CLOUD COMPUTING AND INFORMATION POLICY IN ACADEMIC INSTITUTIONS

Dogiparthy Shravan Kumar

Lecturer in Computer Science

Gov City College(A),

Hyderabad

Abstract:

Cloud computing is an emerging innovative IT-based business model which is attracting the attention of practitioners, for its potentiality of industry adoption, as well as of academicians, for research undertaking in different dimensions. Despite having a number of business benefits and research scope, there is no universally accepted comprehensive, conceptual definition for cloud computing. Though different experts and academicians have given different definitions to cloud computing, none of them have identified all the key characteristics of cloud computing.

Introduction

Cloud computing services are application and infrastructure resources that users access via the Internet. These services, contractually provided by companies such as Apple, Google, Microsoft, and Amazon, enable customers to leverage powerful computing resources that would otherwise be beyond their means to purchase and support. Cloud services provide services, platforms, and infrastructure to support a wide range of business activities. These services support, among other things, communication; collaboration; project management; scheduling; and data analysis, processing, sharing, and storage. Cloud computing services are generally easy for people and organizations to use, they are accessible over the Internet through a variety of platforms (workstations, laptops, tablets, and smart phones), and they may be able to accommodate spikes in demand much more readily and efficiently than in-house computing services.

CLOUD COMPUTING: Like most technologies, cloud computing evolved from a need. The tremendous growth of the Web over the last decade has given rise to a new class of "Web-scale" problems—challenges such as supporting thousands of concurrent e-commerce transactions or millions of search queries a day. The natural response of technology companies has been to build increasingly large data centres to handle the ever-growing load; these data centers consolidate a great numbers of servers (hundreds, if not thousands) with associated infrastructure for storage, networking, cooling, etc. Over the years, technology companies, especially Internet companies such as Google, Amazon, eBay, or Yahoo!, have acquired a tremendous amount of expertise in operating these large data centres. This "know-how" extends beyond physical infrastructure to include experience with process management and other intangibles. Cloud computing represents a commercialization of this combined solution.

The tremendous amount of information available in electronic format today has

translated into a proliferation of data- and processing-intensive problems for a wide variety of organizations and even individuals, in the context of the Web and beyond. For example, genomics research involves huge volumes of sequence data; financial companies maintain mountains of information about clients; even the serious hobbyist may have more video footage than can be reasonably processed by available machines. Common to all these scenarios is the need for large amounts of processing power. Prior to cloud computing, acquiring such resources was an expensive proposition. Upfront capital investment in purchasing the computers themselves is only the initial step; significant resources must then be devoted to maintain the infrastructure. In many cases, users (especially smaller companies, nonprofit organizations, and academic research groups) are unable or unwilling to make this investment.

Purpose

This policy outlines best practices and approval processes for using cloud computing services to support the processing, sharing, storage, and management of institutional data at Govt City College, Hyderabad.

Scope

All Govt City College, Hyderabad, staff, and students.This policy concerns cloud computing resources that provide services, platforms, and infrastructure that provide support for a wide range of activities involving the processing, exchange, storage, or management of institutional data. This policy does not cover the use of social media services, which is addressed in the Social Media Policy.

Definition: Cloud computing services are application and infrastructure resources that users access via the Internet. These services enable customers to leverage powerful computing resources that would otherwise be beyond their means to purchase and support. Cloud services provide services, platforms, and infrastructure to support a wide range of business activities

Policy/Procedure

1. Storing or transmitting of level 1 data as defined CSU Information Security Policy Data Classification Levels by is prohibited on all cloud services unless:
a. Contracted through the ITS-Solutions Consulting group
b. A contract with vendor contains appropriate Information Security Supplemental Language
c. Utilization of the service is approved by the appropriate data owner
d. Approval is granted by the Information Security Office and approved by the President or Vice President
e. The cloud service must be configured to utilize the campus multi-factor service Duo or other approved multi factor solution. In accordance to CSU Information Security Policy - Section 8. Cloud Storage and Services.

2. Storing or transmitting of level 2 data as defined by CSU Information Security Policy Data Clasification Levels is prohibited on all cloud services unless:
a. Contracted through the ITS-Solutions Consulting group
b. A contract with vendor contains appropriate Information Security Supplemental Language
c. Utilization of the service is approved by the appropriate data owner

d. Approval is granted by the Information Security Office and approved by the President or Vice President
e. The cloud service must be configured to utilize the campus multi-factor service Duo or other approved multi factor solution. In accordance to In accordance to CSU Information Security Policy - Section 8. Cloud Storage and Services.

3. Cloud application administrators are responsible for maintaining accurate and timely user account status
a. Terminated users must have their account to the cloud service disabled no later than the day of termination.
b. Accounts should be provisioned with the Principle of Least Privilege

4. Cloud application administrators are responsible for reviewing all accounts and their associated level of application access on a quarterly basis
a. Active accounts should be compared to employee records. Any terminated users should have their accounts removed or disabled.

5. Cloud application administrators are required to provide an annual report of compliance with this policy.
a. Once a year on November 1st any administrator of a cloud-based SaaS application will be required to provide a listing showing all the accounts and their associated rights or privilege level associated to that account to the Information Security Officer (ISO). More information about this process can be found in the Cloud Audit procedures document.
b. Application Owners of applications that manage Level one data must work with the cloud application vendor to get the updated SOC 2 audit and cyber liability insurance certificate of insurance (COI) on an annual basis and post those documents with the Information Security Officer (ISO)no later than November 1st of every year. Failure to maintain these reporting requirements will lead to the violating application being blocked from running on the campus network.

Policy Statement Download the full policy (PDF version).

For more details about cloud computing see "The NIST Definition of Cloud Computing."
Considerations Regarding Cloud Computing Services **Most cloud services, such as Google Docs, make it easy for individuals to sign-up and use (self-provision) their services via an end user license agreement (EULA), often at no monetary cost. Tufts also locally or centrally acquires cloud services, such as the survey tool Qualtrics, for use by members of the Tufts community.**

Govt City College faculty , staff, and students must be very cautious about self-provisioning a cloud service to process, share, store, or otherwise manage institutional data (as defined by the Information Stewardship Policy). Self-provisioned cloud services may present significant data management risks or are subject to changes in risk with or without notice. Virtually all cloud services require individual users to accept click-through agreements. These agreements do not allow users to negotiate terms, do not provide the opportunity to clarify terms, often provide vague descriptions of services and safeguards, and often change without notice.

Risks with using self-provisioned cloud services include:

- Unclear, and potentially poor access control or general security provisions
- Sudden loss of service without notification
- Sudden loss of data without notification
- Data stored, processed, or shared on cloud service is often mined for resale to third parties that may compromise people's privacy
- The exclusive intellectual rights to the data stored, processed, or shared on cloud service may become compromised.

GUIDELINES FOR SELECTION AND DEPLOYMENT OF CLOUD SERVICES

Functionality: The list should include the functionality required by users. In the case of email for example this may include the use of a POP client instead of the web based software or out of office messages for display when on holiday. For document storage, issues to consider may include the total allocation per user and the types of files that can be stored. For office applications, file compatibility may be of concern, particularly if documents created using the cloud software may later be viewed using different providers' applications. It is also helpful to assess the level of integration between the different applications provided within a product suite. Platform The plaŋorms on which the applications are provided should be assessed. Ideally the software will function the same on all devices, operating systems and web browsers but this is unlikely to be the case. It may be necessary to advise users to use particular plaŋ norms. Access from mobile devices is becoming increasingly important for many students. Technical issues The institution may have to carry out some technical integration work such as automating the creation of user accounts on the cloud system based on data held in student information systems or facilitate single sign-on across systems. There may also be a necessity to monitor usage, remove accounts or perform other systems management activities.

User experience and accessibility Some systems may provide a better overall user experience than others. Usability is important – a necessity to install any so ware additional to the web browser may make the software less for example. Use by disabled users is one issue that requires to be considered for ethical and legal reasons. Organizations wishing to deploy cloud services should therefore ensure that the soft ware conforms with web accessibility guidelines and standards. Contract The provider will have a standard contract which should be studied closely. Larger institutions are at greater risk and may wish to seek legal advice before signing the contract. Issues which should be examined include the initial term of the contract, penalties for early withdrawal, costs and future potential costs.

The service level agreement may provide institutions with compensation in the event of breaches of service. In the case of free services, compensation may be restricted to the provision of extensions to the contract and consequently may provide reassurance to customers who may be advised to consult with other users of the services in advance of deployment.

Support is another issue. For cheap or free services an institution is likely to have to provide the direct user support itself, escalating issues to the provider only via a limited group of institutional staff . Most high level cloud services are however easy to use and either require minimal support.

Costs : While costs for cloud services may appear minimal or even non-existent, the real costs to institutions can be considerable. It is helpful to estimate costs for any legal advice associated with the contractual negotiations, project and change management, technical integration and staffing an institutional helpdesk.

Matrix of cloud services

Below is an excerpt from our approved list of cloud services. The entire list can be found within CSUB Approved Cloud Services document. If you see a "No" then having that level of data within that service is prohibited.

Examples of CSUB Approved Cloud Services

Solution	CSU Level One Data	CSU Level Two Data	CSU Level Three Data
Office 365 Email	No	Yes	Yes
Office 365 OneDrive	No	Yes	Yes
Office 365 Sharepoint	No	Yes	Yes
Groups/Team	No	Yes	Yes
Box	No	Yes	Yes
Secure Box **	Yes	Yes	Yes
Zoom	No	No	Yes
Qualtrics	No	No	Yes
Learning Management System	No	Yes	Yes

** The following services must be configured by ITS specifically for you.

Note: Please see CSUB Approved-Not Approved Cloud Service document for full list.

Examples of Cloud Services not contracted by CSUB

Solution	CSU Level One Data	CSU Level Two Data	CSU Level Three Data
Dropbox	No	No	Yes
Google Mail	No	No	Yes
Yahoo Mail	No	No	Yes

Note: Please see CSUB Approved-Not Approved Cloud Service document for full list.

POLICY IMPLICATIONS: There are significant policy implications of cloud computing in the context of education at institutional, regional, national and even international levels. At a local level, as has been noted earlier, the roles of computing personnel may evolve from providing services to procuring and monitoring cloud services and relations with cloud computing providers. Staff will have to monitor the rapidly evolving landscape of cloud computing and plan ahead for renewal of service contracts.

To make full use of the cloud, institution will need to put aside their fears about data security in particular and manage the risks by ensuring appropriate contractual arrangements with providers. They will also have to accept that users will

increasingly be able to by-pass institutional policies over computing provision and live in an environment where Applications are subject to rapid upgrades outside the control of the institution. The ownership of data needs to be clearly established within the contract. Contracts for cloud services should assert that ownership of the data stored in the cloud is retained by the customer. Educational institutions may then wish to re-assign ownership to the user who uploaded the content. Where any educational materials are being stored in the cloud, new intellectual property rights clearance may have to be carried out.

Contractual negotiations for cloud computing services may be carried out by regional or national l education on authorities than by individual schools, colleges or smaller universities who do not have access to expensive legal services. There may be additional advantages here in that multiple institution ns become part of one "cloud", facilitating cross-institutional data sharing and collaboration.

FUTURE SCENARIOS:

The inertia a of educational institutions and their risk averse nature means that they are likely to be slower than business to migrate key services to the cloud. They also have unique requirements relating to their teaching methods, examination regulation funding regimes, government policies and legal issues which necessitate bespoke applications less suitable for migration than generic services such as email. It seems likely that it will no longer be economically viable for institutions to host their own email systems, though in certain circumstances, such as defence research, this may continue to be necessary. As bandwidth increases globally and increasing numbers of students have adequate access to the Internet, many through mobile devices, they will become more comfortable with using rapidly evolving web-based applications and storing their data online rather than on their own storage devices which are more likely to be lost or corrupted. Demand for cloud applications may therefore be driven by users rather than by institutions.

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