

JENZABAR WHITE PAPER

The Growing Role of Cloud Computing in Higher Education



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TRANSCENDING EDUCATION

Higher education IT leaders are under great pressure to lead their institutions towards a digital transformation that can enable seamless and personalized student experiences, improved business continuity and efficiency, innovative ways to stay competitive, and, most importantly, deliver on student success. Achieving these goals requires many campuses to move their IT infrastructure to the cloud.

From a high level, a cloud computing environment means that the computer hardware, software, and data institutions use is not necessarily sitting somewhere physically on campus. Instead, these resources are accessed over the internet and are provided and managed as a service by a third party. The cloud is often at the crux of a digital transformation, which means that many higher education institutions are investigating, embracing, and even fully adopting cloud technologies to lead and support their own innovation.



Now that we are hosted in the cloud. I don't have to worry about doing backups all the time. I don't have to worry about doing the upgrades. It's in the cloud, so I don't have to worry about my system going down. I used to have sleepless nights worrying about if my server was going to crash at any time, and I don't have that anymore.

Brian Clay
CIO
Philander Smith College



How Can the Cloud Help Higher Education Institutions?

In the higher education environment, the cloud can introduce a range of benefits that can help institutions improve operational stability, increase efficiency, and even reduce costs. Here are some of the reasons why higher education institutions should leverage the cloud.

Reduce Costs

- ▶ Hosting applications and data in the cloud is generally less expensive than hosting systems on-premises because institutions do not need to pay physical maintenance and support costs.
- ▶ Institutions can reduce costs associated with application licenses and managing hardware or software even as they scale to accommodate more online learners.
- ▶ Using an open-source container-orchestration system such as Kubernetes can automate computer application deployment, scaling, and management.

Enhance Agility

- ▶ The cloud enables institutions to make changes on the fly or make updates to virtual infrastructure more efficiently than traditional environments.
- ▶ Institutions can automate much of the manual work that causes operational pains and downtime to improve productivity.
- ▶ Cloud computing provides on-demand scalability that enables institutions to make adjustments as their needs shift, student demands change, and new market opportunities arise.

Improve Engagement

- ▶ Cloud environments can reduce load times and enable more user-friendly experiences.
- ▶ The cloud makes it easier for faculty and staff to connect quickly with students. By rapidly deploying cloud-based solutions that suit learners' needs, instructors can monitor students' progress closely via online course access and offer personalized feedback.
- ▶ Institutions can monitor experiences and leverage user data from cloud environments for valuable insight that can enable more informed decision-making. Institutions can use this data to proactively engage with students and build more rewarding relationships.

Although the cloud is beginning to gain traction in higher education, the cloud is not new. Now, many applications are created specifically for the cloud. These applications, called cloud-native solutions, are different than conventional applications that can be moved to the cloud.



The reason we decided to move to the cloud was for management purposes. It did free up some resources for us, both personnel and financial...This allowed us to expand our breadth and depth and capacity and ability.

Chuck Sweet

President's Chief of Staff and Vice President for Operations
Southern California University of Health Services

Making Sense of the Jargon:

Cloud-Native vs. Cloud-Enabled/Ready

Cloud-enabled/ready software is a term used by enterprises for applications that can take advantage of the cloud. Typically, these types of applications are made on-premises in a static environment and are built to allow functionality in the cloud. This allows for somewhat monolithic applications to be launched from the cloud via a browser interface, whereas typically that application would need to be installed on the machine before running it.

On the other hand, cloud-native technologies consist of applications that exploit the advantages of the cloud computing delivery model. A cloud-native approach is about how applications are created and deployed, not where. Cloud-native software replaces monolithic applications by enabling more specific application functionality grounded in containers that use microservices and dynamic orchestration. Foundationally, cloud-native solutions are developed from the ground up so they can leverage technology in a way that a cloud-enabled environment cannot.

Cloud-Native Solutions Enable:

- ▶ **Continuous Integration/Continuous Delivery:** Continuous integration/continuous development (CI/CD) means that changes can be built, tested, and deployed within the system as they become available. This reduces downtime, the overhead needed in resource planning, and the time required for system maintenance.
- ▶ **Enhanced Elasticity for Scaling Up or Down:** Using automation, a cloud environment can scale up the system in response to increases in load and scale down in response to sustained drops in load. By scaling up, the system remains available and responsive. By scaling down, institutions can reduce costs.
- ▶ **Minimized Downtime:** There is greater redundancy in the cloud than there is on-premises. If a cloud provider suffers an outage, another region can pick up the slack. On-premises applications might have failover ready, but, typically, if the server goes down, the application goes down with it.



Cloud-native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private, and hybrid clouds. Containers, service meshes, microservices, immutable infrastructure, and declarative APIs exemplify this approach.

These techniques enable loosely coupled systems that are resilient, manageable, and observable. Combined with robust automation, they allow engineers to make high-impact changes frequently and predictably with minimal toil.

The Cloud Native Computing Foundation

DevOps is a culture and environment where building, testing and releasing software happens rapidly, frequently, and more consistently.

Microservices-oriented. Applications are segmented into microservices significantly increasing the overall agility and maintainability of applications.



Continuous Delivery enables the shipping small batches of software to production constantly, through automation.

Application and processes packaged and running in their own **dynamically orchestrated containers**, providing an **elastic** application which can grow or shrink resources dynamically as needed to adapt to workload changes automatically, maximizing the use of resources.



What are Microservices and How Can They Help My Institution?

Cloud-native applications are modular in nature, with many functions broken down into microservices, or loosely coupled services. This means that microservices can be shut off when not in use and that updates can be rolled out to a specific microservice, rather than the whole application. With a cloud-enabled application, the entire system can be affected when only a specific area is updated.

Each microservice has an autonomous lifecycle and can evolve independently and deploy frequently. In other words, there is no need to wait for a quarterly release to deploy a new feature or update; institutions can update a small area of a complex application with less risk of disrupting the entire system.

Each microservice can also scale independently. Instead of scaling the entire application as a single unit, institutions can scale up only those services that require more processing power or network bandwidth. This approach provides for greater control over the system and can reduce overall costs.

Microservices share the following characteristics:

- ▶ Each implements a specific business capability within a larger domain context.
- ▶ Each is developed autonomously and can be deployed independently.

Other Cloud Migration Considerations



As institutions develop their cloud strategies, it is important to keep these issues in mind:

- ▶ **What is the problem to be solved? How can the cloud help meet that objective?**
- ▶ **Are there functional, financial, practical, or other specific needs?**
- ▶ **Is high availability a priority? Is redundancy a must?**
- ▶ **Are there budgetary restrictions?**

The migration to the cloud is a complex transformation and cannot be done overnight. Many organizations find themselves overwhelmed by rapidly changing business demands and the need to retain proper IT talent. Keeping an IT environment running smoothly requires constant attention and highly skilled staff.

A managed services organization can free up institutions from necessary, time-consuming IT tasks like patching, monitoring, and managing IT infrastructure. Collaborating with an experienced managed services organization can simplify and even accelerate cloud transformation projects.

Conclusion

Moving to cloud-based services can help both students and the institution. The cloud enables unique digital business capabilities that can help institutions differentiate student and back-office user experiences. It can also provide a solid foundation for digital transformation strategies and set the stage for future innovation.

As the digital campus evolves and institutions are pressured to support more technology-driven environments and experiences, higher education will likely continue to reach for the clouds.

About Jenzabar

Created out of a passion for education and a vision for technology, Jenzabar offers disruptive, innovative software solutions and services that empower students' success and helps higher education institutions meet the demands of the modern student. Over 1,350 higher educational campuses harness Jenzabar solutions for improved performance across campus and a more personalized and connected experience for the student. For further information, please visit jenzabar.com or on [@Jenzabar](https://twitter.com/Jenzabar) or [LinkedIn](https://www.linkedin.com/company/jenzabar).

Jenzabar, Inc.
101 Huntington Avenue
Suite 2200
Boston, MA 02199, USA

Find out more

☎ 1.800.593.0028

✉ info@jenzabar.com

🌐 jenzabar.com

