A CLASSROOM IN THE CLOUD

BUILDING ON SERVICE PROVIDER INFRASTRUCTURE AND BUSINESS MODELS TO CREATE A K-20 EDUCATION PLATFORM THAT REDUCES COST, IMPROVES ENGAGEMENT AND MEASURES STUDENT SUCCESS.

STRATEGIC WHITE PAPER

Transformational change is required in the area of education to improve outcomes for students. Telecommunications service providers are in a unique position to help educational institutions harness the rapidly expanding base of mobile and connected devices to accelerate the use of digital content in the classroom. By provisioning reliable network infrastructure, supplying standardized devices to all students, and partnering with a flexible teaching and learning application, service providers can create high-value opportunities while delivering effective new digital resources that help educators reduce costs, improve teaching tools, access more meaningful performance analytics, recast student engagement, and remodel educational standards worldwide.

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INTRODUCTION

A new market opportunity for service providers exists at the intersection of two categories of compelling market drivers. On the one hand, educators are striving to exploit new teaching resources such as digital textbooks and interactive rich media content. Targeted education-sector funding and policy initiatives such as Race to the Top and Bring Your Own Device are making such resources more accessible. On the other hand, an array of technology drivers — such as the proliferation of mobile devices and rich digital media that plays on those devices, cloud-based delivery environments, open standards and interoperability, and flexible subscriber models — make it possible for service providers to address tens of millions of new subscribers with a comprehensive enterprise service model.

Together, these market forces could change the education experience for the next generation of students from kindergarten all the way through college and university. Departments of education will reduce the cost of lesson-plan delivery while acquiring greater insight into how students and teachers are performing. Schools and teachers will gain a more streamlined lesson-plan workflow and have a better understanding of what their students are actually learning. Publishers of educational materials will gain a new standards-based marketplace for their products, new opportunities to up-sell into higher-value content, and analytics that will better inform their product-development and marketing decisions. Parents will have real-time access to class curriculum and to their children's performance, making them more engaged participants in their children's education. And students will gain access to rich, immersive content delivered on the devices they want to use with the ability to share, annotate and collaborate, all the while maintaining a permanent record of their learning.

This white paper details a three-way partnership that brings service provider network assets and subscriber business models together with core Alcatel-Lucent technology components and LearningMate's GoClass teaching and learning application to deliver a potent digital content and workflow platform with clear benefits for every stakeholder in the educational marketplace.

PROPERLY IMPLEMENTED TECHNOLOGY SAVES MONEY

The education sector in the United States is a huge marketplace. According to the U.S. National Center for Education Statistics, there were 50 million kindergarten to Grade 12 students[1] enrolled in almost 100,000 public schools in 2012, and another 19.7 million students[2] in about 4,400 degree-granting institutions of higher education. Per-pupil expenditure on public elementary and secondary students was $10,499 in 2009[3], according to the U.S. Census Bureau.

Developing and implementing digital teaching resources would deliver significant advantages over the paper-based approach that is the current standard practice across most of the K20 education sector. In Project Red, which studied the impact of technology implementation in American schools, it was estimated that cost savings from reduced paper

[1] U.S. National center for education statistics as cited in the statistical abstract of the United States: 2011, table 215.
[2] U.S. National Center for Education statistics as cited in the statistical abstract of the United States: 2011.
[3] U.S. Census Bureau, public education finances: 2009.

use alone could total $739 million a year just for high schools. Further savings would be derived from the re-engineering of educational systems to optimize cost effectiveness, a more effective use of educational materials, and the elimination of duplicate and redundant systems and processes. Most critically, Project Red suggested that the broadest financial impact of the proper implementation of technology could be through reduced dropout rates, estimating that "the aggregate positive financial impact … after 40 years of changed schools would be … three trillion dollars a year."[4]

Meanwhile, stakeholders want education resources to be richer, more interactive, and socially connected. Moving from data-poor manual teaching workflows to a digital model will deliver improved accountability data and education-process analytics so that both student and teacher performance can be measured in a more accurate, real-time and meaningful fashion.

Mobile is promising, but challenging

The education sector is a complicated marketplace of countless diverse players at the federal, state, local education agency and even individual institution level. Additionally, it is a sector uniquely governed by standards and pedagogical concerns intended to ensure consistent, evidence-based outcomes. Because of these and other factors, the adoption of technology into classrooms has gone far more slowly than in other sectors. Although the U.S. education and healthcare sectors are roughly equivalent at about $1.2 trillion in annual spending, IT expenditures are 10 times higher in healthcare than in education, according to a study by BCG Perspectives.[5]

The adoption of mobile technologies into the classroom has significantly lagged other sectors, notwithstanding the considerable promise that mobile holds. Handheld devices, the applications that run on them, and the network infrastructure that supports them are delivering proven benefits in many other areas of the economy, and the education sector is keen to reap the same. Funding bodies at the federal and state levels have recognized this, and there are several new initiatives that support the broader adoption of mobile technologies.

Even where mobile has been embraced, however, significant challenges must be overcome. When students bring their own devices to school, network infrastructure cannot handle the increased load, and network crashes occur. Schools have the usual concerns of security and maintenance when it comes to the use of networked devices by their students, along with distinct issues such as ensuring an equitable playing field for all students and being able to determine that students are following lesson plans rather than surfing elsewhere.

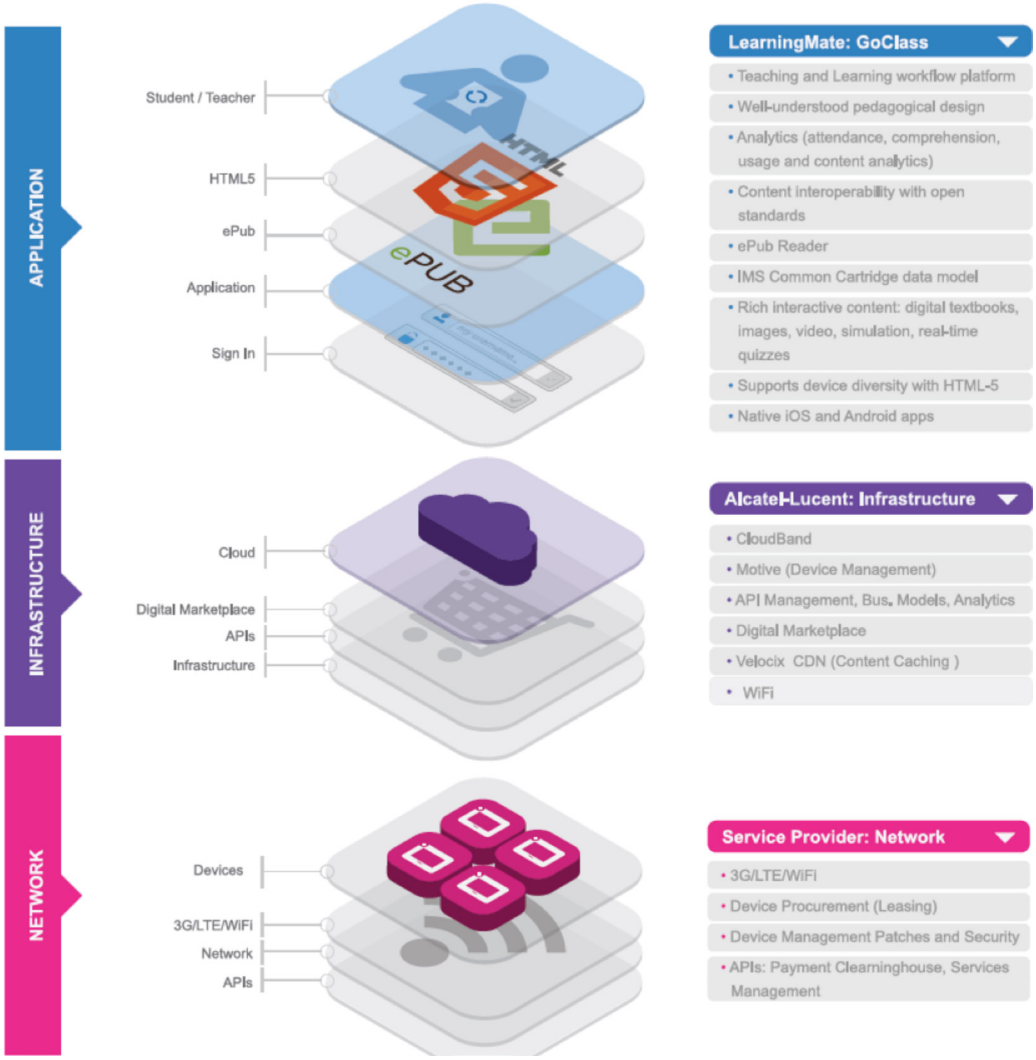
SOFTWARE + HARDWARE + NETWORK = OPPORTUNITY

This opportunity is realized through a three-way partnership that brings service provider network assets and subscriber business models together with core Alcatel-Lucent technology and LearningMate's GoClass teaching and learning application to deliver a potent new digital content and workflow platform for education.

[4] Greaves, T., Hayes, J., Wilson, L. and Gielniak, M., *The Technology Factor: Nine Keys to Student Achievement and Cost-Effectiveness*, The Greaves Group, The Hayes Connection, One-to-One Institute, 2010

[5] Bailey, A., Henry, T., McBride, L. and Puckett, J., *Unleashing the Potential of Educational Technology*, BCG Perspectives, 2011.

Figure 2. Technology



What is GoClass?

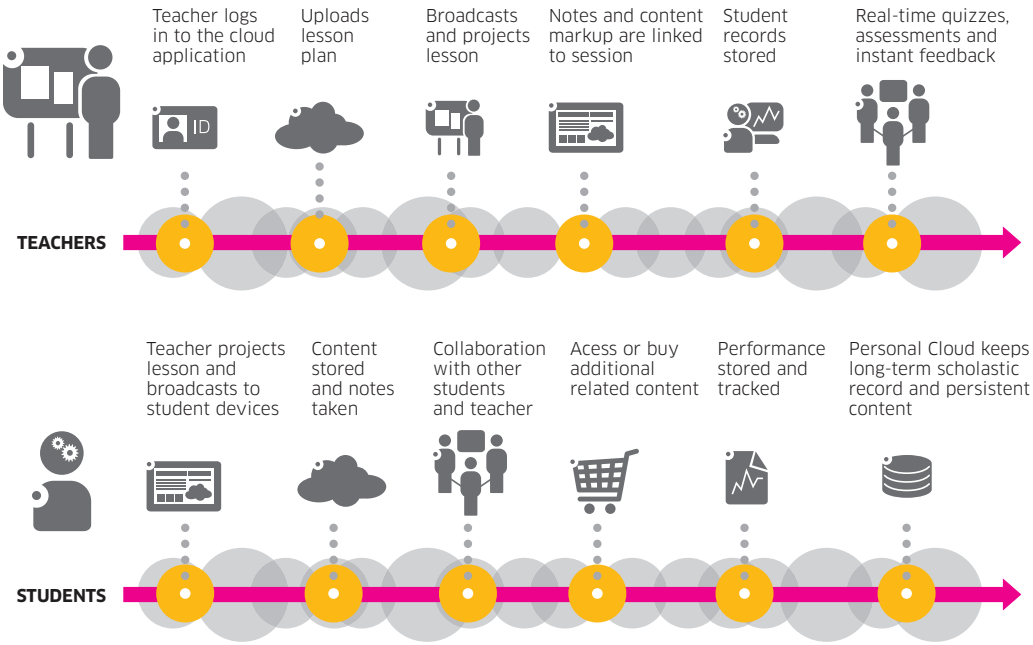
LearningMate's GoClass is a subscription-based, teacher-centered, classroom workflow-management application. Teachers use GoClass to develop and store lesson-plans in the cloud. In the classroom, they project those lesson-plans at the front of the room and broadcast them to students' mobile devices. Students can save content in their own accounts, and can annotate that content and collaborate around it with classmates. They can also access or buy additional related content. GoClass links students notes and annotations to the related lesson plan element by design. Students can elect to share this work with their teacher and can also collaborate with other students working on the same material.

Real-time quizzes, assessments and other forms of instant feedback provide immediate measurements of how well students are learning the material, allowing teachers to rapidly amend their lesson plans and provide highly personalized help to students. All of these performance metrics are stored within GoClass, providing teachers and schools with meaningful accountability data and a foundation for insightful education-process analytics. Students maintain a personal, cloud-based record that holds long-term scholastic records and persistent content.

GoClass employs a lesson-plan content model that is already familiar to teachers. All lesson-plan elements are correlated to curriculum standards, allowing for automated reporting of curriculum completion and for individualized recommendations for each student. GoClass adheres to established pedagogical approaches with its “Show, Explain, Ask” approach to presenting content and testing student comprehension.

GoClass is a cloud application with platform-specific clients for iOS and Android devices. The GoClass client is also available as an HTML5 application for WebKit browsers.

Figure 2. GoClass



Alcatel-Lucent technology blocks

Alcatel-Lucent brings to this partnership an array of technology products that make it possible for service providers to provision and manage this new education-sector offering while building a platform for future education technology.

Digital Media Store is an end-to-end hosted and managed service that maintains a digital library of all digital content, including both approved state curriculum content and custom content created by teachers for use in their day-to-day lesson plans. Through DMS, students and parents can purchase additional material not funded by schools or the state.

CloudBand brings together the computing power and flexibility of the cloud with the high performance, reliability and security of communications networks. CloudBand will be used to create teacher and student accounts and will, for the first time, give parents complete access so they can see and track what’s being learned. With CloudBand, each school can have local cloud nodes on each premise. Each cloud node optimizes the delivery of content and communication traffic on the network, while acting as part of the larger distributed cloud that remains available to take on excess capacity.

Motive is a device-management software that facilitates the distribution of devices for each student, ensures set-up of applications being used on the device, maintains security and appropriate patches for each device, and remotely retrieves diagnostic information from devices to enable operators to access and update vital configuration settings in real time. Lost devices can have their contents remotely erased, safeguarding student privacy and security. With many schools embracing a "bring your own device" policy, it's critical that service providers have the ability to manage a wide range of devices.

OpenAPIPlatform is an end-to-end API management and optimization software solution that will support the required billing infrastructure, allowing for segmentation between school-funded material and content that students and parents will purchase independently.

Velocix is a content delivery network that enhances network efficiency and improves user experience through intelligent, hierarchical content replication based on dynamic demand patterns. All video content used by each school is centrally cached for more efficient and lower-cost network delivery.

The Service Provider role

Service Providers have the network infrastructure and the customer-facing subscriber, device leasing and customer-care models that, together with GoClass and Alcatel-Lucent's technology, allow them to create this new digital teaching and learning platform and market it to the education sector as a one-stop, fully integrated, enterprise-grade offering.

Service providers would deploy new, robust network infrastructure within schools and lever existing or new network assets in communities to deliver GoClass across WiFi, 3G and 4G-LTE. To ensure that every student has equitable access, mobile devices could be paid for through available federal and state funding programs or through cost savings realized by schools and education departments. Where these aren't available, service providers can buy the devices and lease them to local education agencies or to individual students.

Service providers already have the necessary subscriber and billing infrastructure, as well as store-based customer-care facilities where user accounts can be managed and devices can be serviced.

THE CONNECTED CLASSROOM

Service providers adopting the connected classroom concept are uniquely equipped to change the education experience for the next generation of K20 students from kindergarten all the way through college, creating high-value benefits for every stakeholder.

Departments of education will be able to capitalize on funding from federal and state programs designed to encourage the appropriate adoption of new technology into classrooms. They will reduce costs by replacing paper-based models with digital textbooks and lesson plans. The GoClass Cloud application will generate potent new data streams that will give education departments greater insight into how students, teachers and schools are performing. Technical infrastructure can be managed as an annual operating expense versus a capital expense.

Schools and teachers will gain a more streamlined lesson-plan workflow. They'll have more accurate and more immediate measurements of student comprehension, and will be able to provide more individualized levels of teaching. Attendance records, curriculum achievement reports and many other key data points will be automatically generated.

Students will gain access to rich, immersive content delivered on the devices they want to use. Formal lesson plans can easily be supplemented with both free and paid-for additional rich content. Students will benefit from a more engaging learning environment where they can share and collaborate with peers, and annotate and personalize content. And they will build and maintain a permanent record of their learning.

Parents for the first time will have direct insight to the class curriculum for their child, and will have real-time access to their child's performance data. This will make them more engaged participants in their child's education.

Publishers of educational materials will gain a new standards-based marketplace for their products. Opportunities to up-sell subscribers into higher-value content will be automated. Content usage analytics will better inform their product-development and marketing decisions.

Service providers gain a new, high-value service they can market to tens of millions of new subscribers. The comprehensive, enterprise service model makes for long-term, highly sticky subscriber relationships. Access to available federal and state funding could help overcome some of the cost barriers to digital curriculum adoption.

CONCLUSION

The education sector is overdue for the technology-driven user benefits and cost efficiencies that most other sectors of the economy have long been enjoying. The challenges and complexities of selling into this large but complicated marketplace are mitigated by the availability of significant public funding for technology adoption, a growing clamor by education stakeholders for more streamlined and effective processes, and advances in the understanding of how technology, properly and equitably implemented, can create richer and more engaging teaching and learning environments without changing existing pedagogical processes.

Alcatel-Lucent technology assets come together with LearningMate's GoClass teaching and learning application and the network assets and subscriber business models of service providers to create the connected classroom solution. This is an unprecedented opportunity for service providers to meet the digital needs of today's students and teachers.

For more information about the educational platform that is being developed in joint partnership with Learning Mate and Alcatel-Lucent contact:

Debbie Bradshaw
Application Enablement
Alcatel-Lucent
Debbie.bradshaw@alcatel-lucent.com

Mohit Bhargava
President, LearningMate
Mohit.bhargava@learningmate.com

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