing and make sure that we will see a return on investment (ROI)?
- Can we customize our cloud strategy in order to realize maximum benefit and help ensure ongoing cost reductions?

a traditional school environment simply doesn't work, and these students now have many options for pursuing alternative forms of education.

How Is Cloud Computing Being Applied In Education?

Many educational institutions have begun their movement to cloud computing by outsourcing their student email provision. Email is a basic, fairly standardized service, can be provided easily by third parties, and is arguably not core to the educational mission. Both Google and Microsoft offer email services for free to the educational sector in many countries. These two companies provide email as a part of larger application suites which are usually made available to students alongside email. Google Apps for Education and Microsoft Live@edu contain other communication tools such as instant messaging along with contact management and calendar software. There is also document create on applications allowing the products on of word processed documents, spreadsheets and presentations as well as the ability to create websites. These can all be edited collaboratively with other users. Significant storage space for documents of all types are offered to users who can continue to use these once they leave the institute on. Why are the services provided for free to educational institutions? There are a number of advantages to companies who are currently competing for market share. Software has always been provided at a discount to the educational sector and vendors seek to build relationships with the institutions which provide their future employees. In addition, they are building brand awareness and loyalty which may lead to the selling of other or premium services to institutions and users in the future. A student seeing the benefit of these tools may persuade a future employer to invest in the commercial equivalents which provide a more revenue source to the cloud providers. Educational institutions are also beginning to use lower level cloud services for purposes such as data storage. This may be attractive where data security is of lower concern such as where video and audio is provided as open educational resources. Another use of cloud computing which is beginning to emerge in education is for the hosting of institutional

learning management systems (LMSs) in the cloud. Outsourcing the provision of LMSs such as Blackboard or Moodle to a third party makes sense for institutions who cannot justify the costs of purchasing, maintaining and supporting hardware and software themselves.

Conclusion:

The conclusion of this paper is cloud computing is not only reducing costs, but also creating an environment where all students can have access to high-quality education and resources. Whether you are an administrator, a teacher, a student, or the parent of a student, now is a great time to explore how cloud-based applications can benefit you, your children, and your school. "Cloud computing is the future of Education".

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Biography

MANOJ CHORPA



Education :

Prof. Manoj chopra received the Master Degree in M.Sc. (Computer Science) from Makhan Lal University 2008 and M.Phil. in Computer Science from Vinayaka Mission University in 2009 and pursuing Ph.D. from AISECT University, Bhopal.

Work Experience:

He stayed in various Colleges of computer and communication. He has More Than 8 year of teaching experience. He is now with Bonnie Foi Group of Research and Education Society, Bhopal (M.P.)