



Q4 Education Newsletter

December 2020

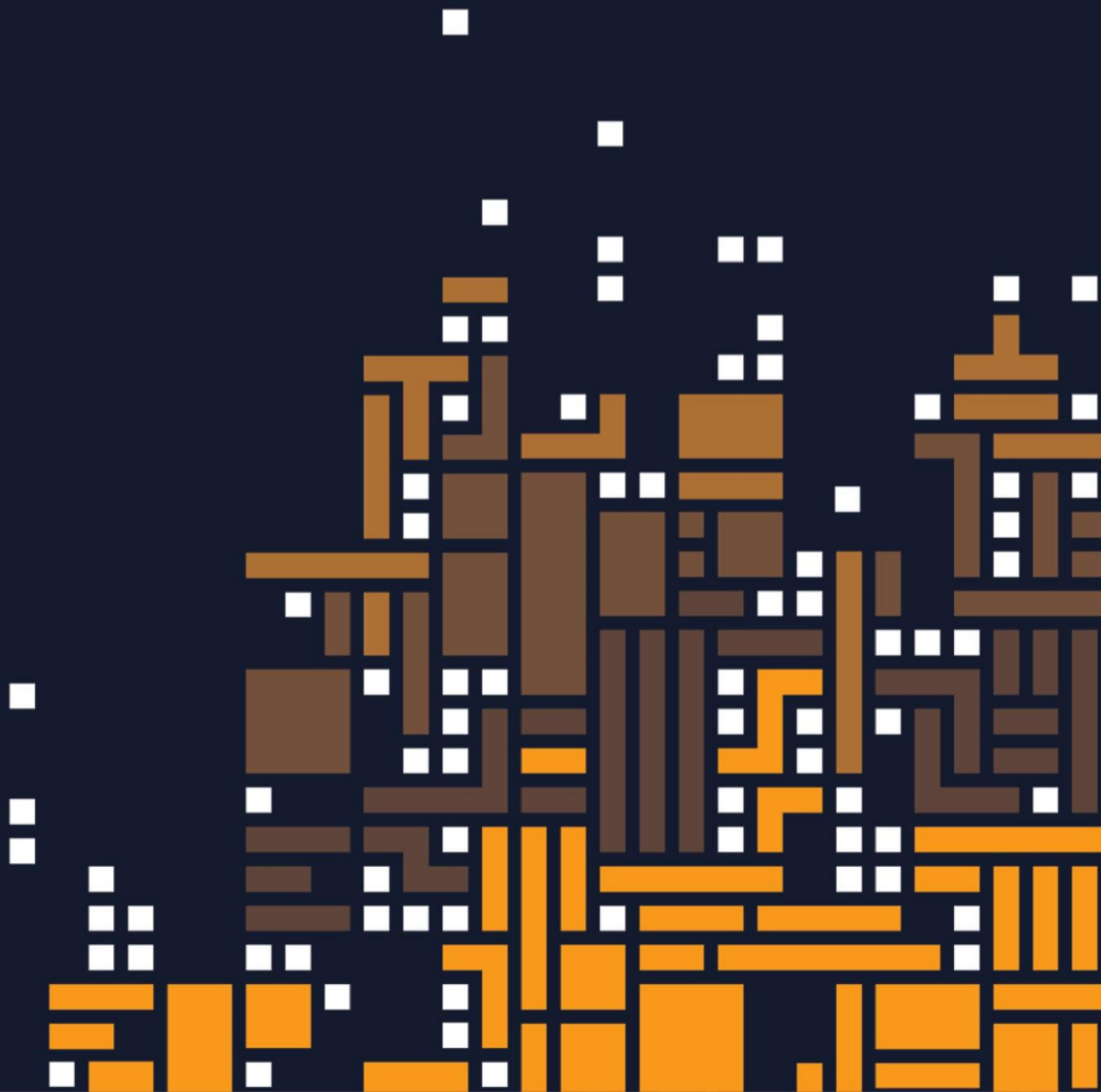




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A Foreword from our Country Leader

Years ago, the cloud was declared the “new normal.” Today, as we deal with the current situation, we are seeing just how technology is enabling businesses and organizations to operate in a seamless way.

This inaugural newsletter comes at a pivotal time. Many of you have expressed the desire to move quickly, and we have resources and stories to share to help you address shared challenges in education using the cloud.

At Amazon Web Services (AWS), we appreciate customer feedback. Resoundingly, you’ve asked us to be better at showcasing what’s happening in Canada. This newsletter is our commitment to you. You can learn about what others in the space are doing, find out about our programs, and most of all, get inspired to tackle your pain points with our help.

In these unrepresented times, I am wishing you a successful school year, and I look forward to meeting you in person soon.

Stay safe,

Rejean Bourgault



Rejean Bourgault

Country Leader, Public Sector
Leader National, Secteur Public

Amazon Web Services





Customer Success Highlights

Canada's first university to move operations into one secure cloud infrastructure sets the stage for the future of learning

At a time when you can personalize everything from your online shopping experience to your dating prospects, it seems only reasonable to ask: why can't students "swipe right" on their course load? Why can't a degree be structured around what someone wants to learn or how they learn, instead of what's traditionally part of the program? In other words, why isn't it possible to choose your own adventure in a university environment?

Athabasca University (AU), Canada's Online University, recently completed a six-month rapid cloud migration project with Amazon Web Services (AWS) to construct a secure, flexible, and global infrastructure required to make personalized learning an infinitely scalable reality. With the completion of its cloud migration project, AU became the first post-secondary institution in Canada to move its entire digital operations infrastructure into its own secure AU cloud environment powered by AWS.

"The completion of this project is a foundational cornerstone in our digital transformation strategy and sets the stage for AU to fulfill its Imagine: Transforming Lives, Transforming Communities strategy and provide even greater access to advanced learning around the world. This cloud computing environment empowers AU to deliver new digital innovations in post-secondary research and online curriculum design," said Jennifer Schaeffer, Vice President Information Technology and Chief Information Officer at AU.

"Bringing all our data together in our own cloud environment will make artificial intelligence (AI) and machine learning at scale possible. It also makes IT systems' downtime a thing of the past with disaster recovery in place that takes seconds, not hours. Learners around the globe rely on our accessible learning around the clock."

As AU celebrates its 50th anniversary this year, a survey was commissioned by the university entitled, "The Future of Learning," conducted by Angus Reid, which uncovered Canadians' predictions of what the future of university learning will look like within our lifetime. Interestingly, close to six in 10 (57 per cent) Canadians believe robots with AI will one day teach students alongside professors. And more than half of all Canadians (56 per cent) say university degrees will become much more individualized in the next 50 years. Things that seemed completely improbable just a few years ago are now becoming realities.

This new era of radical personalization is only possible to scale with the supporting technical infrastructure. And remarkably, because traditional place-based universities aren't designed to provide 24/7 remote access for learners, most don't have the technical infrastructure that will be required to deliver the kind of innovations Canadians predicted in the study.

"AU has been progressive in reimagining what education delivery is and finding new ways to enable learners to have more choice," said Jeff Kratz, Director, Worldwide Public Sector at AWS for Latin American, Canada, and the Caribbean. "This migration marks a first in Canada, with AU being the first post-secondary institution to migrate all-in to the cloud. It paves the way for other institutions to have confidence to accelerate their own digital transformations."

AU has been deeply committed to making learning more accessible and obtainable over its 50-year history. It has consistently strived to remove barriers that previously locked people out of higher learning due to finances, learning disabilities, family circumstances, and other obstacles.

Technology has been, and will continue to be an important factor in removing barriers to access and driving innovation in the post-secondary sector. More than 25 years ago, AU became the first university in the world to introduce an online MBA program. It's now the largest online MBA program with more than 4,000 alumni.

"At AU, we believe that when learners have agency over their education, they can advance their individual goals without sacrificing other important parts of their life, like raising their family or building their career," said Dr. Neil Fassina, President of AU. "We are excited about the opportunities this technology infrastructure will create to help AU move forward and realize the future of learning. We believe we'll be able to reach more people in more customized ways in more parts of the world to support everyone's lifelong learning aspirations."

[Learn more](#) about Athabasca University and what makes AU unique.

Based in Toronto, Ontario, [Humber College Institute of Technology and Advanced Learning](#) is Canada's largest college. Humber offers a broad range of advanced academic credentials as well as the latest technology and teaching methodologies across state-of-the-art labs and learning spaces designed to emulate real-world environments and experiences.

Canadian University Searches for Reliable Remote Access

One of the first initiatives of Humber's digital education strategy was to enable remote access to academic applications so that students would have the flexibility to access course resources regardless of the device used when outside the physical campus. Humber also considers this virtualization initiative to be a potential long-term solution as it reduces the number or size of computer labs thereby enabling them to be repurposed to provide value for their students and facilitates a Bring your own Device (BYOD) model thereby optimizing their resourcing investments.

As part of these strategic goals, Humber had been in communication with Onica regarding Amazon Web Services (AWS) capabilities in this area. They initially sought a Proof of Concept (PoC) to determine how the platform would work and to gain confidence in the approach of using cloud technologies, as they were looking to expand it to all of their campuses in the future.

However, the global COVID-19 pandemic brought about social distancing directives from public health authorities. This led to the abrupt and complete shutdown of all Humber campuses serving over 30,000 full-time students, and Humber's only academic application access was via 2,450 on-premises Windows workstations in dedicated physical locations. They suddenly needed an accelerated response solution to enable remote access to a portfolio of over 300 academic applications through any device, by any authorized user, in any location.

Resourcing a Business Continuity Solution in One Day

Humber had worked successfully with Onica on a cloud migration project, and was confident in Onica's expertise. Conscious of the impact any downtime would have on students, Onica and Humber fast-tracked all internal processes so Onica could resource the project in one day, eliminating weeks of lag. Onica brought in a dedicated local technical team to work alongside five Humber representatives to implement the project. Onica designed, tested, and implemented a production-grade Amazon AppStream 2.0 environment integrated with the Humber on-premises data center. It chose [Amazon AppStream 2.0](#) to deploy Windows-based applications on AWS because it simplifies application distribution.

Moving Faster with a Clear Purpose

In less than 10 business days, Onica created the application environment that now provides reliable remote application access to all full-time Humber students. This represents a significant acceleration for Amazon AppStream 2.0 projects, where a typical schedule is at least 30 days to the first POC application, with another 15 days required for production release. By the project's completion, targeted for summer 2020, at least 80 percent of Humber applications will be available remotely through Amazon AppStream 2.0.

Humber has also simplified the deployment of academic applications for end users and may not need to provision Windows desktops in the future, which is a complex and resource-intensive process. With built-in

scalability and resilience, the solution can very quickly scale up or down as needed. As a result, Humber is no longer limited to manually provisioning and maintaining a set number of desktop systems.

Enabling Student Achievement, with Minimal Disruption

One of the greatest benefits of the project is the highly secure availability of academic application resources to students on any device from any location, provided they have quality internet access. Other benefits include improved accessibility and flexibility and the recovery of campus space optimized for other purposes.

The project's success enables Humber to maintain its business model during a shutdown, while giving students the resources they need. "We are really happy to have brought Onica on as our partner," says Ryan Burton, Director of Digital Solutions for Humber College. "The team was able not only to produce a solution that fit Humber's accessibility, scalability, and performance requirements, but also to accomplish the task at an unprecedented speed using Amazon AppStream 2.0. Onica's efforts and support have helped us provide academic stability to our students during these challenging times, with minimal disruption."

[Learn more](#) about the AWS services used by Humber College and implemented by Onica.



Humber brings experiential learning online to students



Sarah Saccomanno

Humber College Bachelor of Design student Sarah Saccomanno was creating a soft circuit as part of her third-year Critical Making and Experience Prototyping course. She had all the tools she needed and her instructor checked in on her to examine her work. But rather than the exchange taking place in a classroom, Saccomanno and her instructor were in completely different parts of the city, collaborating through an online 3D modelling program.

With many of Humber's students learning virtually, Saccomanno's experience is an example of how the college has reconfigured its programming for an online delivery that still creates opportunities for students and educators to have meaningful exchanges using various platforms and technology.

"Our degree and qualification is all about brainstorming, and the digital tools Humber has invested in really compensate for the fact that we aren't on campus," says Saccomanno of the Design program, which focuses on user experience (UX) design. "If we didn't have those tools, we would have been left with readings and live lectures. But now we can still brainstorm over webcam, we can use Mirro for digital whiteboarding, we can still chat with teachers."

Gina Antonacci is Humber's associate vice-president of academic. In her role, Antonacci provides leadership to the college's academic division, which included being involved in adapting programming when the pandemic hit. She says 80% of Humber's fall 2020 courses are being offered online and 20% are face-to-face or a blended delivery. While six of the college's full-time programs have been deferred, in whole or in part, until January 2021, 60% are fully online. "While the principle we've been using is that everything that can be delivered online will be, we also understand that the college experience is very experiential and students miss face-to-face engagement," she says. "That's why it was so important for us to find ways for students and their instructors to still collaborate and engage with each other. Through surveys, we've learned that when students had a positive experience in an online course, it was related to a positive experience with a faculty member."

Beyond investing in a range of collaboration tools, Humber became the first Ontario postsecondary institution to implement Amazon's [AppStream 2.0](#). The fully managed application streaming service provides users instant access to desktop applications from anywhere. This means students can use their home computers to access much of the software they would typically encounter in a Humber computer lab.

"We've had more than 2,000 students launch over 10,000 sessions with this service," says Antonacci. "COVID thrust us into a reality where we've had to move to be innovative, and I think we've responded. We're always examining how we can further enhance the online experience."

Humber's innovation is also being demonstrated through its facilitation of virtual global experiences. This summer, for example, the college hosted a five-week Beyond COVID-19: Global Systems Gap Challenge. It saw 390 students from 27 countries collaborate in virtual teams of four to examine complex world problems using a systems thinking approach to identify possible paths to future solutions. Humber faculty served as mentors and a panel of experts picked eight winning teams.

In addition to being a huge success, Antonacci says she believes such opportunities and Humber's overall approach to online engagement will result in students gaining a valuable skill set for an increasingly digital work landscape. "While we're focusing on meeting students' needs, we also expect these experiences will enhance conflict resolution and communications skills and the ability to be adaptable," she says.

Since the start of the fall semester, Saccomanno has had

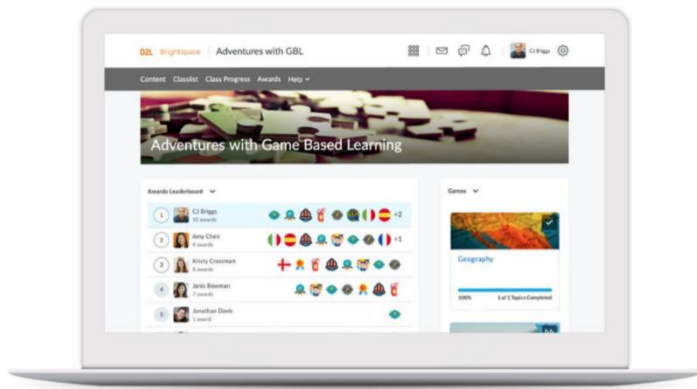
many opportunities to put such skills into practice. When she isn't tinkering with digital soft circuits or attending her online Humber lectures, Saccomanno might be virtually exploring the streets of Osaka, Japan or learning Japanese design in her Zoom class at Kansai Gaidai University.

She's currently participating in a virtual semester exchange as well as an intercultural engagement program that immerses her in local Japanese culture through videos, interactions with her Japanese counterparts and various online activities.

With Humber's efforts to connect students both locally and globally, Saccomanno echoes Antonacci assessment of acquiring skills she may not have otherwise.

[Learn more](#) about Humber College.

How education tech company D2L tackled the surge in online learning



When educational technology company D2L (Desire2Learn) launched more than two decades ago, remote learning meant distance education courses delivered by mail. Computers and the internet were revolutionizing the world, with the glaring exception of most education systems. “For anyone who took a distance education course at that time, it was a pretty bad experience that involved mail, envelope and stamps and very slow feedback cycles,” says Jeremy Auger, chief strategy officer of the Kitchener-based global software company he co-founded in 1999 with president and chief executive officer John Baker.

“This new-fangled technology called the internet was emerging and everything was starting to go online and we thought we could have an impact on education,” adds Mr. Auger. They were right. Over the past 21 years, D2L has gone from five to 875 employees and its flagship [Brightspace](#) platform delivers online and blended learning for K-12, post-secondary, corporate and government clients in 40 countries.

But while the company’s leaders saw the digital transformation of education, they couldn’t have foreseen the sudden surge in demand for their technology brought on by a worldwide pandemic that closed schools and businesses worldwide earlier this year. “We’ve seen quite an uptick in demand, with everyone having to go fully online in many places,” Mr. Auger says. That’s an understatement.

Existing clients went from hundreds of users to thousands, and from thousands to tens of thousands seemingly overnight. New clients were scrambling to put in place fully online programs accessible to teachers, administrators, students and parents, or employees and executives trying to work collaboratively from afar.

“Many of our customers previously were using our system for things like blended learning, so it wasn’t a fully online experience. It was more a technology to complement face-to-face learning,” Mr. Auger says. “When they had to go fully online ... all of those users were almost full-time in the system.”

The sudden spike in users put unprecedented demands on the company’s technology infrastructure. Fortunately, D2L decided several years ago to get out of the business of building infrastructure and migrate to the cloud, in particular the [Amazon Web Services \(AWS\) Cloud](#). 21 years ago, D2L’s software was deployed on site, “in some cases under a professor’s desk,” Mr. Auger says. As the business grew, D2L had to build its own data centres around the globe because some countries required local hosting within their borders.

By migrating to AWS, Mr. Auger says D2L is now part of a global network that’s better able to serve its international clients, without having to build its own new data centres.

“It allowed us to focus on our core competencies ... including services and products we were delivering, as opposed to the underlying infrastructure, which AWS can do at scale,” he says. AWS enabled D2L to ramp up quickly when the pandemic hit, and without any major service disruptions.

“If we were to have to address that ourselves in the old way, we would have been buying hundreds and hundreds of servers and racking them in data centres all around the world,” Mr. Auger says. “(AWS) was part and parcel of being able to, in a very short time period, accommodate that massive uptick in usage across almost all of our customers.”

D2L clients, including the Calgary Board of Education, also benefitted. When Calgary schools closed in the spring, the platform helped deliver courses to the board’s 126,000 students. During this pivotal moment of global need, D2L has been supporting all 50 colleges

in South Africa as well as New York University and Carleton University, and they will be rolling out a new partnership with all of Singapore’s Polytechnic Institutes of Technical Education. Numerous companies and industry associations have also brought in Brightspace to train many of the thousands of returning workers in new safety protocols and digital skills as businesses begin to reopen.

The school and business closures have accelerated a transition to online learning that D2L has anticipated for decades, Mr. Auger says. He believes the focus must now move beyond emergency response to building resilient, high-quality education that blends in-person and digital learning.

“We feel like we’re just getting started,” he says, “and the pandemic has quickly shifted what was a technological evolution into a technological revolution, which will accelerate the next phase of our growth.”

[Learn more](#) about D2L and their learning platform.



Crowdmark is a grading and analytics platform that digitizes the paper based exam and homework workflow so that educators can grade student exams and homework online in the web browser. Students write out their answers with a pencil and a piece of paper, take a photo, and upload their answer via mobile device. Answers are uploaded directly by students or by an instructor into Crowdmark and then graded online.

On average, educators can grade 3X faster than traditional workflows, while at the same time providing richer, more formative feedback to students. The platform is tailored for professors from universities and colleges and serves 27% of all undergraduate students in Canada and 34% of all undergraduate students in Ontario. Crowdmark also serves customers around the world including the USA, Europe, Asia and New Zealand.

In March, the Global Pandemic hit and educators were asked to pivot their courses online overnight, and some with very little support. Remote assessments including exams, assignments and labs posed one of the biggest challenges. Recognizing that this was a very challenging time for educators and students, Crowdmark offered their platform for free to anyone that needed to move their courses online from March 10th through May 31st.

"The idea was if they needed to move their assessments online, we would be there to help support, get them through the semester and get them through to the end of the year" says Michelle Caers, CEO, Crowdmark. "In that period we had hundreds of instructors sign up, and thousands of assessments taking place, from universities and schools around the world. All of our metrics indicated that the in-class assessments stopped abruptly and then the online assessments just skyrocketed."

*"We had many of inquiries from customers who knew they had a large exam coming up and would have 2,000 students taking an exam and uploading at the last minute. They wanted to ensure that our system can handle the load. Our standard response to them was that because we're hosted on AWS, we can handle it. In fact, the phrase we used was **AWS can handle more than anything Crowdmark can throw at it.**"*

How AWS helps Crowdmark to scale and innovate

"Crowdmark is offered as software as a service. And this really simplifies things for our customers because implementation is almost instantaneous" says Michelle Caers. "To date, we've graded over 67 million pages of student work, and all of that is stored online on [Amazon S3](#). AWS allows us to scale quickly and reliably and confidently because we are operating in a very high stakes situation, which is final exams, midterms, tests, assignments and student data. So we need to ensure that we're providing a very reliable service, and AWS supports that."

Keeping staff and students safe

Crowdmark enables instructors to provide the same level of assessment as they would in person, but in a much safer way for both instructors and students. In terms of accessibility for students who may not have strong internet connectivity, Wi-Fi, or a laptop available, with Crowdmark, all they need is a pencil, a piece of paper and a mobile phone, and they can complete their assessments. "I've heard of cases at schools that didn't use Crowdmark, where some students had to write out a 20 page essay on their mobile phone because they didn't have a laptop or access to Wi-Fi." says Michelle Caers. "With Crowdmark, they would have been able to write it out in their notebook, take photos, and upload it, which would have been a much better experience for

the student. So, not only do we make it a safe environment during COVID-19 with a touchless experience, but the software levels the playing field for everyone who may not have access to the same level of technology."

Security

"As we work with universities and colleges, often institutions would ask about security and compliance, specifically [SOC compliance](#)." Says Michelle Caers. "So what we've been able to do is share AWS security resources and use [AWS security and compliance documentation](#) to help our customers understand that we are compliant with the type of security that they require. So, that's been really helpful. Generally speaking, when our customers ask us how and where we're hosted, they often feel reassured when we tell them that we're hosted on AWS."

Crowdmark has spent the last 9 months building and supporting a rich and robust remote exam workflow. Schools that invest in Crowdmark have the confidence that regardless of how the school year unfolds, Crowdmark can be used purely for online classes, purely in class, or used in a hybrid format.

Learn more about the [Crowdmark](#) assessment platform and their response to COVID-19.





Amazon is powering the coronavirus diagnostics of the future



Dr. Savvas Nicolaou and Dr. William Parker stand beside a CT scanner

The lung scans of coronavirus patients coming out of Wuhan, China had the tell-tale signs of infection. While healthy lungs would usually show up as dark, these were showing the white haziness doctors describe as “ground glass” on chest x-rays and CT scans, resembling the splintering of a car windshield, and in some cases, a near total whiteout. These patterns in the lungs were familiar to Dr. Savvas Nicolaou, a professor of radiology at the University of British Columbia and the director of emergency and trauma radiology at Vancouver General Hospital in Canada. When COVID-19 started spreading in January, he teamed up with Dr. William Parker, a radiology resident at the University of British Columbia.

Parker is a cofounder of SapienML, a company that has developed software to anonymize medical imaging data, along with Nicolaou and engineer Brian Lee. The three of them had previously worked together on an artificial intelligence model trained on chest x-rays. “We thought, well, can we see the findings of COVID-19 in that model?” says Parker. They put out a call to collect as many chest x-rays and CT scans as possible to start building an open source AI model analyzing how the disease displays in the lungs, with the goal of developing an alternative way to diagnose patients besides existing tests.

Among those who answered the call to help Parker, Nicolaou and Lee build these CT scan diagnostics? Amazon. In January, Nicolaou called Dr. Shez Partovi, a friend from his radiology residency 25 years ago, who now leads the healthcare life sciences, genomics and medical devices division at Amazon Web Services. He told Partovi about their plan to “use AI to empower physicians across the world in helping combat this disease” and the project took off from there.

Though most people know Amazon as a deliverer of goods, its biggest source of operating profit ([67% for the fourth-quarter](#)) comes from its colossal cloud computing business line, known as Amazon Web Services. The operation, [estimated](#) by one Wall Street analyst last year to be worth half a trillion dollars, offers a number of services to its customers, including storage, web hosting, and — of particular interest to researchers fighting the COVID-19 pandemic — machine learning applications.

In March, AWS announced its global Diagnostic Development Initiative, offering an initial [\\$20 million in cloud credits](#) and technical support to help accelerate research and development of coronavirus diagnostic tools. Instead of giving direct cash grants, the selected projects are getting a break on what they would normally have to pay AWS as a credit to their account. The tech support varies on a project basis, but includes access to AWS specialists.

The program is supported by a technical advisory group of scientists and public health experts yet to be disclosed, except for Steve Davis, co-chair of the World Health Organization’s digital health technology advisory group. At launch, there were 35 global research institutions, startups and businesses involved in the project. AWS has since received more than 45 additional applications from customers, which are being evaluated.

Nicolaou and Parker’s team is the first public diagnostic customer, says Teresa Carlson, vice president of Amazon Web Services Public Sector. Other partners include the Chan Zuckerberg Bio hub, a nonprofit research

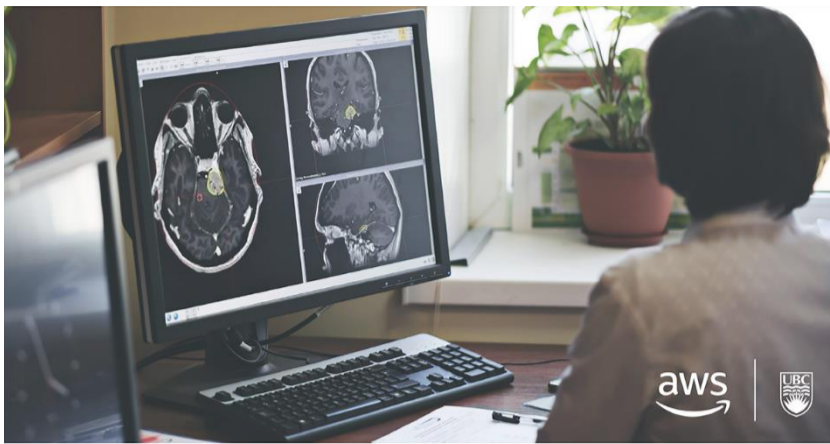
collaboration founded by Facebook CEO Mark Zuckerberg and his wife Priscilla Chan. The Bio Hub is utilizing AWS to optimize machine learning models with genomics data to estimate how many cases of a disease are in the population beyond what confirmed test results indicate. Estimates of the scale of pandemics can contribute to infectious disease research, and inform public health planning and preparedness.

Another participant is Beijing’s ETComm, which provides telemedicine services for medical institutions in China to remotely diagnose cardiovascular disease. The company completed more than 18,400 remote diagnoses of COVID-19 complications via its electrocardiogram reading platform built on AWS. Doctors at the University of California San Diego have received AWS credits for a [clinical research study](#) using artificial intelligence to speed up the diagnosis of pneumonia in COVID-19 patients based on chest x-rays.

Continued on next page.



Amazon is powering the coronavirus diagnostics of the future (cont.)



The AWS diagnostic initiative was conceived in January after Carlson's unit, which works with governments, educational institutions, nonprofits and NGOs in over 180 countries, was flooded with calls from customers asking to partner on projects surrounding COVID-19. Her hope is that by Amazon forming this consortium to power many different projects at once, participating institutions will ultimately choose to work together and share their findings globally, speeding the fight against the disease.

Many health systems have struggled to keep pace with the virus sweeping the globe, and public health officials, doctors and scientists have called for more and better testing. But even when patients do get access to tests, there are lingering questions about their overall accuracy and the rate of false negatives (that is, a patient has the virus but the test says she doesn't).

The accuracy concerns in early accounts of COVID-19 lab tests "likely result from manufacturing and procedural failures," says David Boyle, chief scientific officer and co-lead of the diagnostics program at global public health nonprofit PATH. Part of the problem is the speed at which some of the tests, which analyze for the presence of the virus in a patient sample, were fast-tracked by the federal government due to the nature of the crisis. Additionally, he says, labs are facing "a huge backlog of specimens for testing that stresses the human, material and logistical components of a laboratory system."

The coronavirus pandemic and the urgent need for new diagnostics gets to the heart of a longstanding global public health problem — a lack of funding and coordination around diagnostics compared to issues like vaccines, says Steve Davis, who co-chairs the World Health Organization's digital health technical advisory group and is a member of the AWS initiative's technical advisory group. Historically, one reason why there are so many difficulties with testing procedures during an epidemic is simply that "people have focused so much on the cure," Davis says. But COVID-19 is changing that attitude, with more people realizing the value of diagnostics, he says.

Back in Vancouver, Nicolaou and Parker hope that by matching patterns, such as the percentage of the lungs with the ground glass pattern, doctors could help better diagnose patients and link the severity of lung damage to different stages, from hospital admission to ventilation, and, in the worst case, death. The team is compiling what Nicolaou says will be the largest dataset of COVID-19 positive images from around the world. While other local centers might have more data, they won't have the range from different continents, which so far includes North America, Europe, Asia and Australia. A [recent study](#) of more than one thousand COVID-19 patients in China found CT scans were better at detecting the disease than commonly used polymerase chain reaction diagnostic tests. Each image must be labeled by a human and then fed into the model to train the algorithm.

All of the images are stored in the Amazon Web Service cloud, known as S3, or simple storage service. So far the team has tagged 1,000 images and there is a backlog of thousands more. There are currently three different artificial intelligence coding teams developing models: SapienML, the University of British Columbia and Amazon. Other support for the project comes from the University of British Columbia Cloud Innovation Center and the Vancouver Coastal Health Research Institute.

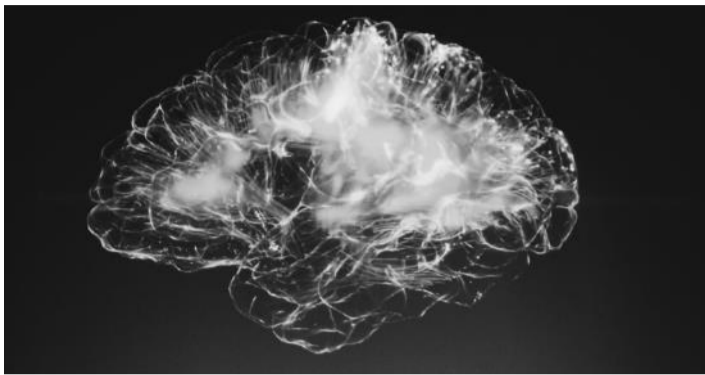
"We're not releasing this as a for profit venture. We're releasing this as a humanitarian effort," Parker says. The team is hoping to release the open source AI model within three months, so that other researchers and companies can start using it. Then they will work towards predictive modeling for patients and correlating their analysis with the existing laboratory diagnostic tests.

The ultimate goal is to go beyond an alternate way to diagnose patients, says Nicolaou. His and Parker's dream is to use the gathered data to enable doctors to create simulations, where a patient's CT scan could be used to virtually model how they might respond to certain therapeutics, thus improving care. With the virtual models, "you would actually start to see [the patient's] response...before you deploy it in reality," says Nicolaou.

Developing new ways to fight the pandemic is at the core of Amazon's initiative, says Carlson. "Hopefully we can speed up the point of care and diagnostics very quickly over the next one to two years with this initial \$20 million investment — but this is just a start," she says. "If we burn through it sooner, we'll come back to the table."



Leveraging AWS to improve the MRI requisition process and eliminate wait times



Today, patients with an MRI request submitted to the Lower Mainland MRI Central Intake Office (CIO) sometimes have to wait months or years to receive their exam. Wait times for MRI exams in British Columbia can vary dramatically depending on the priority of the presenting health concern of the patient. Patients with an emergency condition, such as a stroke, may require emergent scans to be completed within hours, while other patients with non-life-threatening conditions may wait many months for their exam.

Radiologists — medical doctors with expert training in medical imaging — must determine both the priority of an examination and the need for contrast, a medication used in imaging to help find disease processes.

The UBC CIC, (pronounced “kick”) or Cloud Innovation Centre is a public-private collaboration between UBC and Amazon. It serves as a hub for public sector community driven “challenges” that address, over time and across geographies, the critical problems/opportunities facing governmental organizations, including education and non-profits.

The CIC at UBC set out to create a solution that would improve the MRI requisition process across the region, reducing patient wait times and optimizing the prioritization review for radiologists. Triage is the process of determining the priority of patients’ treatments by the severity of their condition. A Machine Learning system was trained to recommend an accurate triage prioritization value (P-value) for requests submitted by ordering providers to increase the accuracy of requisition distribution.

PROBLEM

The MRI CIO was opened in the Fall of 2018 to help manage MRI requests with the goal of optimizing efficiency and improving wait times. This central office provides an opportunity to use advanced computing technology to create analytics and identify areas of improved workflow optimization.

The current intake form process requires ordering providers to manually complete a paper or digitized PDF requisition form and submit it by email or fax to the CIO. The MRI CIO is tasked with distributing 10,000 requisitions per month to eleven different hospital sites.

Differing priority levels and need for contrast medication depend on the patient presentation, and each site’s wait times vary across these standard priority levels. A site from the CIO receives requisitions, and a radiologist determines the priority level and need for contrast medication.

It is common for a requisition to be sent to a site where the wait lists are much higher for a given priority/contrast than another site, thereby unnecessarily increasing the patient’s waitlist time. If the priority was to be determined upstream, patients could be directed by the CIO to sites with the shortest wait time for their assigned priority/contrast.

APPROACH

The UBC-CIC team built a prototype using AWS-managed Natural Language Processing (NLP) services: [AWS Comprehend](#) and [AWS Comprehend Medical](#). A dataset of MRI request forms were collected using [SapientML](#) data extraction software, DataRig, and these were transcribed by the CIO team. The AWS CIC team then used the dataset and AWS Comprehend tools to develop a rules-based algorithm.

This algorithm uses requisition samples to predict a P-value based on the submitted criteria on the MRI requisition. The output will help inform the CIO to assign the patient to an MRI site with the fastest turnaround time. This optimization will aim to decrease the current wait-list time and increase the number of patients who receive their exam within the province’s benchmarked wait times.

The MRI CIO office will test the CANT-WAIT Software solution on a control group prior to larger-scale implementation. Subjective and Objective data will be collected with a focus on program usability, workflow improvement, system accuracy and waitlist improvement. You can find the link to solution on GitHub: <https://github.com/UBC-CIC/vch-mri>

[Learn more](#) about the CIC at UBC.



Automating Zoom transcriptions to drive accessibility for students

As classes transition online, education institutions are working to lessen the impact on students' learning and the strain on instructors working to adapt to these new circumstances. Accessibility is one of the major areas disrupted by this change, and the UBC CIC investigated this challenge with the tools and solutions available.

PROBLEM

At the request of the University of British Columbia's Provost's office, the CIC team explored a solution that will assist students in synchronous online lectures by providing a transcription of the lecture in real time. This solution will benefit anyone who is unable to participate synchronously, as well as students who benefit from seeing course material in written form.

APPROACH

The solution provides a consistent experience for students when instructors deliver course materials through Zoom. Instructors can use this tool to employ live Closed Caption transcriptions. The transcriptions are displayed in real time in the Zoom interface. Faculty and students also have the ability to download the time-stamped transcriptions upon completion of the lecture.

The solution utilizes [Amazon Transcribe](#), [AWS Amplify](#), [AWS API Gateway](#) and [AWS Lambda](#), and it is cost-effective to deploy at rates of \$1.44/hour for Amazon Transcribe. Amplify build and [Cloud Formation](#) are used in combination to deploy this solution.

In order to enable the closed captioning, users will follow these steps:



1. Sign in to the Zoom web portal.
2. In the navigation panel, click **Settings**.
3. Click the **Meeting** tab.
4. Verify that **Closed Caption** is enabled — if not, click the toggle to enable it.
5. If a verification dialog displays, click **Turn On** to verify the change.
6. Enable **Save Captions** to allow participants to save transcripts at the end of the Zoom session.

HOW IT WORKS

The speaker's microphone captures audio and forwards it to the Amazon Transcribe service via WebSocket. This does not capture all speakers in the Zoom lecture, but it is possible to inadvertently do so if the instructor has their speakers on — the browser microphone could capture other audio and relay it to the AWS transcribe service. If an instructor does wish to capture all voices in a session, they would need to consider live-streaming the session and processing the captured audio and video.

Once the IT department has implemented the tool, instructors can go to the tools URL and paste their Zoom CC API token. Allowing microphone access will begin to forward the audio to the AWS Transcribe service for transcription. Once audio begins to transcribe, the Closed Captions will be overlaid on the video. Clicking on the 'Closed Caption' icon in the

meeting task bar will give the option to show a full transcript in the sidebar. If save captions have been enabled, users will be prompted to save the transcript at the end of the Zoom meeting.

By saving the transcripts and uploading them to the course LMS (learning management system), instructors have the option of making the lecture transcriptions available to students. If the "Save Transcript" option is enabled, instructors are also able to add the transcript to their institution LMS for reference.

[Learn more](#) about this project including, costs, Q&A, and a detailed breakdown of AWS services leveraged. You can also view the video analysis of the project found in the article.



York University launches Canada's first post-secondary DevOps program during a crucial time of digital transformation



Tracey Taylor-O'Reilly

In May 2021, the York University School of Continuing Studies will launch Canada's first university-level [Certificate in DevOps](#) to help fill the labor shortage in this rapidly growing technical field.

DevOps is a methodology that combines software development (Dev) and information-technology operations (Ops) to shorten the systems development life cycle while focusing on quality and continuous delivery. DevOps enables separate roles to coordinate and collaborate to better produce digital products and respond to customer needs.

"This program answers a need in the market today, as more and more organizations look to harness the power of the cloud to modernize their businesses and deliver new

and improved services to customers," said Rejean Bourgault, Country Manager of Public Sector, Amazon Web Services (AWS) Canada, Inc. "DevOps is a growing discipline across organizations, and we support York's commitment to developing programs that bridge the IT upskilling gap in Canada."

"Although, the pandemic has slowed or stalled hiring in many industries, emerging technical professions, such as DevOps, are still experiencing labor shortages during this critical, transitional time in tech fields," says Tracey Taylor-O'Reilly, Assistant Vice-President, Continuing Studies.

"Our research indicates that many GTA organizations are at various stages of DevOps adoption. The School's innovative Certificate in DevOps – the first of its kind in Canada – I'm proud to say, will help mid-career IT professionals change or advance their careers by gaining applied knowledge in this discipline. They will graduate with the skills and confidence to pursue DevOps opportunities and emerge as leaders in this new, exciting profession."

According to Gartner's 2019 priority matrix, DevOps will play a central role in organizations undergoing digital transformation over the next two to five years. During the pandemic, many businesses have moved portions of their operations to online delivery or created new digital products in short order. For industries immersed in developing software and digital products today, DevOps adoption would have transformational benefits.

In a 2020 report of top 15 emerging jobs in Canada, the DevOps Engineer role was listed at number seven. Organizations across Canada and the GTA are looking for ways to best staff their teams for DevOps roles, but are facing challenges finding talent. The School of Continuing Studies' new Certificate in DevOps aims to address this talent shortage by providing IT professionals with a robust skillset so they can help facilitate a DevOps cultural and technological transformation within their organizations.

The Certificate in DevOps is developed through collaborative relationships with industry leaders like Fahd Gulzar, Amazon Web Services National Programs Lead, Canada Public Sector. The program is also taught by industry expert instructors to ensure students are receiving a current and relevant education.

The program's part-time, online and accelerated delivery format allows students to graduate faster and pursue

career advancement opportunities in just six months. Students enrolled in the program will deepen their understanding of how DevOps can provide operational and technological benefits to an organization and how to implement best practices that derive maximum value using Agile project management methodologies.

The School's Certificate in DevOps will also allow enrolled students to go deep on specialized knowledge. The program's curriculum includes experiential learning activities and case studies on successful DevOps implementations. Students will engage in lessons to successfully construct a DevOps automated pipeline using trending tools such as Gitlab, Ansible, Jenkins, Docker, Kubernetes with Helm, Terraform, Prometheus and Grafana.

Students also have the added advantage of completing this program as part of a cohort. This means they will advance through the program with the same set of working professionals, encouraging peer-to-peer collaboration and growing their professional networks.

The new Certificate in DevOps is now [open for registration](#) with classes beginning May 3, 2021.





AWS Upskilling & Training



How two schools in Canada and Turkey competed through AWS DeepRacer to skill up on machine learning



Students from two secondary schools on opposite sides of the world used AWS DeepRacer to learn about machine learning (ML). Using AWS DeepRacer, students from a school in Vancouver, Canada and Istanbul, Turkey learned how to design, train, and deploy a model car using ML.

These students competed on virtual racetracks against each other—all within the Amazon Web Services (AWS) Management Console.

About AWS DeepRacer

AWS DeepRacer, the world's first global autonomous racing league, helps anyone with an Amazon Web Services (AWS) account get started with ML through autonomous driving. Developers of all skill levels can get hands on with ML through a cloud-based three-dimensional racing simulator, driven by reinforcement learning. Competitors can race for prizes, glory, and a chance to compete for the AWS DeepRacer Championship Cup. While many past AWS DeepRacer League competitions happened in person, with people practicing social distancing and working from home, the competition is now available virtually via the AWS Console.

Collaborating, competing—virtually

Dr. Peter Holowka, Director of Educational Technology at West Point Grey Academy in Vancouver is an advocate for science, technology, arts, engineering, and mathematics (STEAM) education at his institution. "As an educator, I believe that it is important for students find ways to love what they are doing/learning. They then hopefully spend more years in the discipline," Dr. Holowka said. At a recent education technology conference at Oxford University, he saw a group of students from Turkey presenting—and an idea struck.

Dr. Holowka began to look for ways to bring the students together and learn from one another. He found the answer with AWS DeepRacer. Setting up a virtual AWS DeepRacer league between the school in Turkey and his own school in Canada, the students began working on their models and getting ready to compete virtually. When remote education was necessary due to the COVID-19 pandemic, the competition was able to proceed as planned because it was virtual. The virtual AWS DeepRacer format was perfect for the times—"That's the beauty of it—It costs nothing, is accessible, and you can work on it anytime, anywhere."

The two schools set up a community race in the AWS Console. Each student kept success and failure logs of trials, which they shared to learn from each other. The competition started on a simple oval track and each week they progressed to a new track, more complex track, iterating on what they'd learned. They eventually progressed to the AWS Championship Cup track course.

Students said the competition helped them stay connected with their classmates and boost morale during COVID-19. With these model self-driving cars, they had a chance to, connect and learn from one another. One student said the experience helped him

"gain confidence in coding." Beyond the skills gained, students said working with and competing against other students across the globe also served as a valuable cultural exchange.

Dr. Holowka, an AWS Educate Cloud Ambassador, understands the value of these skills beyond school. He said, "One of the nice parts of this is it exposes these kids to real-world skills," like the cloud-native environments and AWS. "The [AWS Educate program](#) is an authentic way to get kids exposure to cloud computing tools without [financial] risk."

Join the virtual AWS DeepRacer League

Now the [AWS DeepRacer League](#) is available virtually, anywhere in the world. Compete in time trial races and take on new challenges such as head-to-head racing via the AWS DeepRacer console.



aws  educate



Need a pandemic hobby? Get AWS certified.



After months of empty store shelves in some parts of the country, yeast and flour shortages have subsided, and (thankfully) so have the multiple social posts a day of people baking bread or feeding their sourdough starter. The COVID-19 pandemic has given us a lot of time, and for some of us, that's been channeled into warming ovens and eating more carbs than ever before. But for one student in Vancouver, his free time was spent doing something a bit more cerebral. Bill Wang, who attends West Point Grey Academy, recognized that he had some free time on his hands during the early months of the pandemic while he was in Grade 10.

Even though his classes continued remotely full-time at his school, Wang had more time in his day as he did not need to attend school physically. A self-motivated learner, Wang started studying to earn his AWS Certified Cloud Practitioner certification, the foundational level industry-recognized credential from AWS. Preparing for this certification gives learners knowledge of AWS Cloud, including the range of AWS services.

"I've been using AWS a little bit at school, and I'm interested in technology," said Wang. "So instead of just sitting around, I decided I'd prep for the test and take it."

Part of West Point Grey Academy's success in shifting to remote instruction was due to its cloud-first IT infrastructure philosophy.

"While some educational institutions struggled and even closed, our community was very successful and our admissions waitlist got even longer. So much of our success in our emergency COVID-19 shift is due to the great decisions that were made by our IT infrastructure teams and leaders in the preceding years to use cloud computing and bring-your-own-device," said Dr. Peter Holowka, Director of Educational Technology at the school.

Dr. Holowka also runs a technology club where students use the AWS Educate program to learn about cloud computing. This club is especially beneficial for students who cannot fit IT classes into their ambitious full schedules. The AWS Educate program not only comes with labs and micro credentialing opportunities, but there are also credits that students and educators can use to start building on the AWS Cloud. In fact, almost 100 schools across Canada use the program in some capacity to teach students and educators alike.

Before Wang embarked on his AWS Cloud Practitioner Certification, he participated in an AWS DeepRacer competition involving West Point Grey Academy and another school in Turkey. This DeepRacer initiative, an AWS artificial intelligence/machine learning simulation platform, first began in Dr. Holowka's technology club and was further developed as part of a formal IT class when countries were locked down during the pandemic. Having taught Wang previously, Dr. Holowka invited him to join the DeepRacer activity. Wang finished in the top 10% in the world in the international DeepRacer competition in May.

After achieving the AWS Cloud Practitioner Certification in May, Wang became interested in pursuing more AWS Certifications. He turned his attention to the AWS Certified Solutions Architect - Associate certification and achieved that in July. "We are very proud of Wang's achievements. Our school's vision is to be leaders in future-focused learning. When our students excel and achieve internationally recognized IT industry certifications, they embody that," said Dr. Holowka.

For more information on AWS Training and Certification, including certification exam preparation resources, visit [here](#) and follow the AWS Training and Certification [blog](#) and their response to COVID-19.





AWS Events & Resources



Current and upcoming AWS virtual events

AWS hosts events online, bringing the cloud computing community together to connect, collaborate, and learn from AWS experts. Whether you are new to the cloud or an experienced user, you will always learn something new. These events are designed to educate you about AWS products, services, and solutions and help you develop the skills to design, deploy, and operate infrastructure and applications. Event content is delivered by subject matter experts from AWS, our partners, and our customers, who share how they have successfully built solutions on AWS. To view the full list of AWS events, please visit the [Events and Webinars homepage](#).



re:Invent

re:Invent is AWS's largest event with hundreds of streaming sessions across 50+ content tracks with live Q&A by AWS experts. Hear from cloud leaders, and be the first to learn what's new and next from AWS. re:Invent takes place from Nov 30 –Dec 18 and is completely free.

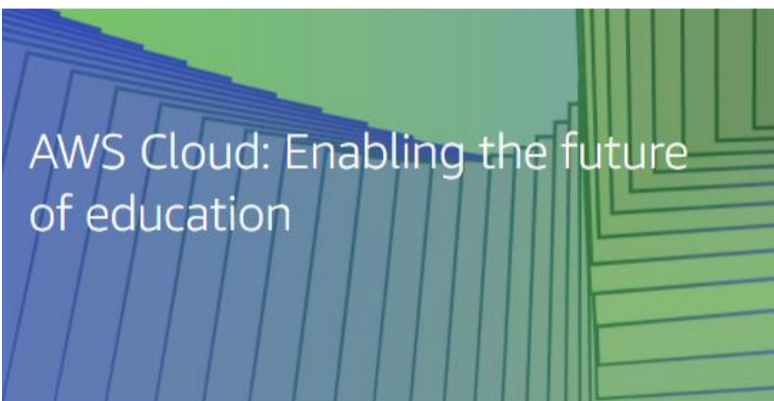
[Learn more and register.](#)



IMAGINE: The new world of education

Join us for IMAGINE: The New World of Education, a webinar series that explores the challenges and opportunities facing education institutions around the world.

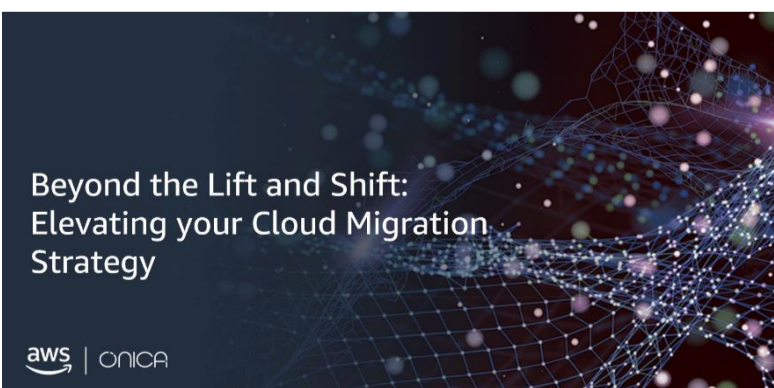
[Learn more and register.](#)



Enabling the Future of Education

This webinar highlights how education institutions are implementing rapid remote enablement by using the AWS Cloud. Learn about security, business continuity, and cost savings, and how schools are facilitating hybrid learning models for the fall/winter semesters.

[Learn more and register.](#)



Elevating your Cloud Migration Strategy

Watch this webinar to learn how Onica helped Humber College build a scalable, reliable, cost-effective cloud-native foundation while modernizing its legacy ERP application on AWS.

[Learn more and register.](#)





AWS resources & support for education

Whether it's the first day in your cloud journey or you have a cloud-first strategy, Amazon Web Services (AWS) has a solution to facilitate teaching and learning, launch student analytics initiatives, and manage IT operations. AWS delivers a set of compute, storage, database, analytics, and application deployment services that lower costs, scale applications, respond quickly in emergencies, and meet the ever-changing needs of the modern student. For more information about AWS in Education, please visit our [Canadian website](#) or sign-up for some of our education webinars below.

Webinar: Cloud 101: AWS Overview for Education



Starting your cloud journey? View this webinar recording to answer your most basic questions including what is the cloud, what services does AWS offer, and how does the cloud help in education?

[Learn more and register.](#)

Webinar: Education Data in the Cloud: Choosing the Right AWS Database



This webinar will introduce key database concepts and AWS products relevant to education. Learn how institutions use AWS database services for websites, student services, and learning analytics.

[Learn more and register.](#)

Webinar: Start Your Cloud Journey: Migration Made Easy



This webinar will help educational institutions understand their options to begin migrating data, servers, and workloads to the AWS Cloud. You will learn how to start a transition to AWS and the tools available to support migrations.

[Learn more and register.](#)

For more information or needs based on the newsletter, please reach out to [Patrick Chammas](#).



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