PROJECT UNICORN

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ACHIEVING DATA INTEROPERABILITY THROUGH THE CLOUD

Whoever told you to get your head out of the clouds was...

WRONG!

Now, more than ever, **K12 school systems are expected to provide students and educators with seamless learning experiences powered by data interoperability**, even while working remotely. **Modernizing data infrastructure and migrating data systems to the cloud can help make this a reality.**

With the help of **interoperable data systems,** educators can **leverage data to help improve schools at a systems level** – from tackling chronic absenteeism before it becomes an issue to changing instructional approaches through student-centered insights that improve graduation rates.

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THANK YOU

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INTRO

HOW MUCH DO CLOUD SERVICES COST?

The CoSN resource Saving Money in the Cloud provides guidance on calculating the difference between cloud and on-premises hosting.

School systems often cite convenience, enhanced security, and the potential for reduced costs and maintenance as reasons for moving to the cloud, but the benefits go further than that. **Cloud-hosted applications, tools, and resources mean less hardware and equipment for IT departments to manage.** They allow IT staff to outsource some of the technical expertise needed to deploy and maintain complex data systems. Cloud services can allow districts to shift budgetary expenses from Capital Expenditures (CapEx) to Operational Expenses (OpEx), eliminating the need for large, one-time investments in computer hardware. They can also expand a school system's options for Single Sign On (SSO).

Cloud services can make it easier to bring together siloed data sources. Instead of spending hours pulling together data from multiple sources via manual imports and exports, educators can spend their time and energy on improving educational outcomes. Data interoperability powered by cloud infrastructure can streamline classroom instruction and administrative office procedures while providing educators, parents, and students with secure, anytime, anywhere access to their education data.

Since the COVID-19 crisis, cloud adoption, infrastructure, spending, and development have been on a rapid upward trajectory. Cloud computing has profoundly changed the way we live our lives and conduct business. Today more than 94% of businesses and institutions worldwide use the cloud, with an estimated 100 million zettabytes of data stored in the cloud by 2025 (the equivalent of 100 billion terabytes). Cloud computing isn't just about infrastructure; the cloud allows for software as a service to thrive, from applications like Salesforce to Zoom. While productivity and utility applications have made some of the most successful cloud migrations, exciting instructional technologies made possible by cloud architecture are emerging in education. For example, consider the emergence of cloud-based software powering the integration of video and instructional content, or immersive virtual learning experiences allow students to take AP Chemistry regardless of physical location.

TAKE A ROAD TRIP . . .

WHAT IS THE CLOUD?

To be successful in the cloud, it's important to build buy-in with non-technical folks. Check out CoSN's Guide to the Cloud for an introduction to the benefits of cloud services.

...with the Unicorn team to see how different districts across the United States implemented cloud infrastructure to achieve their goals with data interoperability. Then, see what practical steps you can take to get there.

CASE STUDIES OF CLOUD INTEROPERABILITY & INTEGRATION:

aws

Loudoun County Public Schools' digital transformation in the cloud

Loudoun County Public Schools (LCPS) in Virginia serves more than 82,000 students across 82 schools. LCPS has two on-premises data centers, which are 30 and 15 years old respectively, with 62 on-premises servers. After experiencing several unit failures in recent years – including a two-day down period caused by a power outage – LCPS felt the strain of aging infrastructure and decided to explore leveraging the cloud.

LCPS started experimenting with the cloud by deploying small workloads in the Amazon Web Services (AWS) environment. After their team of system engineers confidently grew their cloud skills, they migrated their student information system to AWS over a period of seven months. This allowed families immediate access to their students' grades during times of high demand, such as when report cards were released.

With less physical hardware to deploy and manage, the district can focus on improving systems and workflows. The shift to cloud technologies has given students, teachers, staff, and parents timely access to student data.

Google Cloud

Cutting costs and time by 92 percent each at KIPP

The KIPP Chicago team wanted to spend more time analyzing their data and less time managing it. Using Fivetran with Google Cloud Platform and Google BigQuery, the data scientists at KIPP were able to achieve this goal.

KIPP Chicago's research and analysis team was spending excessive time and resources integrating information into their data warehouse from multiple sources. To solve the problem, KIPP turned to Fivetran, which builds technology to help analysts load data into warehouses. Fivetran's connectors bring data from multiple applications and databases into one central location. Fivetran recommended that KIPP Chicago use Google Cloud Platform and Google BigQuery for their data warehouse since it requires no additional hardware and is easy to use and manage.

KIPP used Fivetran's connectors to import data from many sources into Google BigQuery, including Oracle, Salesforce, school district databases, and more. Previously, it had taken up to a day of programming to import the data, but Fivetran's connectors reduced this to a few minutes.

Now, KIPP can easily populate its Google BigQuery data warehouse and seamlessly analyze data across systems. Moving to Google Cloud reduced KIPP Chicago's data warehousing costs from $500 per month to under $40 per month. Most importantly, KIPP was able to leverage their data to improve academic performance and graduation rates.

Microsoft

Helping Georgia students graduate with Microsoft Azure

Georgia's Forsyth County is one of the fastest-growing counties in the US. The Forsyth County School District is the seventh-largest in Georgia with 40 schools, over 8,000 full-time and part-time employees, and more than 51,000 students. Forsyth County needed a way to identify students needing support, particularly those who were at risk of not graduating.

Previously, Forsyth County Schools had siloed student data, which could not be analyzed or accessed in a timely manner. Leadership teams analyzed all student data individually, and time and in-depth background knowledge were required to gain meaningful insights.

Forsyth chose Microsoft Power BI Premium as an analytical tool for its affordability and ability to bring everything together in one place. It used Microsoft Azure SQL Database to bring in and incorporate all of the necessary data.

Using PowerBI datasets to model how the data should be connected, Forsyth users could begin analyzing data in Power BI immediately rather than spending time structuring data before getting started. These models are supported by a data lake built on Azure Data Lake Storage.

With Microsoft Azure and Power BI, Forsyth created dashboards and reports showing graduation standing to help counselors determine when a student needs academic help and create a plan to get them on track for graduation. Additionally, reports highlighting trends over courses, GPA, attendance, test scores, and more enabled administration to step in and help students early on. Now, the district is aiming to move its 94 percent graduation rate to 100 percent and help as many students succeed as possible.

PRACTICAL PATHWAYS TO THE CLOUD

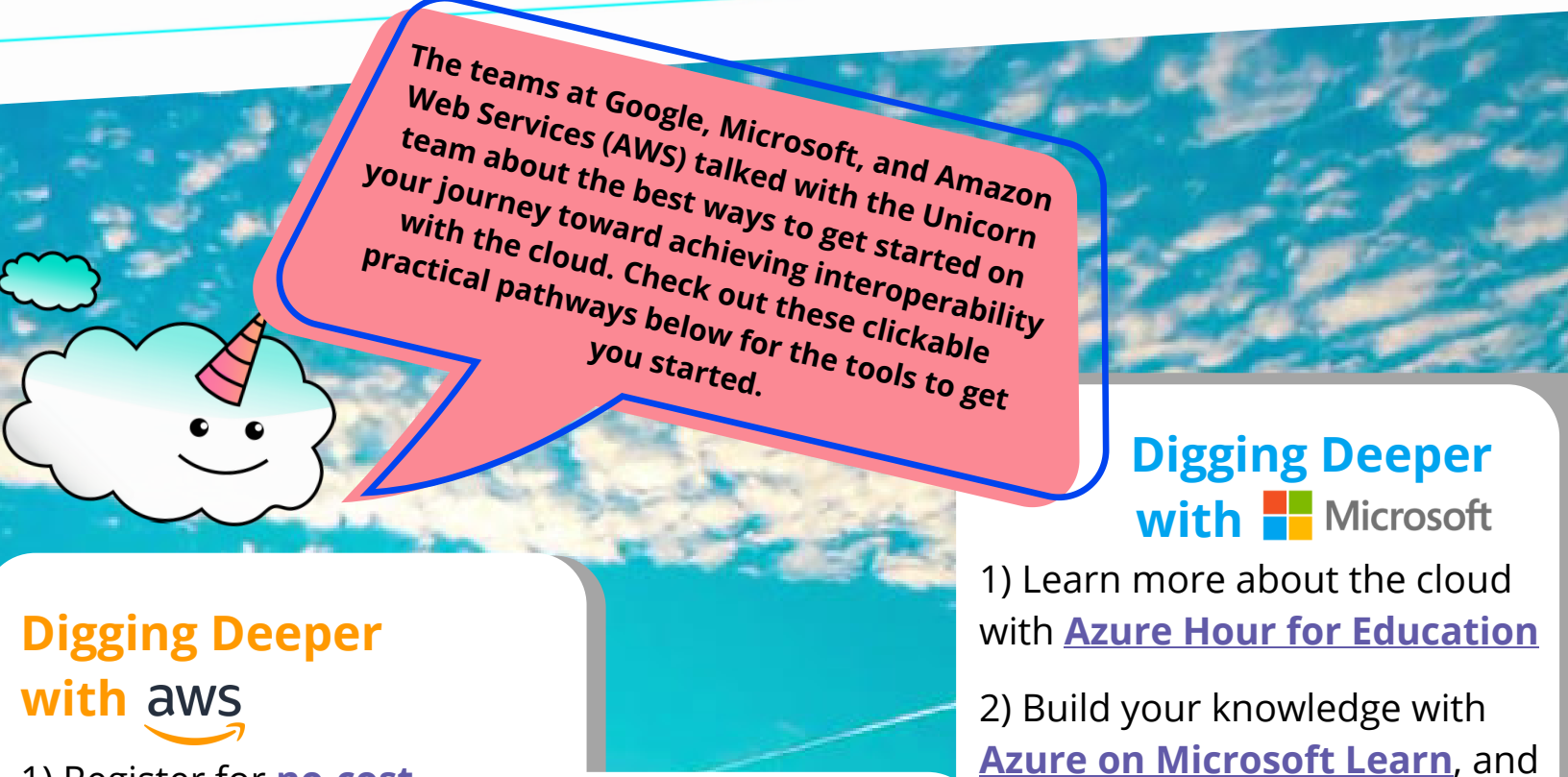
Preparing for a transition from your on premise data infrastructure to the cloud may seem like a Herculean task, but with the right tools, you can be on a nimbus in no time. Follow these crucial steps to get started:

1. Talk to technical team members, especially those responsible for data analysis and reporting. Understand how they will be using the cloud to integrate and analyze data, and what features are most crucial to them.
2. Perform a cost-benefit analysis to better understand the potential savings of moving to the cloud. Consider the long-term savings such as replacement server costs and ongoing maintenance. Even though there may be more costs up front, the long-term savings of moving to the cloud are often extremely worthwhile. Check out CoSN's resources for calculating the **Total Cost of Ownership (TCO)** and the **Value of Investment (VOI).**
3. Audit user needs to understand how different stakeholders across your system will use the data: for example, educators, students, parents, and administrators.
4. Take inventory of current tools and products in your district's ecosystem to determine which cloud solution will work most seamlessly with your existing ecosystem.

CLOUD PREPARATION CHECKLIST

- [x] TEAM PLAYLIST
  - [ ] CTO
  - [ ] DEVELOPER
  - [ ] CIO
  - [ ] TECHNOLOGY SPECIALIST
  - [ ] DATA ANALYST
  - [ ] DATA SCIENTIST
- [ ] COST-BENEFIT ANALYSIS
  - [ ] DIRECT COSTS (E.G. SOFTWARE LICENSES)
  - [ ] INDIRECT COSTS (E.G. ELECTRICITY TO POWER SERVERS)
  - [ ] CAPITAL COSTS (E.G. MAINTENANCE OF PHYSICAL SERVERS)
  - [ ] INTANGIBLE COSTS (E.G. EMPLOYEE EDUCATION TIME)

- [ ] AUDIT USER NEEDS
  - [ ] EDUCATOR
  - [ ] STUDENT
  - [ ] ADMINISTRATION
- [ ] AUDIT OF EXISTING EDTECH ECOSYSTEM
  - [ ] EDTECH TOOLS USED
  - [ ] RFP PROCESS



The teams at Google, Microsoft, and Amazon Web Services (AWS) talked with the Unicorn team about the best ways to get started on your journey toward achieving interoperability with the cloud. Check out these clickable practical pathways below for the tools to get you started.

Digging Deeper with aws

1) Register for [no-cost AWS online training]

2) Learn about [AWS managed services] for data solutions

3) Find out about AWS's [Glue DataBrew] data visualization tool

Digging Deeper with Google Cloud

1) Enroll in the [Google Cloud startup program] to start building

2) Learn more about [EdTech solutions on Google Cloud]

3) Learn more about [Google for Education solutions]

Digging Deeper with Microsoft

1) Learn more about the cloud with [Azure Hour for Education]

2) Build your knowledge with [Azure on Microsoft Learn], and the Microsoft Education Blog

3) Train your team: [Microsoft LEARN] offers these free courses on cloud administration!
Carnegie Mellon University: [Intro to Cloud Administration] and [Intro to Cloud Development]
Oxford University: [Cloud and Artificial Intelligence: Principles of Edge Computing]

CONCLUSION

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Thanks for taking this journey to the cloud with the Project Unicorn Team! There are many different options to support your data storage needs and your interoperability journey. If you have further questions or you're ready to get started, reach out to see how you can go further with cloud computing.

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Consortium for School Networking	Cloud Computing resources	cosn.org/edtech-topics/network-design/#cloud
Amazon Web Services	AWS Contact Form	amazon.com/education/K12-primary-ed/
Google Cloud	gcpk12@google.com	cloud.google.com/solutions/education
Microsoft	Contact Us I Microsoft Education	The Microsoft Cloud – Trusted Cloud Platform