Cloud computing is a computing model in which technology resources are delivered over the Internet.

Rather than implementing and maintaining IT services locally, customers of cloud computing buy IT capabilities from providers that manage the hardware and software that operate those services.

Resources including infrastructure, software, processing power, and storage are available from the cloud.

Cloud computing can provide greater flexibility and improved levels of service, while making costs more transparent and increasing institutional efficiency.

The cloud changes how IT services are provisioned and deployed.

- **Nimbleness and agility.** When a new service or additional capacity is needed, institutions can contract with a provider that specializes in those services, avoiding the cost and time of procuring new servers and deploying new resources. When a service is terminated, the institution is not sitting on unused hardware and software.

- **Access to specialized skills.** Cloud providers focus on certain services and cultivate the needed staff competencies, which cloud customers can access without increasing in-house staff.

- **Changing work styles.** Users increasingly need access to files and applications from smartphones, tablet computers, and other devices, and the cloud allows access from any Internet-connected device.

Cloud computing supports a different financial model for IT.

- **Pay as you go.** Rather than investing in hardware, software, facilities, and staff to operate IT services, institutions can obtain needed resources from cloud providers. IT services experience peaks and troughs of usage, and with cloud computing, cloud providers own the capacity and institutions only pay for what they use.

- **Greater transparency and accountability.** The cloud model tends to provide greater transparency of usage, allowing a more detailed picture into how much of an IT resource a department or even individual users consume. This data can lead to greater accountability in the costs of IT, and it allows users to monitor and track their own usage.

- **Strategic focus.** As certain technology services and resources become commodity products, colleges and universities can use the cloud to refocus scarce IT budgets on those services that provide added value and institutional differentiation.

Understand the drawbacks, but beware complacency.

As with any new and evolving approach to business processes, cloud computing involves certain risks, but it’s important also to understand the risks that institutions might incur by not pursuing cloud options, at least for certain services.

- **Risks of doing it**

  - **Security.** Hosting data and applications outside the institution’s data center and network introduces very real concerns about the security of that information. Security expectations and regulations vary by institution, and thorough due diligence is vital for any cloud arrangement.

  - **Control.** Cloud arrangements require institutions to relinquish a certain amount of control over IT systems and services to the providers. Higher education has historically been reluctant to give up such control, and each institution must find its own level of risk tolerance in this context. Effective cloud relationships rely on a high level of trust between institution and provider.
Access. Cloud contracts should be specific about levels of access, allowable times for routine maintenance, provisions for interruptions for service, enforceable penalties for violations of the terms of the contract, and contingencies for what happens to the institution’s data if the provider ceases to function or merges with another provider.

Risks of not doing it

Security. Given the growing complexity of IT security threats and tools to mitigate them, in some cases a cloud provider could potentially provide more security than an individual campus is able to provide on its own. The high level of specialization that cloud providers have in a particular market allows them to develop a level of expertise that many institutions would find prohibitive.

Support. In many cases, cloud providers can provide higher levels of support for their services than a campus could. Specialization allows cloud providers to develop deep expertise in the maintenance and operation of those tools.

Efficiency. An IT department responsible for supporting the full range of needed services and resources will suffer some level of inefficiency. Cloud providers can take advantage of economies of scale that are not available to individual campuses.

Control. Individual students or faculty can avail themselves of cloud services and bring those services onto campus networks through devices they own. By having an institutional responsibility for cloud services, IT departments can retain some amount of oversight over how those services are configured and used.

Cloud computing is not a one-size-fits-all proposition.

Evaluating readiness. A wide range of infrastructure and application services are available though cloud computing. Each college or university must weigh factors including cost, risk, and culture against institutional goals to determine which areas could benefit from cloud options.

The right mix. Over time, each institution will likely develop its own unique mix of sourcing options for IT services, with some resources coming from the cloud, while services that are seen as strategic or that provide differentiation might be provided by in-house IT staff.

Changing options. The landscape of cloud services and the network infrastructure that supports them is constantly changing. As a result, cloud services that are not appropriate today might become better candidates over time.

Public or private. Public or “consumer” clouds provide undifferentiated services to virtually any user at relatively low costs; private clouds, which are restricted to certain groups of users, can have higher levels of security and customization. Matching an institution’s IT needs with the appropriate type of cloud is another important consideration.

Cloud Computing in Practice

More than half of U.S. colleges and universities have moved student e-mail to a cloud provider; the vast majority using either Gmail or Microsoft’s Live@Edu. Some of these implementations are several years old, and many other institutions are considering such a move. Contract terms can be tricky, given the differences between policies at many campuses, but institutions that have made the switch report positive feedback from users, many of whom use a service such as Gmail anyway, as well as other benefits. Although even “free” e-mail services have overhead costs, most institutions have seen costs decline and have been able to redirect those resources to other areas. In many cases, the performance and reliability of e-mail are improved, and cloud-based e-mail fits well with the emerging mobile culture in which users need to have access to e-mail, contacts, and a calendar from a laptop, a tablet, or a smartphone.

The cloud shifts priorities.

Contracts and integration. Operating effectively in a cloud environment means developing a different set of skills among IT staff. The ability to understand, negotiate, and oversee third-party contracts becomes vital, as well as the expertise to ensure that various systems, hosted by different providers, are smoothly integrated.

Sample contracts. Several organizations provide sample contracts and service level agreements to educate institutions about contract terms and exit strategies and to facilitate productive negotiations with providers.

A focus on policy. Effective cloud arrangements are as much about policy as technology. In many cases, the technology is fairly straightforward, but integrating cloud services into an institutional culture requires rethinking existing policies—about data stewardship, privacy, risk—or developing policies that don’t currently exist.