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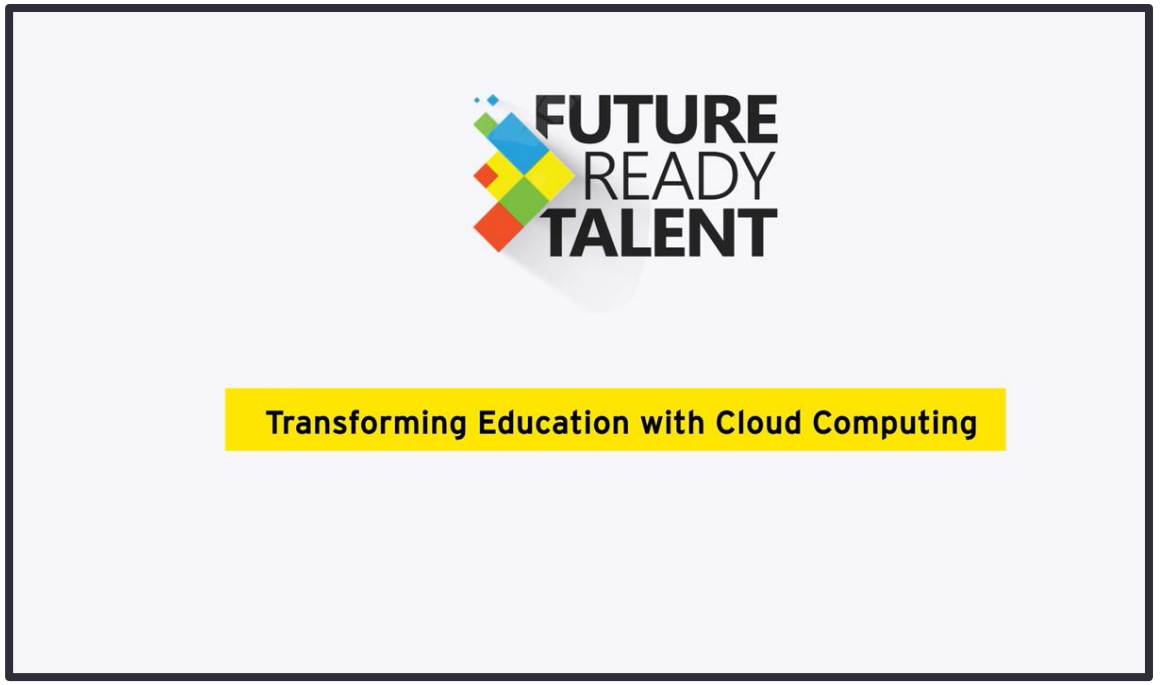
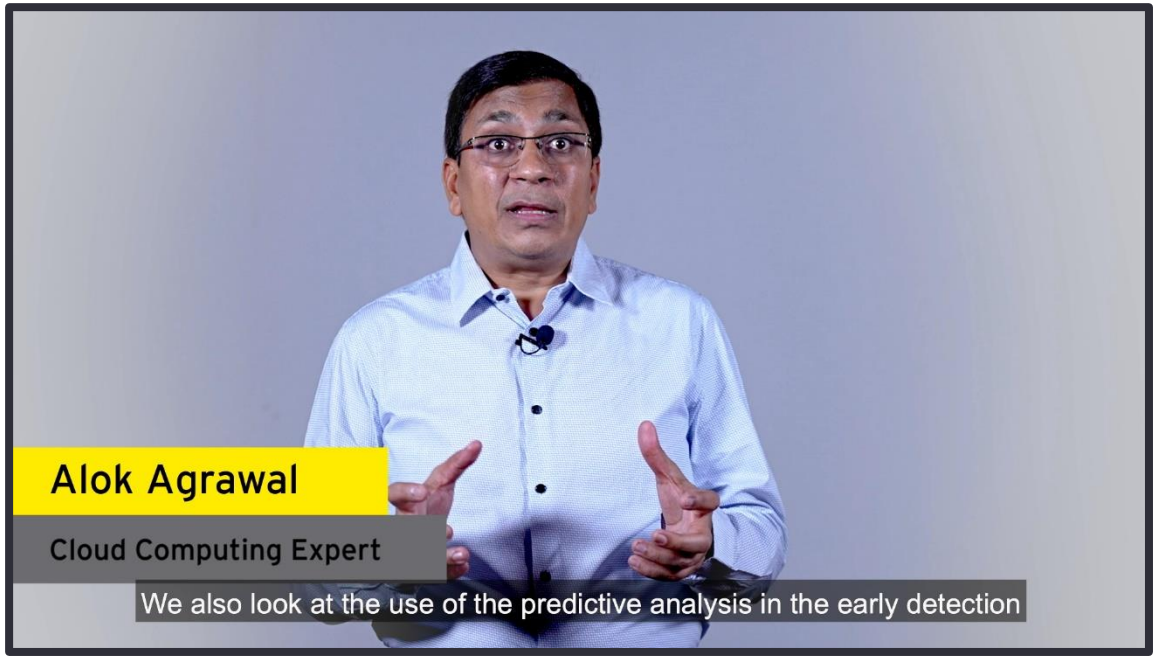
Transforming Education with Cloud Computing

Hi, In this discussion, we will look at how Microsoft Azure is enabling Education and bringing about digital transformation across Educational Institutions.



Transforming Education with Cloud Computing

Friends! Let us spend 30 minutes to appreciate how Microsoft Azure is providing the platform for lifelong learning.



Transforming Education with Cloud Computing

Timely and continuous learning will determine who wins in the 21st century.

The necessity to cope with the rapid changes in science and technology in the 21st century and the necessity to adjust to the prerequisites of the knowledge society have brought about the need for lifelong learning.

The positive outcome of the PANDEMIC is that “Online Learning” is the new norm; and the need for it is growing at unpredicted pace.

Transforming Education with Cloud Computing

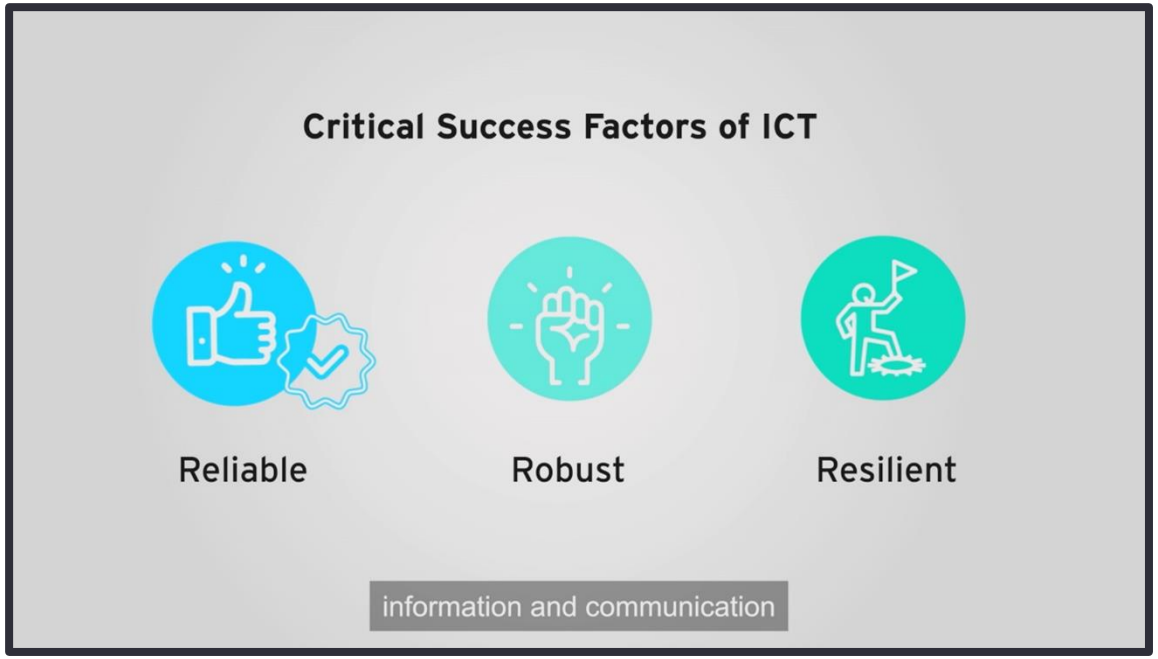
To name a few, B.I.TS Pilani [Work Integrated Learning Programs], Coursera, eDX, National Program on Technology Enhanced Learning offer multitude of programs [certificate level; undergrad; postgrad] at an affordable price.

These opportunities pose multiple challenges to the educational institutions.

Transforming Education with Cloud Computing

Challenges faced by Educational Institutions

Online learning succeeds on the foundation of a Reliable, Robust and Resilient ICT [Information and Communication Technology Infrastructure]



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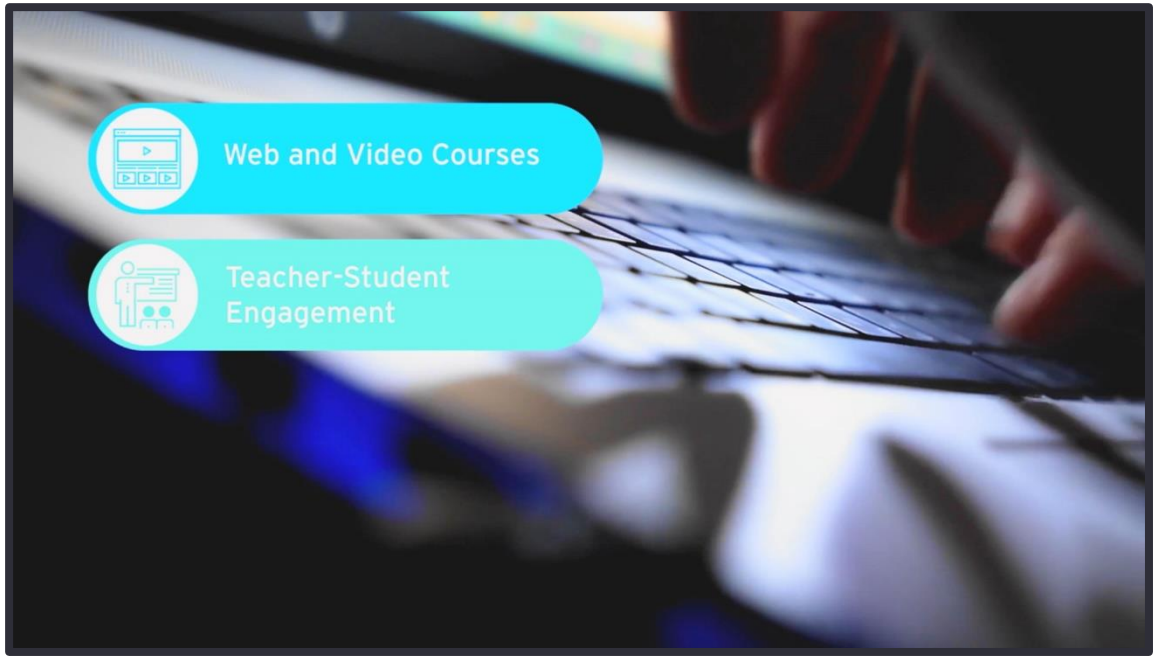
In addition, there is a need to host learning content of web and video courses and teacher – student engagement, by way of discussion forums and lots more and to securing student information for a mandated period of time [typically 5 years]



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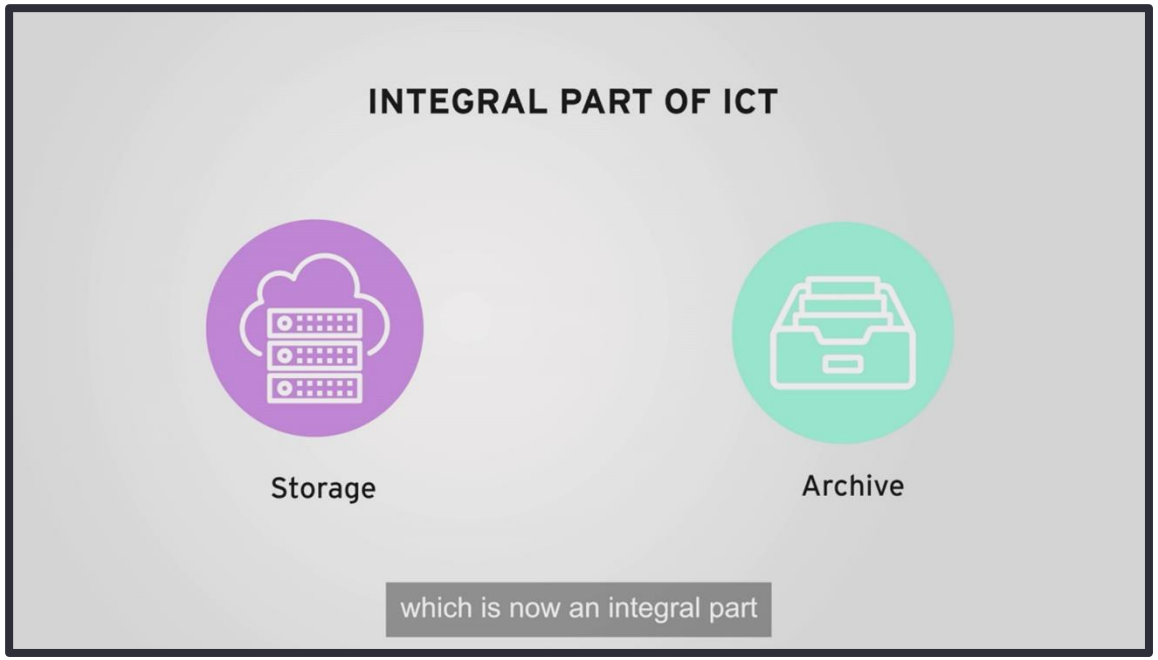
Thus, information storage and archival is an integral part of ICT infrastructure



Transforming Education with Cloud Computing

Furthermore, Institutions are also looking at the use of the predictive analytics by which educators will be able to guide the students on the able to understand the areas they have “aced” and where they “lag” behind.

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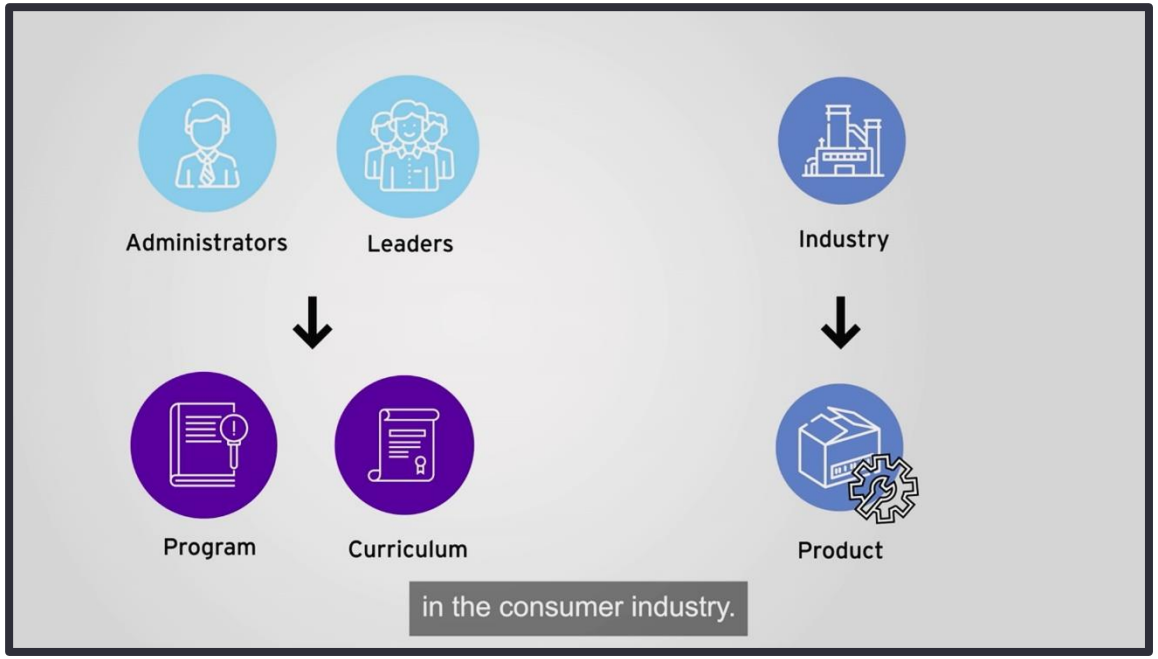
They analyze the course performance against ROI, KPIs, and other metrics to improve performance.



Transforming Education with Cloud Computing

They leverage a range of qualitative (user discovery research, focus groups, usability studies, etc.) and quantitative (surveys, analytics, market research, etc.) data into "particular course's requirements.

These are being built on Microsoft Azure and Power Platform.

Transforming Education with Cloud Computing

Friends! Let us now get an overview of how Microsoft Azure has transformed education.

Transforming Education with Cloud Computing

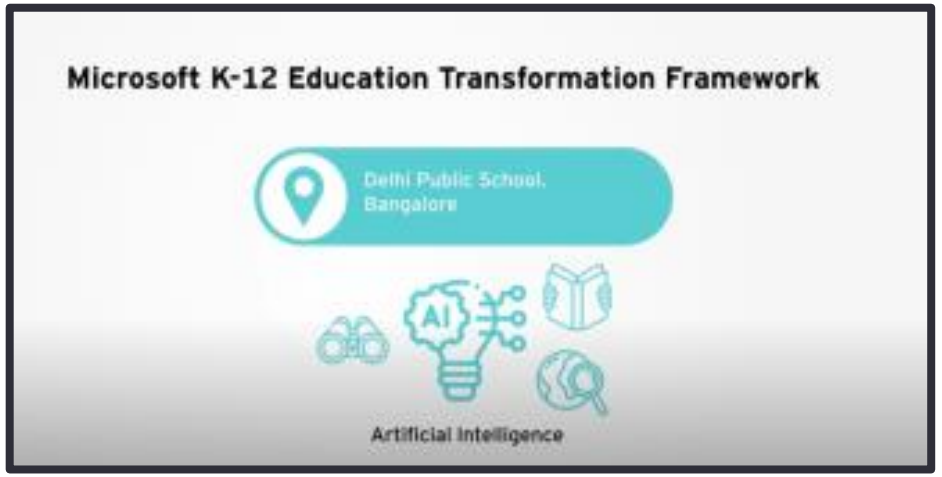
Let's see how Microsoft K-12 Education Transformation Framework is helping to create innovative solutions.

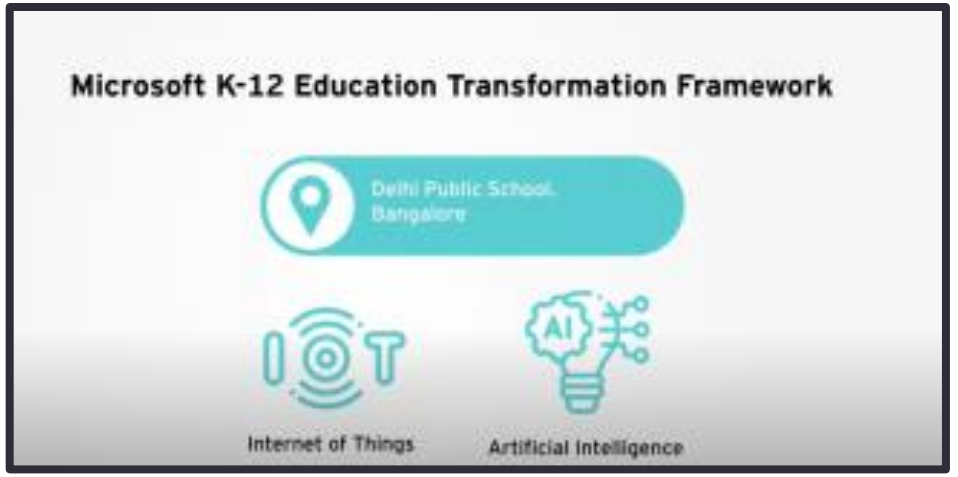
Transforming Education with Cloud Computing

Delhi Public School, Bangalore developed innovative solutions for problems such as environmental issues and sustainable living MineCraft as well as IoT and AI.

Hansraj Model School, Delhi built a bot using Microsoft's AI powered technologies.

Suncity School, Delhi are facilitating tutoring amongst students to learn the basics of programming for coding using Microsoft Azure Insights and other tools.





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DeVry University used Azure Labs to unify Online and Onsite class experience: Differences in course models presented a unique challenge; how could they streamline learning environments for its students, both in person (onsite) and online.

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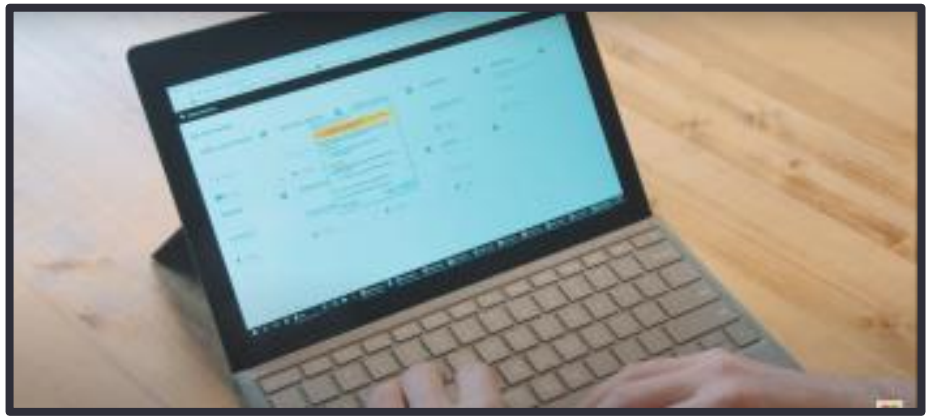
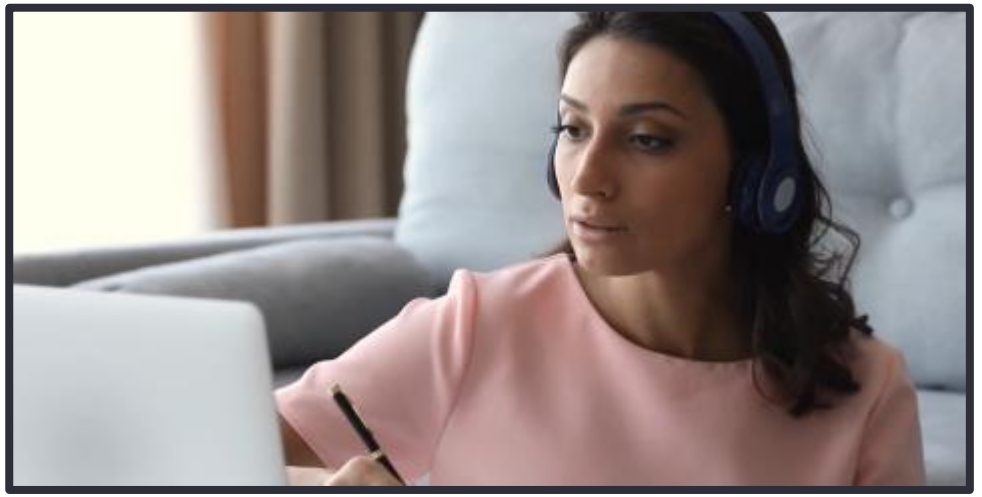
DeVry wanted students to have access to platforms and software that operated within the same environments they would encounter in their post-graduation careers.

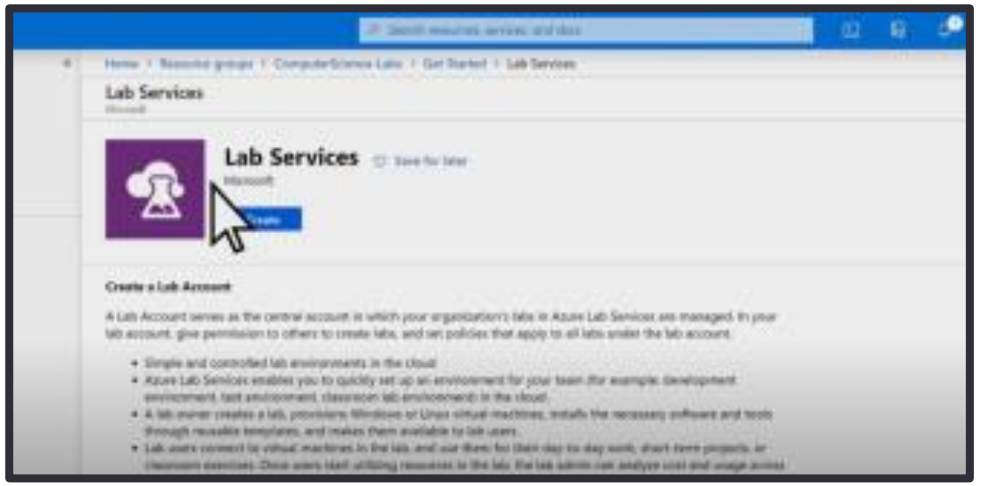


Transforming Education with Cloud Computing

Azure is taking over by simplification greater depth and breadth....

What is mainly happening in DeVry university is that students are able to download the applications in a manner such that they are scattered to their individual educational goals with Azure lab services which is actually providing far far better learning environment than what I have mentioned to you in just brief two or three sentences.





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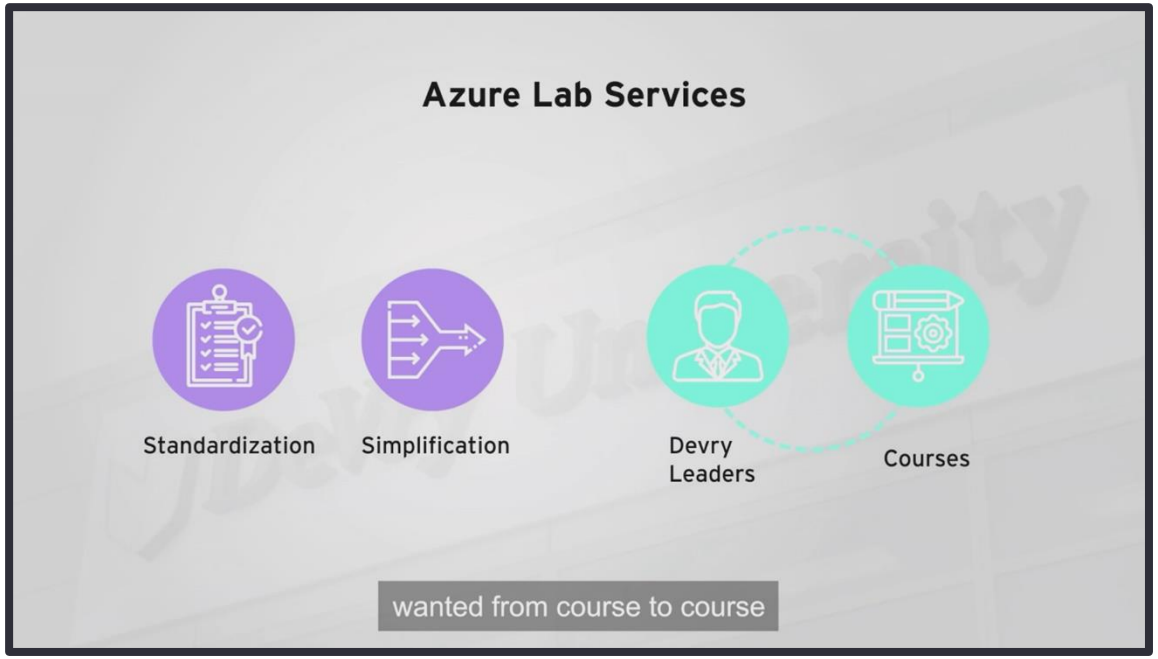
Let us appreciate Microsoft Azure lab services, which has predominantly introduced standardization and simplification that the leaders of DeVry University wanted from course to course.



Transforming Education with Cloud Computing

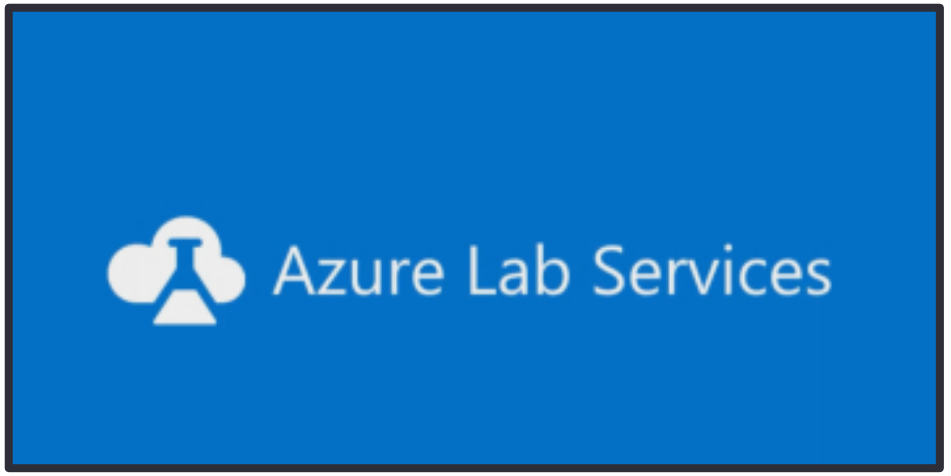
Using Azure labs, the faculty members not only managed their systems on their own but they creatively develop their curriculum and the end result is they take ownership of the course. Their needs to be a relationship between a student and a faculty.

And this relationship unlike the Gurukul days you know has now become very flexible and the faculty needs to be providing different learning paths to the students so that they are engaged. Today with systems like adaptive learning and personal (8.07 CHECK) learning students can depend on the educators to guide them on a right content to learn the concepts and apply them contextually.

Transforming Education with Cloud Computing

DeVry University had already taken the lead in adapting office 365, Azure SQL and visual studio.

Therefore, Azure lab services together with the three which I just mentioned, DeVry was able to use existing platforms to create a unified learning solution for the students and faculty which is very important in today's learning environment.



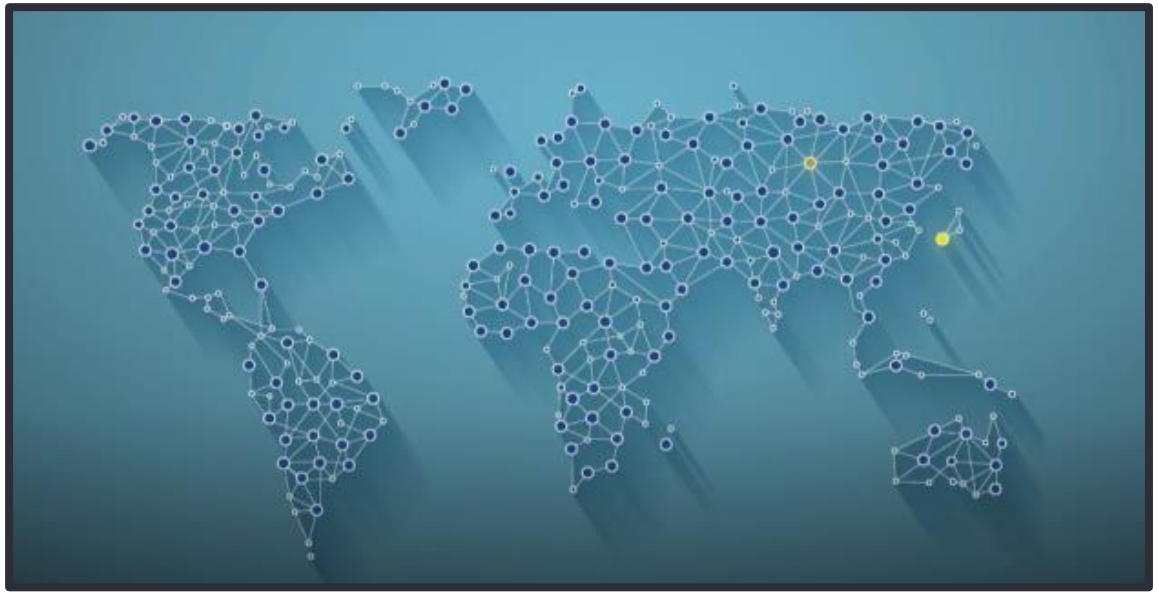
Transforming Education with Cloud Computing

Azure lab Service could be deployed the following scenarios:

- Professional training or school classes
- Hackathons
- Hands-on labs
- Environments for demo
- Machines for development and test environments.

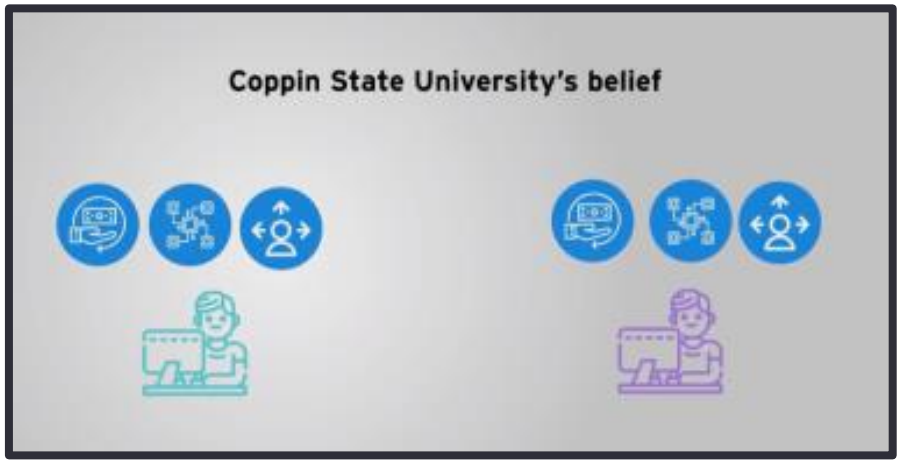
Transforming Education with Cloud Computing

Hundreds of universities across the world which are leveraging Microsoft Azure to its highest potential.



Transforming Education with Cloud Computing

Coppin State University believes that each student's educational experience is going to be unique and that some may need more financial, technological, and career-guidance support than others.



Transforming Education with Cloud Computing

Integrated platform leveraging Microsoft Azure, Office 365, and Dynamics 365 provided a modular solution.

Transforming Education with Cloud Computing

The power of Microsoft Dynamics was modular wise; and one such module name was REACH Module.

Reach module within Microsoft dynamics it provided personalize messages at a deeper and exciting level.

Students started getting the sense that the education institution is on same page as them and guiding them telling them and hand holding them to take action at important points and you know radar guiding them through the admission process.

Transforming Education with Cloud Computing

This apart, Microsoft 365 platform is offering student how they can realize the target are or they need to change that area.

Many times we want to pursue a particular career and at some point in time we realize it's not for us. In case, there is a connect between the university and the industry, this constraint could be overcome

With Consultancy coming from the business or industry, the curriculums can be tailored to fit the in demand careers.

Transforming Education with Cloud Computing

There is another enterprise - organization which is based out of United States and got a significant presence in India South East Asia Middle East and of course the United States its home country.

The biggest challenge that they face is IT infrastructure availability and reliability was a barrier. What exactly did they do, they invested and even disinvested.

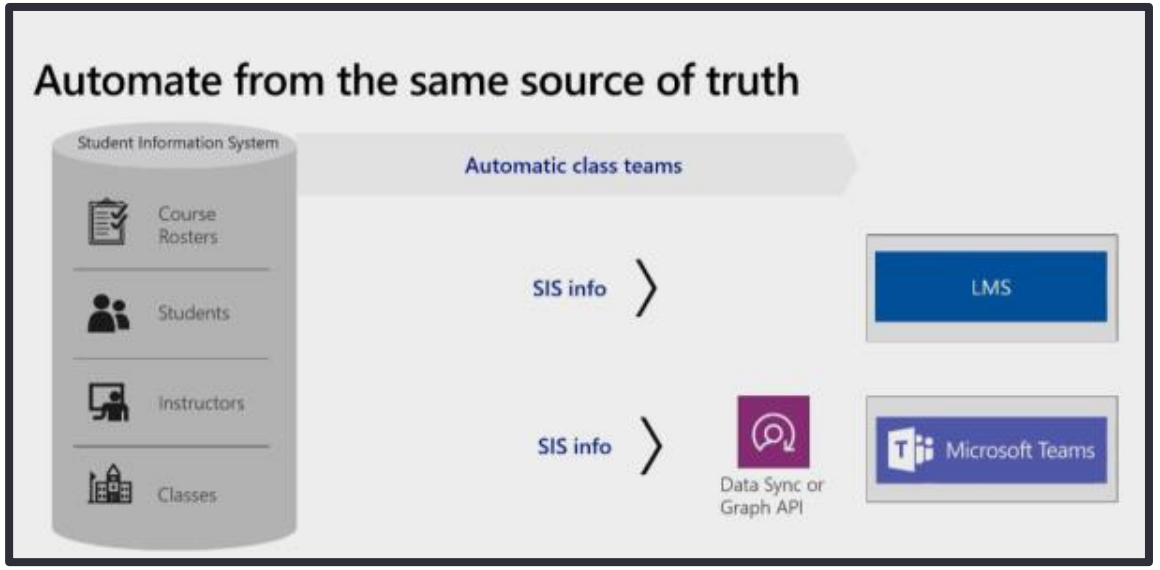
They disinvested from having on premise complete infrastructure and invested on the cloud and in the bargain they implemented a learning management system.

Transforming Education with Cloud Computing

This particular institution adopted a spectrum of Azure services - Platform as a service.

As a platform it offers wide spectrum of tools, utilities and can be catered to [Azure DNS, Azure SQL and web applications etc.] and gives more than what a off the shelf LMS does

There is a need to store large amount of data so we have Microsoft on cloud storage provided by Blob storage, Azure Files and there is an environment of storage management built around it and the architecture is limitlessly scalable.



Transforming Education with Cloud Computing

To summarize....

We have seen how educational institutions can benefit from Microsoft office (called office 365 in one of its variant), Azure platform which is broad, deep and we have to pick-up what exactly do we require from the huge menu that it offers.

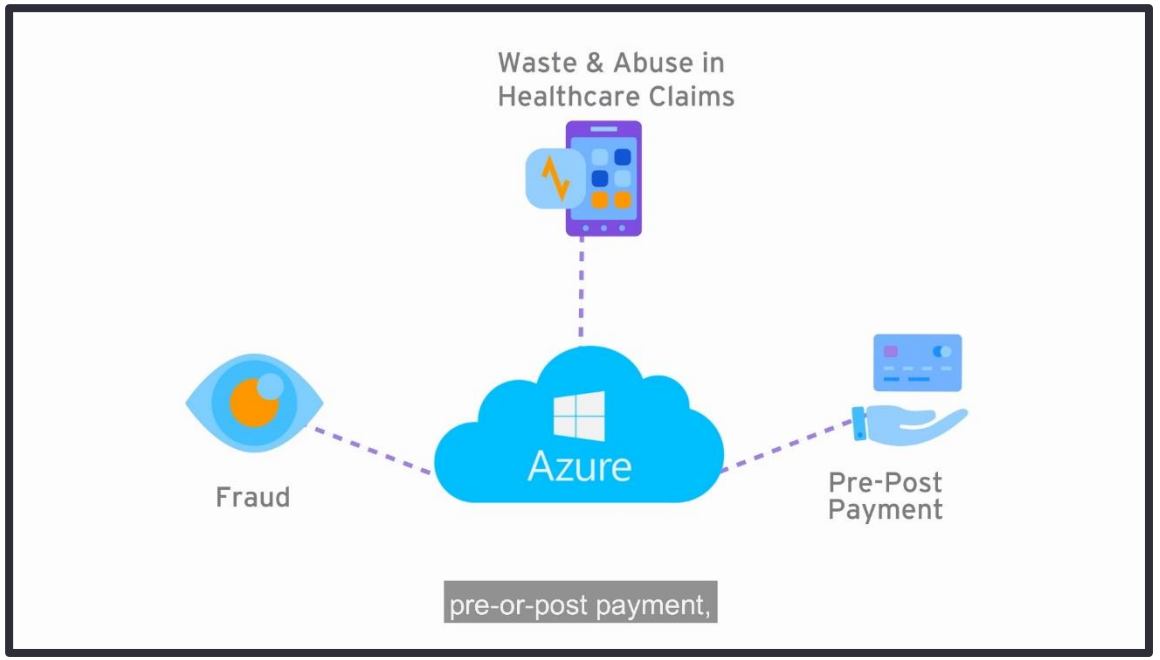
Transforming Education with Cloud Computing

Case Study – Leiden University

Students at Leiden University used terabytes of data generated to train a Neural Networks for identifying known asteroids that match the trajectories of simulated asteroids that pose potential danger for Earth.

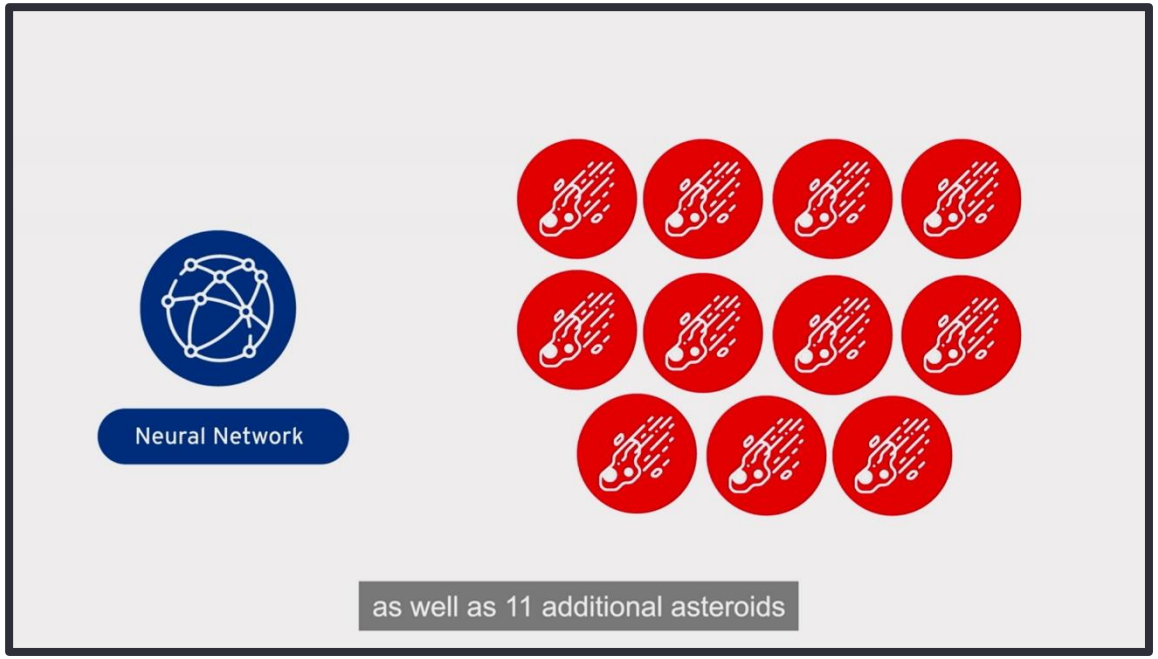
Transforming Education with Cloud Computing

One more example let us take from the insurance claims - CGI federal incorporate, a leading insurance claim settling company applied Azure Cloud Platform to reduce fraud, waste & abuse in healthcare claims, pre-or-post payment, with comprehensive Azure Cognitive Services using Microsoft AI-ML algorithms.



Transforming Education with Cloud Computing

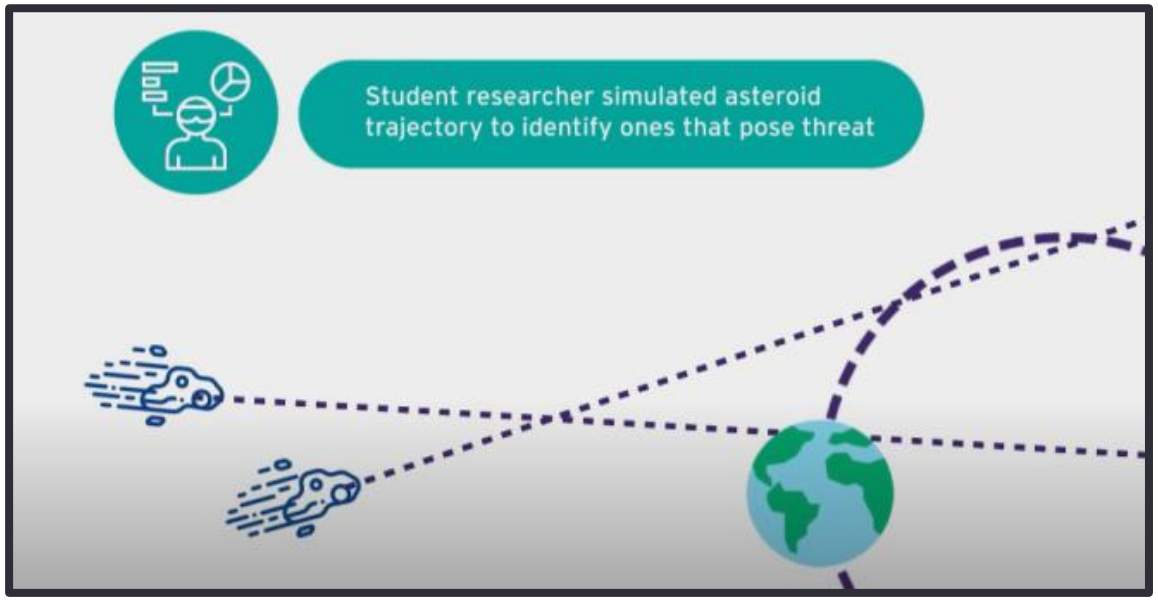
Neural networks identified most asteroids already classified by NASA as dangerous, as well as 11 additional asteroids that pose some considerable risk of impacting Earth.



Transforming Education with Cloud Computing

The quest to identify asteroids that pose a potential danger for planet Earth is no longer science fiction. It is scientific fact.

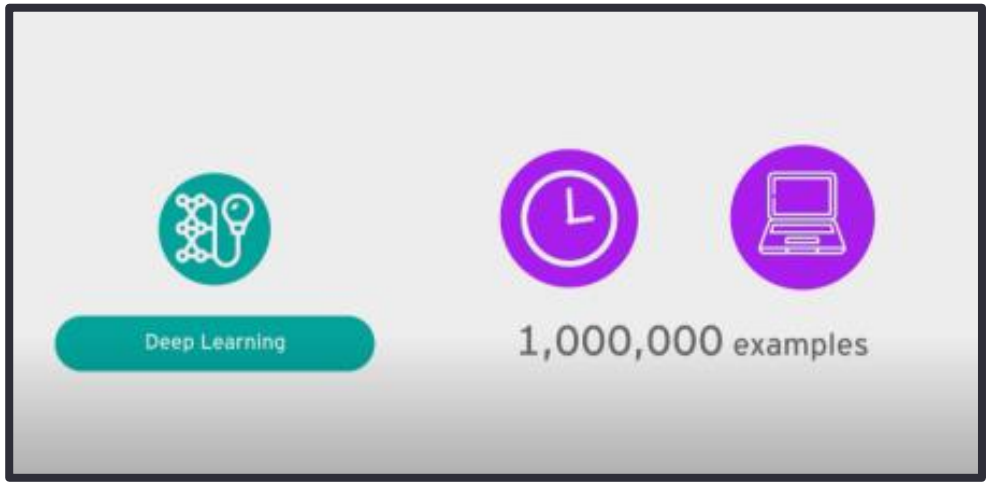
A recent student researcher was able to shed more light on the process by simulating the trajectories of millions of asteroids to help identify those that have a high probability of hitting Earth– sometime in the next thousand years.



Transforming Education with Cloud Computing

Researchers used deep learning to determine which asteroids could potentially hit Earth, ran simulations using the Python-based framework, which is designed to run on Linux.

They created around a million examples, which would take a tremendous amount of time on the laptop or even on a supercomputer.



Transforming Education with Cloud Computing

Hence, Cloud computing seemed like it had a lot of potential for this research, they discovered **Microsoft Azure Batch can run batch and high-performance computing (HPC)** applications in the cloud, scaling from tens to thousands of virtual machines.

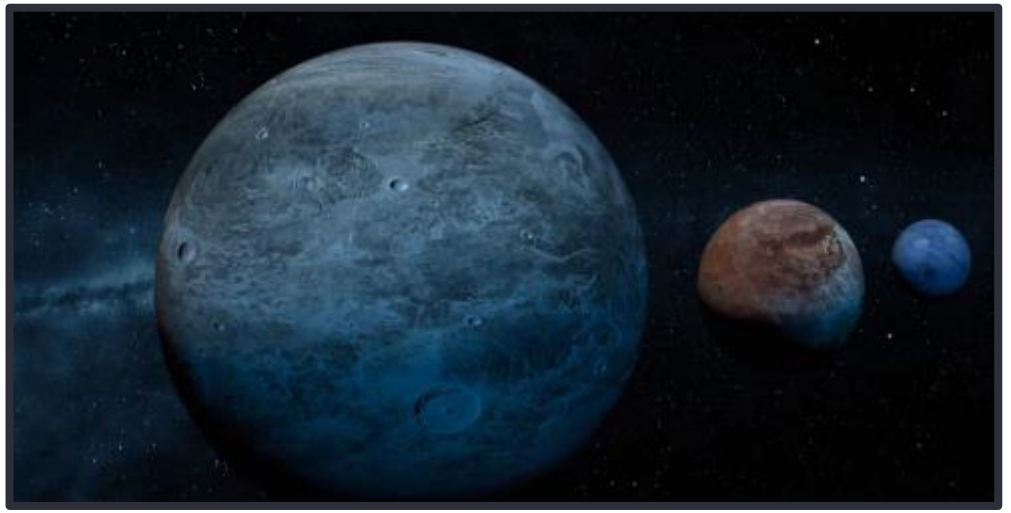
Batch is especially useful for running thousands of parallel operations, which made it ideal for the student's asteroid trajectory calculations.

Transforming Education with Cloud Computing

Generating a million simulations for $150 it is estimated that there are approximately 850,000 known asteroids in our solar system and potentially millions more, so need was to generate up to a million simulated asteroids.

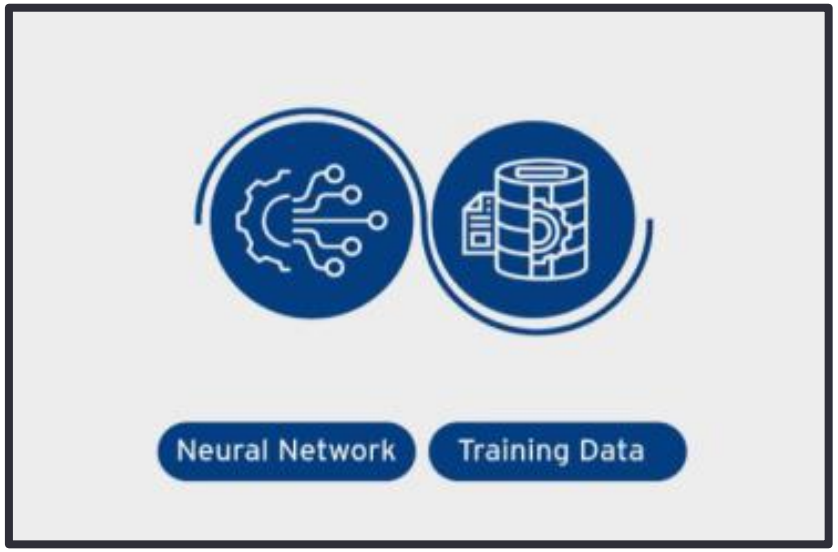
For a Neural network to work really well, you need a lot of training data.

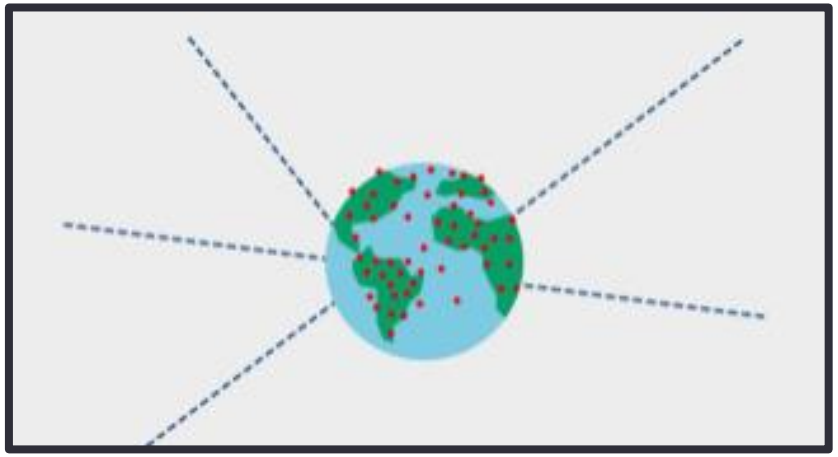
The simulated asteroids are launched from hundreds of thousands of points on the Earth's surface and then reversed so that they can be tracked on the journey back down.



Transforming Education with Cloud Computing

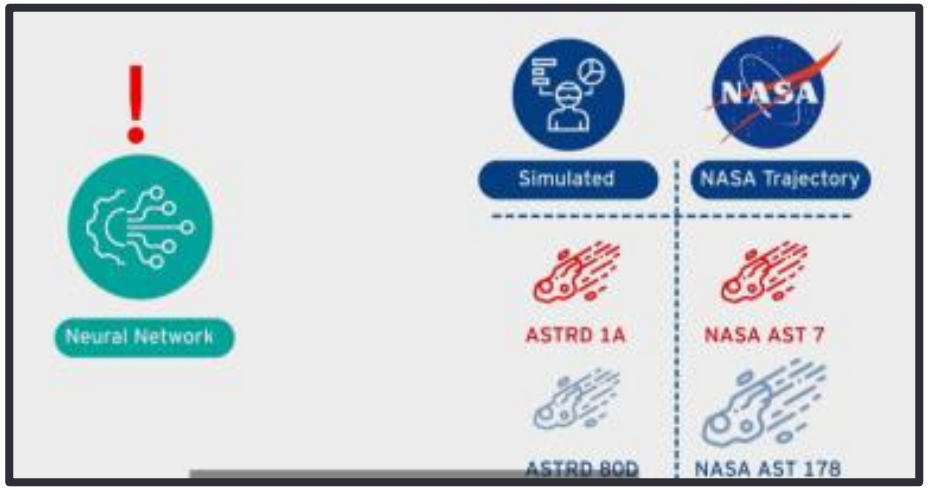
These simulated trajectories are stored in **Microsoft Azure Storage** and then fed into a **Neural Network**

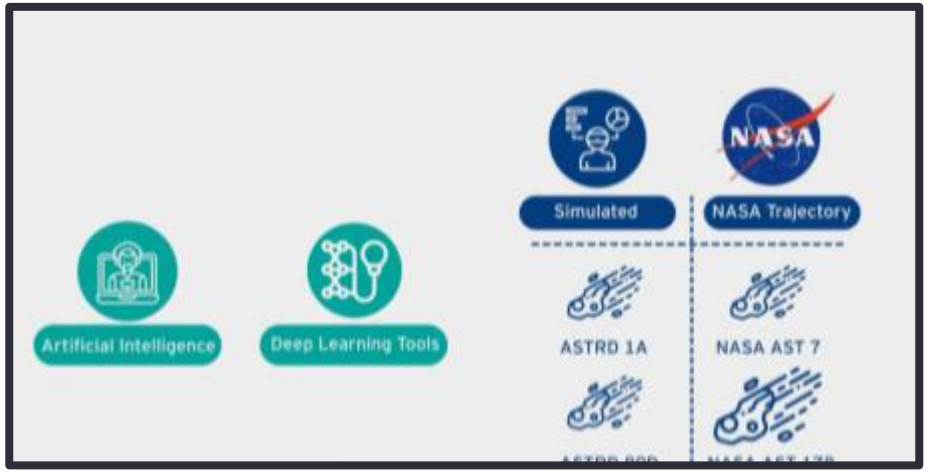




Transforming Education with Cloud Computing

Artificial intelligence (AI) and deep learning tools were used to compare the simulated trajectories to the trajectories of known asteroids in the NASA database to train the Neural Network to identify those that are potentially dangerous.



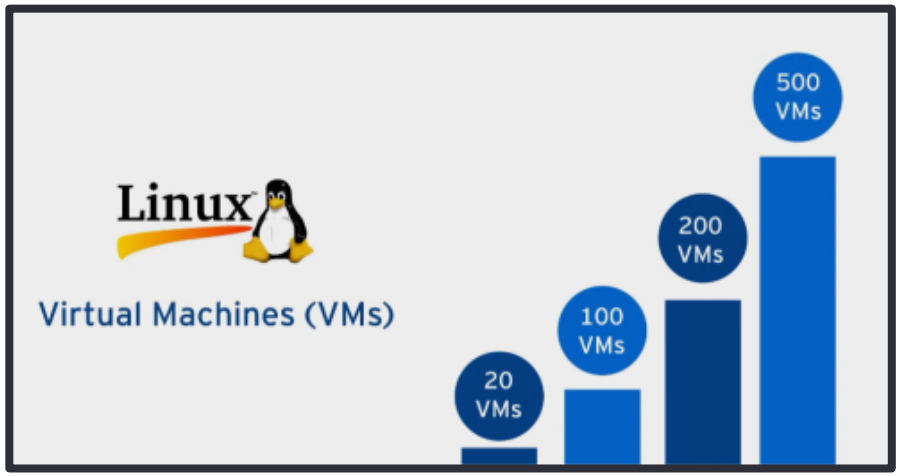


Transforming Education with Cloud Computing

They ran first batch of simulations on 20 Linux VMs in Azure and then scaled up to 100, 200, and ultimately 500 VMs.

The estimate is it took only about 15 minutes to spin up 200 machines, which generated a million asteroid trajectories in about nine hours, at a cost of only $150.

The time-savings also contributes to the low cost.



Transforming Education with Cloud Computing

The cost model of the virtual machines was on a model of “Pay per Use” only while they were running computations.

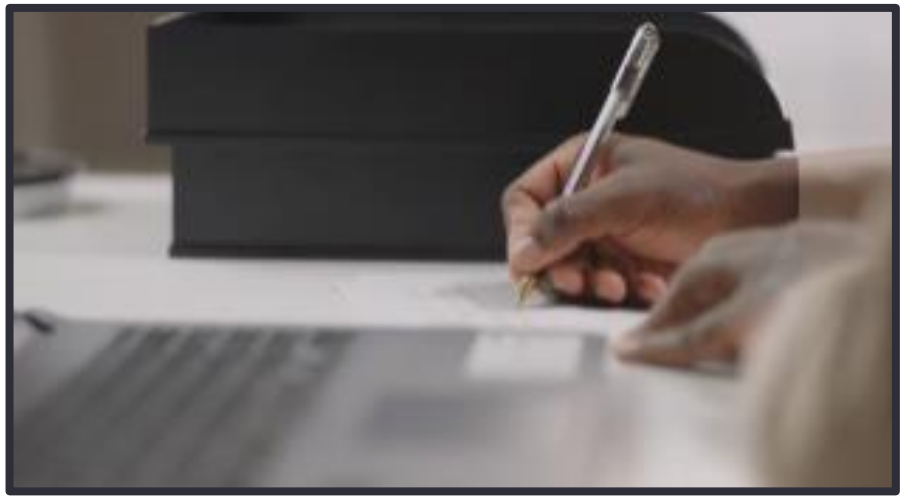
While some educational institutes provide unlimited access to the supercomputer, but this results in “Users Requests get Queued” With the cloud, you’re never in a queue.

You can spin virtual machines [VM] in Azure whenever and wherever you want. The ability to detect potentially dangerous asteroids as much as 100 years ahead of time can literally change the course of history. It gives scientists more time to respond, as, they have more options for trying to slow down or adjust the asteroids’ trajectories to steer clear of Earth.

Transforming Education with Cloud Computing

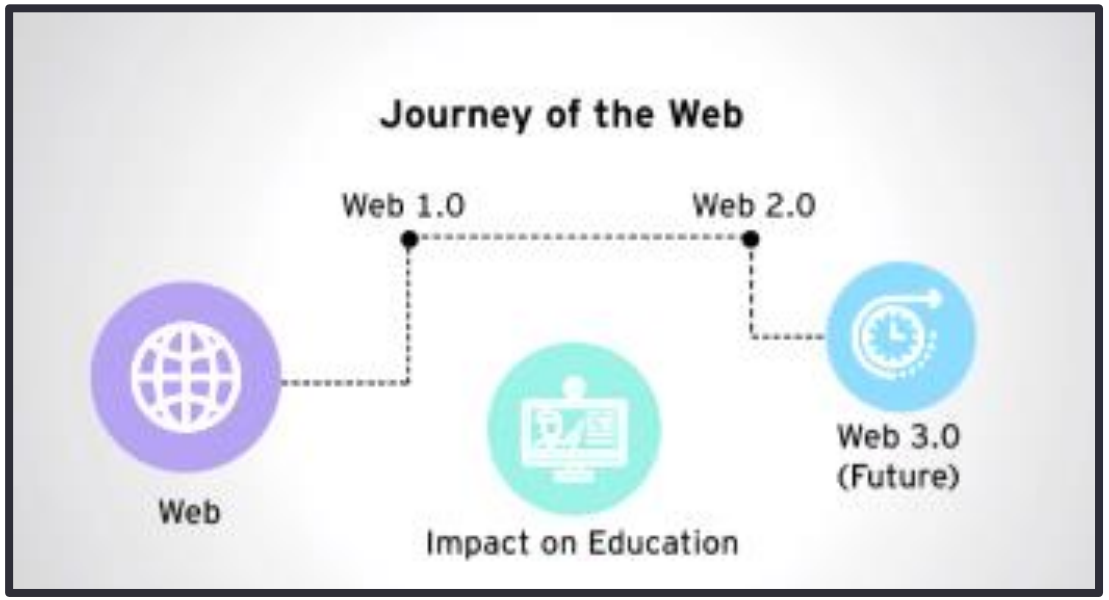
Key Takeaways

The World Wide Web has transformed in many ways how the industries function today and we lead our lives. Similarly, web has also played an extremely important role in transforming our educational system.



Transforming Education with Cloud Computing

Let's quickly take a look at the journey of the web and its impact on education.

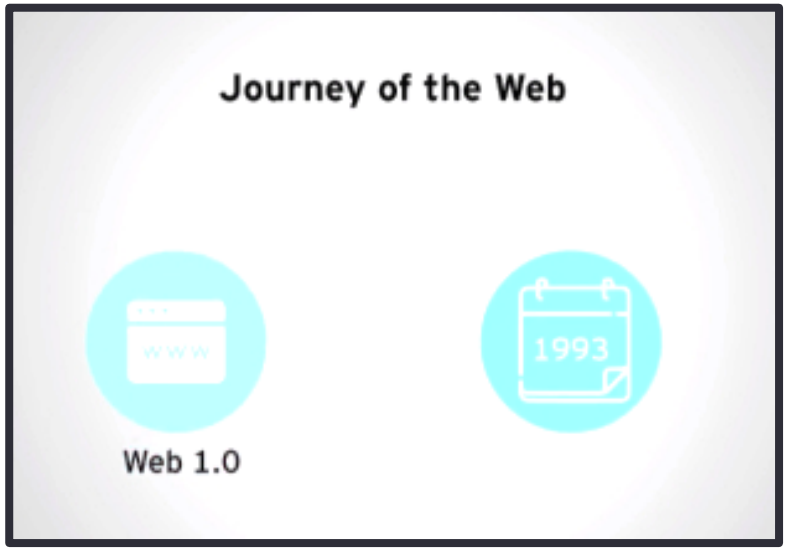


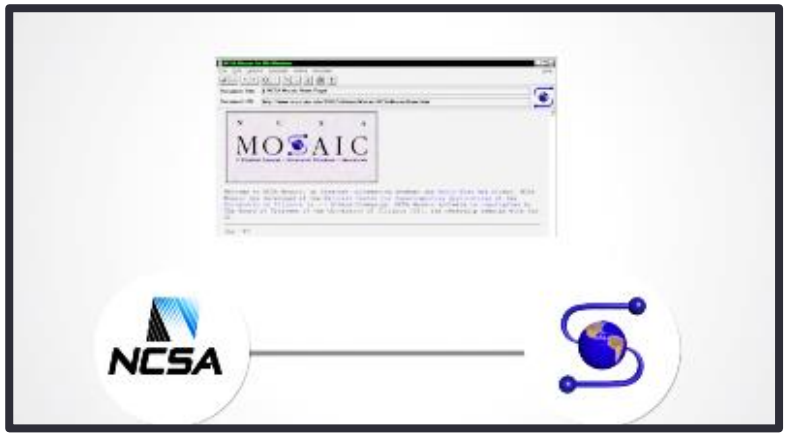
Transforming Education with Cloud Computing

Web 1.0 (1993 to early 2005)

In 1993, the National center for Supercomputing Applications (NCSA) released MOSAIC, the first web browser and progenitor of the Internet.

As the 1990s progressed, the Internet quickly gained traction.





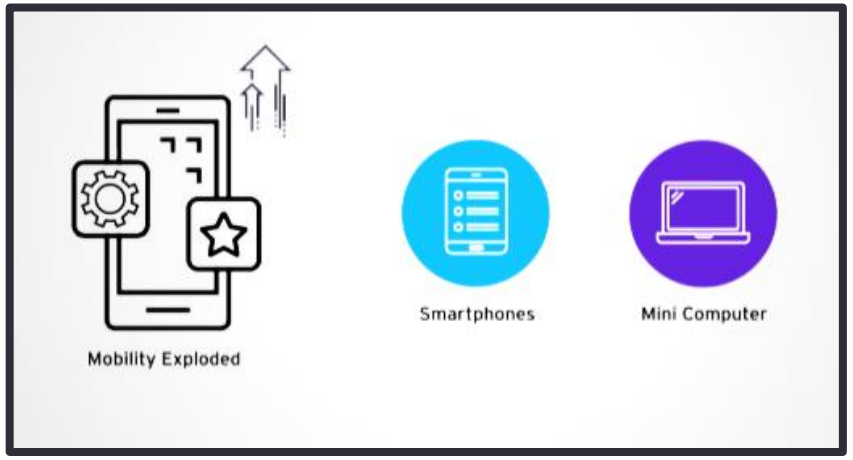
Transforming Education with Cloud Computing

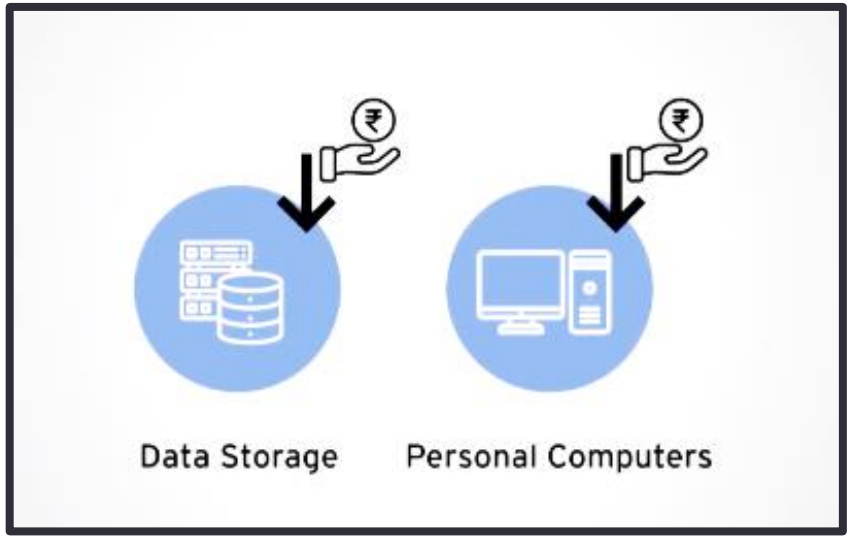
Web 2.0 (Mid - 2005 to present)

Mid 2000s saw a new breed of web services begin to take root – some of which have enabled the "Age of the Platform".

During the past decade we have seen many revolutionary changes – Rise of the platform is one of them. Data storage and personal computers have dropped in price; and continue to do. Mobility has exploded and smart phones are at least as good as portable mini computers.

Regardless of when this started maturing, today, we are firmly in the second iteration of the web.

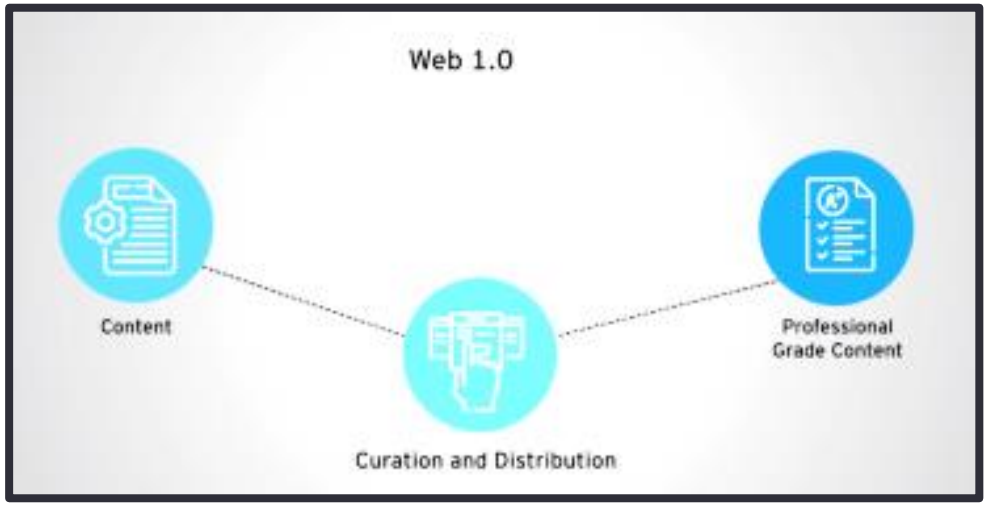


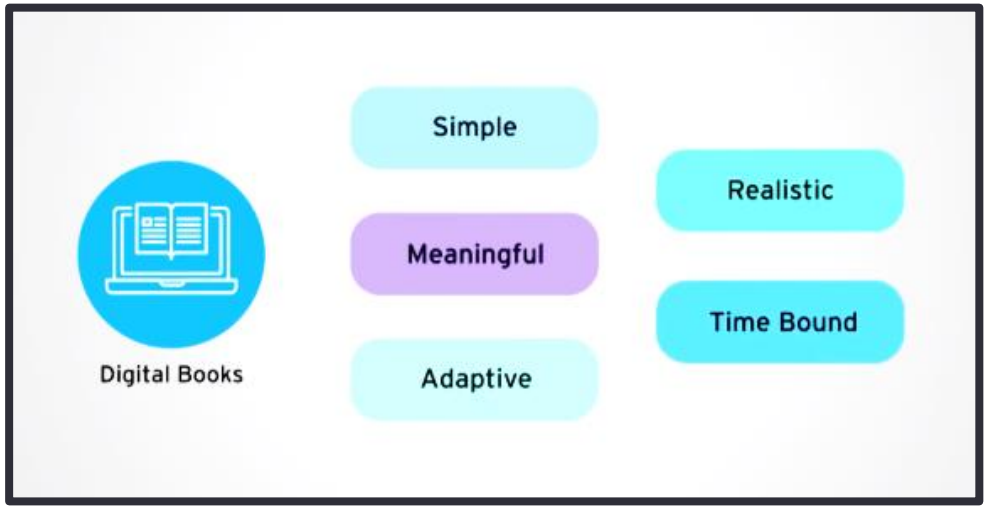


Transforming Education with Cloud Computing

While Web 1.0 allowed us to view content, with advent of Web 2.0 curation and distribution of professional grade content has provided the impetus for "learning content" to be tailored to the learning styles of the individuals.

Creating digital books and making them available across geographies is a Simple, Meaningful, Adaptive, Realistic and time bound for Massive Open Online Courses.

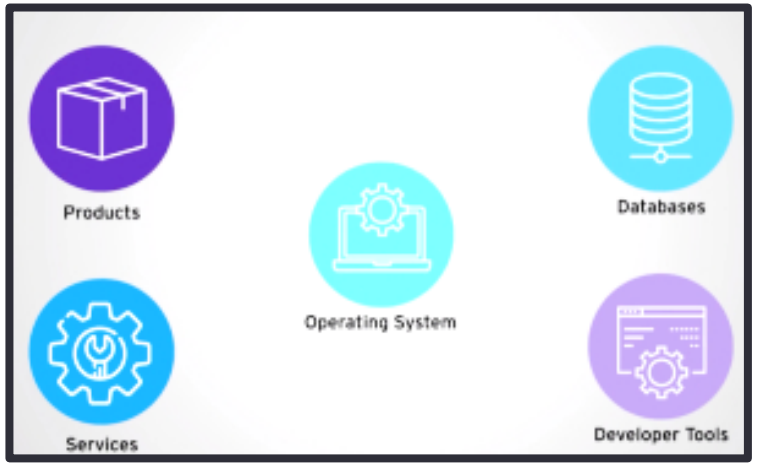




Transforming Education with Cloud Computing

Cloud platforms play a major role providing this content, Microsoft Azure offers software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS).

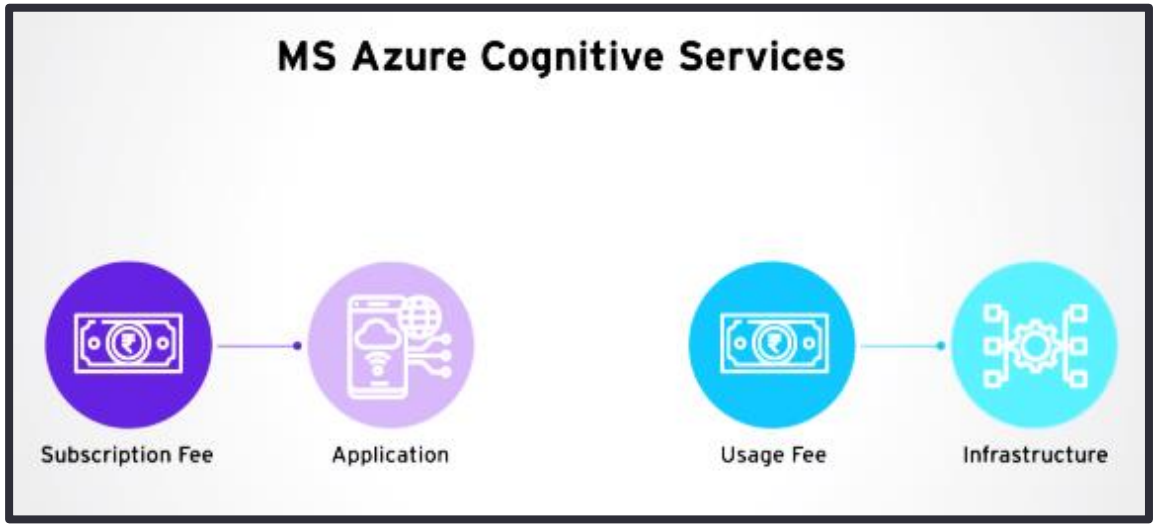
It offers hundreds of products, services and supports varied operating systems, databases, and developer tools.



Transforming Education with Cloud Computing

In addition to the services that Microsoft offers through the Azure portal, a number of third-party vendors also make software directly available through Azure.

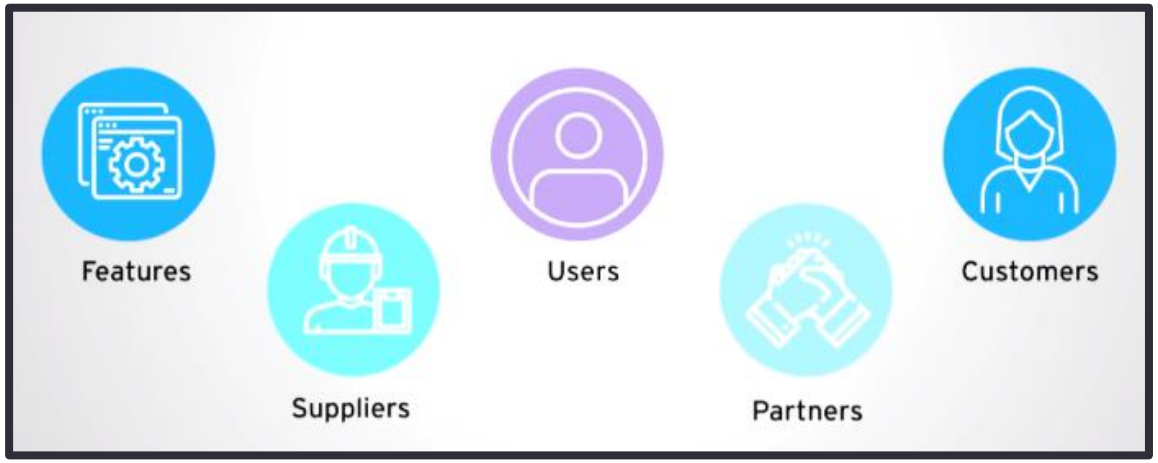
The cost billed for third-party applications varies widely but may involve paying a subscription fee for the application, plus a usage fee for the infrastructure used to host the application.



Transforming Education with Cloud Computing

Microsoft Azure is an extremely valuable and powerful ecosystem that quickly and easily scales, morphs and incorporates new features, users, customers, suppliers and partners.

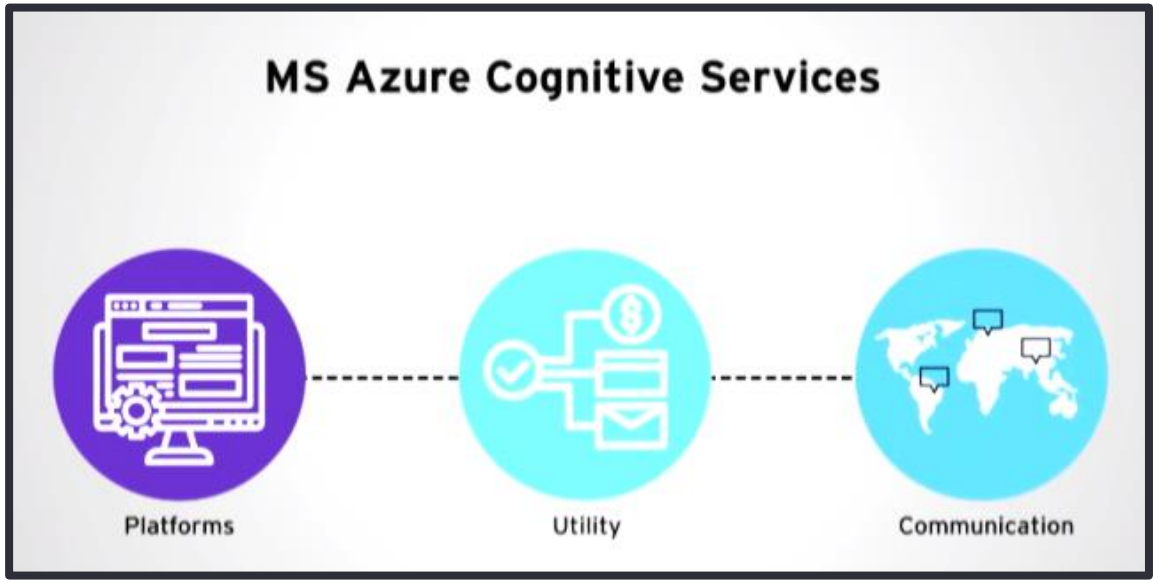
Today it is rooted in powerful technology – and its diligent usage.



Transforming Education with Cloud Computing

Even though a great deal of potential commercial appeal and applications inherently reside, platforms do not simply exist as a means for organizations to hawk their wares.

At the core, platforms today are primarily about consumer utility and communications

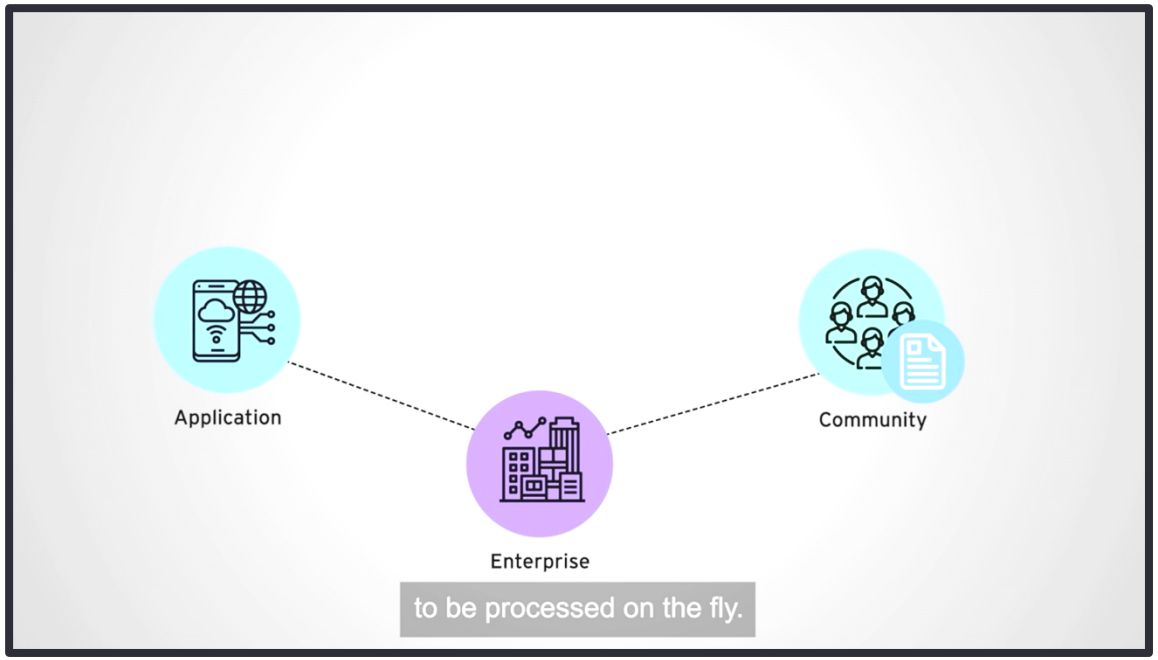


Transforming Education with Cloud Computing

Looking ahead [Web 3.0]

Over the next decade the web will become vastly more powerful, efficient and effective - stated , as “SEMANTIC”.

The vision of the semantic web is to extend principles of the Web from documents to data through a common framework that allows data to be shared and reused across application, enterprise and community boundaries to be processed on the “fly” – both by tools, as well as, human inputs – to unearth possible new relationships amongst silos of data.



Transforming Education with Cloud Computing

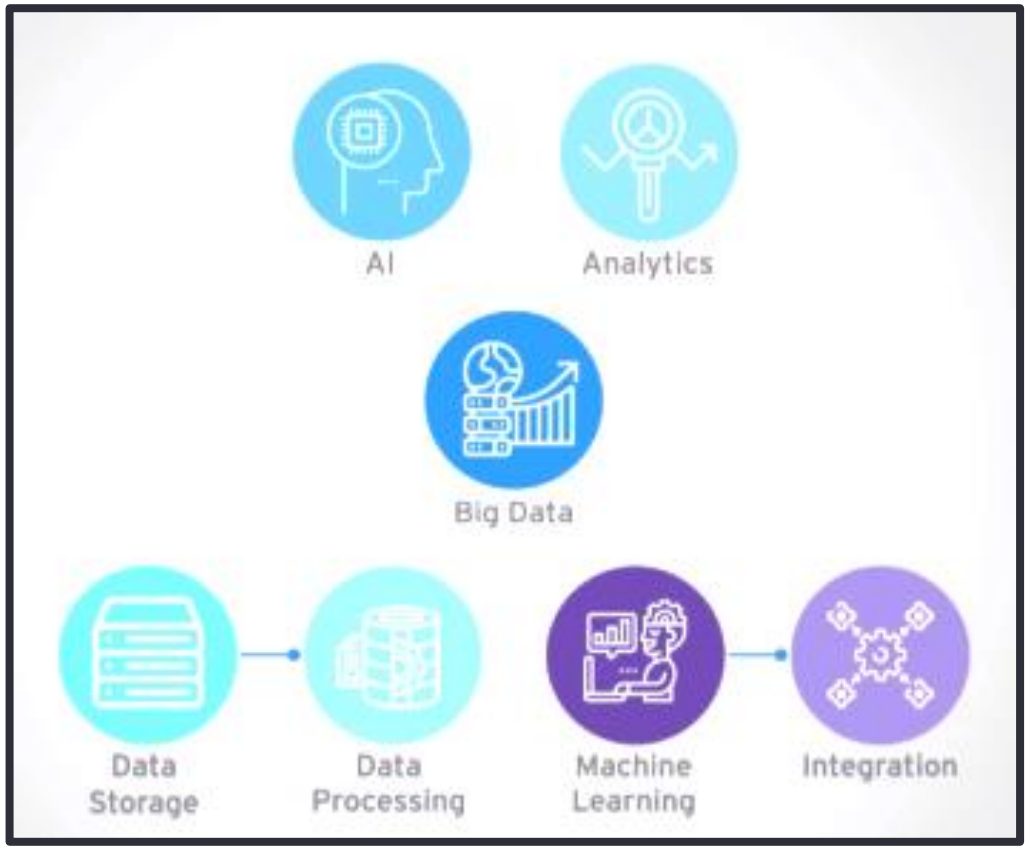
The "age of the platform is just the beginning...they increase the probability of future success, minimize risk, spur innovation and reduce time to market.

All else being equal, companies that embrace platforms will continue to do better than cling to blue prints.

Transforming Education with Cloud Computing

Azure cloud emphasizes AI and analytics services in its offering; provides a range of services that help in setting up a big data infrastructure, from databases, to data processing and analytics, to machine learning and integration of complex data sources.

Close to 100 Universities across the globe are leveraging the Azure Platform.



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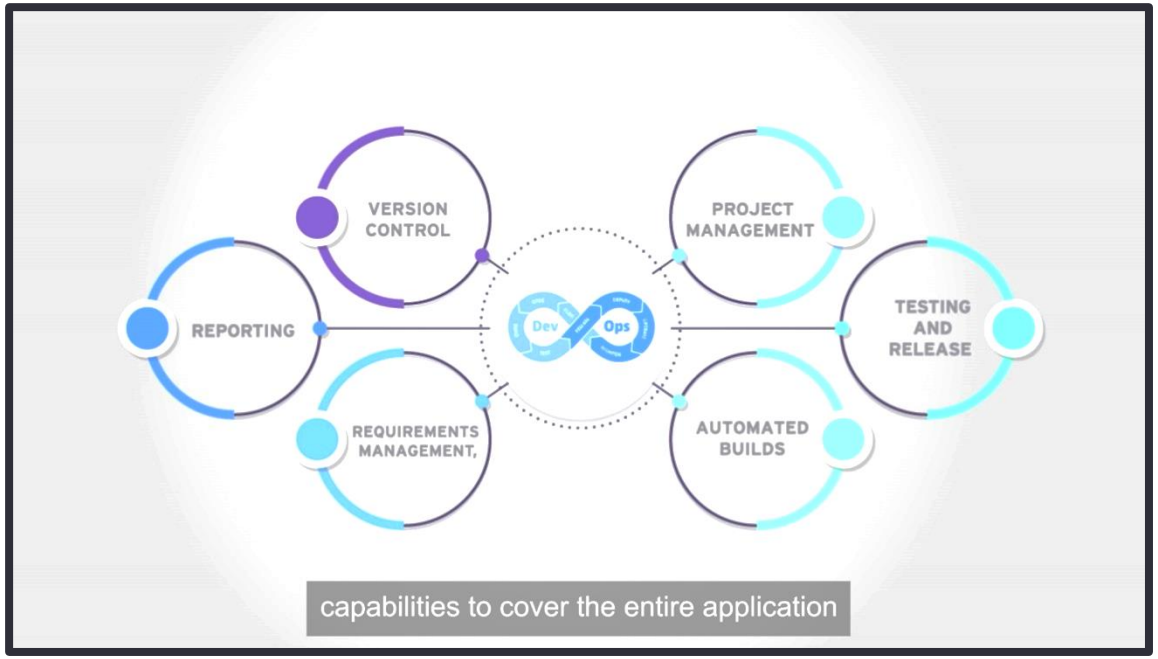
Azure Cloud platform offers greater efficiencies for business by its inherent high score of 3Rs [Reliability, Robustness and Resilience]; thus it provides provide a significant risk reduction for businesses without investing in backup datacenters in other locations, within the country or globally. Businesses can align their technology consumption with their technology needs and peak load requirement in short bursts, because Azure cloud offers very high scalability. It also allows businesses to implement technology in matter of hours, thus reducing their time drastically to automate their process of testing or the process of launching the product.

Transforming Education with Cloud Computing

Azure DevOps provides capabilities like version control, reporting, requirements management, project management, automated builds, and testing and release management capabilities to cover the entire application lifecycle, and enables DevOps capabilities.



Transforming Education with Cloud Computing

Azure Big Data emphasizes AI and analytics services provides a range of services that help in setting up a big data infrastructure, from databases, to data processing and analytics, to machine learning and integration of complex data sources.

Big Data infrastructure from the databases

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