Lower TCO, Better Experience:
Chromebooks in the Classroom

SPONSORED BY

(intel)

lenovo® FOR THOSE WHO DO.

School districts and education agencies facing the double burden of increased mandates and wider budget cuts know that leveraging innovation is mandatory—every dollar saved is an opportunity to invest elsewhere. IT must find ways to deliver transformational solutions that are strategically sound and comprehensively reduce costs over time.

Organizations looking to reduce technology costs typically look for ways to reduce the Total Cost of Ownership (TCO). When properly analyzed, TCO captures all direct and indirect costs related to acquiring, configuring, deploying, managing and retiring a particular asset or system. Each one of these categories is a valuable opportunity to save money, improve IT and increase engaged learning.

TRANSFORMATIONAL TRENDS TO THE RESCUE

Strategically deploying technology is never easy, especially inside K-12 organizations. Budget uncertainties and the rapid pace of change in IT and education makes decisions difficult, with the next big thing quickly becoming yet another legacy system to be sustained in perpetuity.

When CDW asked K-12 IT professionals to predict how much of their budget they would be allocating to the cloud over the next four years, the average answer was 35%.

Smart transformation is about integration. Choosing a single vendor or proprietary protocol may solve short-term issues at the expense of costly long-term complexity. Integration also allows iterative change, slowly updating systems as budgets and other circumstances allow. This empowers innovation while preserving mission-critical interoperability.

INNOVATION OVERHEAD: THE CLOUD

Cloud computing has been an obvious choice for districts and agencies looking to consolidate, virtualize, and modernize. While most of them have been cloud consumers for quite some time via SaaS applications, many IT organizations are now looking to explicitly formalize their cloud initiatives. When CDW asked K-12 IT professionals to predict how much of their budget they would be allocating to the cloud over the next four years, the average answer was 35%.[1]

K-12 technology is increasingly shifting to the cloud for mostly the same reason everybody else is: lower cost and better access. By virtualizing computing and storage needs on the back end, organizations can reduce their reliance on expensive application and data centers. Developing applications inside the cloud also greatly reduces the cost of development and deployment.

On the front end, the cloud simplifies the delivery of important services and information. Thin, typically browser based clients, manage access. Whether it's a standalone SaaS tool like email or an integrated suite of cloud apps, the user experience is delivered via standardized, easy to use interface. The Chromebook™ is essentially a **"super client"** for this new cloud offering of educational apps and rich content.

1 CDW, "Silver Linings and Surprises: CDW's 2013 State of the Cloud Report"

THE CHROMEBOOK IN THE CLASSROOM

As organizations move their important infrastructure into the cloud, they are also re-examining the devices used to access those systems – especially as 1:1 learning initiatives increases the installed base of equipment. While everyone agrees the traditional desktop PC is being replaced by more mobile, portable devices there is no consensus on a suitable, cost-effective alternative.

Lenovo's ThinkPad® X131e Chromebook powered by 3rd Generation Intel® Core™ technology may be the answer. It is the ideal mix of performance, durability and portability, a cost-conscious solution that extends the reach of education well beyond the classroom. The ThinkPad X131e was designed with ruggedized features such as stronger hinges and hinge brackets, customizable security features and spill-resistant keyboard, and shock absorption from Active Protection System™ (APS) for student handling. Built around the Google Chrome OS and an optimized set of browser-based applications and tools, Chromebooks reduce TCO, modernize infrastructure, and improve the student experience.

By focusing on the cloud core functionality, the Chromebook's form nearly matches its primary function: liberating students and IT from the high costs and narrow reach of traditional educational technology.

Chromebooks benefit learners, teachers and administrators. Students get easy anywhere access to their work with built-in Google apps and services, and IT gets easy manageability. No software to push, no applications to secure, and very little opportunity for creative re-configuration by users and balances content creation with content consumption.

THE NEW POTENTIAL: CHROMEBOOKS IN THE CLOUD

Unlike traditional laptops, netbooks, or tablets – the Chromebook is built for the cloud. It combines the efficiency of a thin (browser) client with hardware and software specially optimized for mobile productivity. By focusing on the cloud core functionality, the Chromebook's form nearly matches its primary function: liberating students and IT from the high costs and narrow reach of traditional educational technology.

THIS BRIEF

This paper looks at how districts and agencies can lower their costs and improve student and teacher access to relevant technology tools through cloud-based Chromebook computers. It discusses current budget and technology constraints, the importance of understanding Total Cost of Ownership (TCO), and how Chromebooks in the Cloud can reduce TCO without sacrificing performance or achievement.

IMPORTANT MATH: UNDERSTANDING TCO

Is TCO the metric for evaluating long-term technology choices? Yes and no. Since introduced by Gartner in 1998, TCO has become the standard methodology for evaluating long term enterprise technology costs. It includes all costs, direct and indirect, over the service life of a particular asset.

However, useful as TCO and similar methodologies are for evaluating products and solutions, they are not by themselves the way forward. Ultimately, mission matters. Cutting costs reducing the quality or availability of delivered learning isn't acceptable. IT must identify ways to reduce costs that don't negatively impact usability and achievement.

K-12 technology faces unique challenges. Educational systems, from network to desktop to mobile devices, are typically more complex similarly sized private sector enterprises. New ideas, which even in pilot mode can complicate things dramatically based on scale, can't always be evaluated for long-term interoperability going forward.

This complexity presents a tremendous opportunity to reduce costs through consolidation and

virtualization. But, once again, mission matters. IT teams are tasked with finding solutions that deliver efficiency on the back end while still enabling legacy systems and other specialized technology needs. This allows districts and agencies to achieve smart transformation that balances the ability to innovate with the need to sustain.

BY THE NUMBERS: WHAT'S IN TCO?

TCO goes beyond purchase price to comprehensively examine all costs from purchase price to the cost of taking an asset out of service.

DIRECT (BUDGETED) COSTS:

- **Purchase:** hardware and software
- **Deployment:** configuration and installation
- **Operations:** upgrade and support
- **Disposal:** retirement and repurposing

INDIRECT (UNBUDGETED) COSTS:

- **End User Costs:** training and education
- **Availability:** down time and productivity

While direct costs are easy to quantify, non-budgeted indirect costs are much harder to predict. According to Gartner, these indirect costs are often 60% of total TCO over lifecycle, that means some potentially very expensive surprises down the road.[2] It can also mean much lower TCO if those costs can be understood and mitigated.

IMPACTING TCO

Typically, organizations looking to reduce TCO buy cheaper devices, support them less, or extend their lifecycle. Unfortunately this can lead to down time, decrease in learning outcomes and increased TCO due to repair and the purchase of replacement devices. The smarter approach looks for solutions that reduce direct costs up front but also produce opportunities for sustainable cost reduction and avoidance going forward. It

requires a deeper dive during the decision making process but ultimately yields better results.

The direct cost of the Chromebook line is attractive – much less than traditional PCs.[3] The Cloud also has immediate direct cost benefits, once implemented, due to its consolidated infrastructure. The two solutions combine to also drive down indirect costs.

EDUCATION GRADE RELIABILITY AND AVAILABILITY

For all the attention paid to military specifications on durable technology (MIL-STD 810), education can also be a punishing deployment for laptops, and other devices. Long hours, lots of use, and the occasional accidental drops and rough handling. Lenovo's ThinkPad X131e Chromebooks are powered by 3rd generation Intel® Core processors and equipped with Intel's Education Software specialized applications for personalized eLearning, classroom management, and IT. It is built for heavy use inside and out, with traditional, spill resistant keyboard and an OS that can lock down sites, applications, and permissions as required. And comes with protective bumpers, stronger hinges and hinge brackets for student handling.

The Chromebook is also the ultimate "super thin" client, allowing students to sign into any available machine and get right to work. K-12 school systems found Chromebooks required 92% less labor to support than traditional PCs or other portables.[4] The Google OS and apps are self-contained and need little maintenance (and are not easily exploited), and push updates eliminate compatibility issues.

According to IDC:

- Direct purchase costs are less than 20% of total TCO

- Direct deployment and operations costs are approximately 20% of total TCO

- Unbudgeted and indirect end-user and downtime costs are approximately 60% of total TCO

2 Gartner, "Desktop Total Cost of Ownership: 2011 Update"
3, 4 IDC, "Quantifying the Economic Value of Chromebooks for K-12 Education"

Cloud services give you redundancy not easily achieved in most local data centers, as well as automatic backups, and protection against viruses and malware. Chromebooks are also optimized for long battery life - making them ideal for use in labs, at home, or an active classroom. Worried about the ability to work offline when internet connectivity is unavailable? Chromebooks and Google content along with many applications, including mail and documents are available offline, in some cases with reduced functionality.

SUPERIOR MANAGEABILITY

Once a device is purchased, management begins. It starts with provisioning, imaging, and putting the device on the network and also includes securely keeping the device, OS, and applications updated, upgraded, patched, and protected. Each new configuration is a new variable to be managed, making complexity very expensive.

How devices are managed also heavily impacts TCO. Enterprise-strength manageability features help contain some of these costs by empowering easy, consistent, and intelligent device management. A well-managed device performs better, for longer, and more securely. According to Gartner, the TCO for a well-managed device can be 40% lower than a similar device left unmanaged.

Chromebooks require little to no major maintenance. Applications are automatically and transparently updated. All Chromebook management is performed through a single console – everything from provisioning to security. There are no application or database servers to maintain – no logs, no backups are required to be managed. All of that information and functionality is available, all you have to do is consume it.

THE POWER OF FAMILIARITY

TCO's *end user costs* reflect both the price of downtime as well as the cost of educating users on systems, applications, and operation.

Steep learning curves increase frustration and increase training and development time for teachers and even for tech-savvy students. Users either seek help through official support channels or turn to their peers for assistance.

By leveraging popular applications, common interfaces, and intuitive concepts, consumerization reduces the need to train students and teachers on new technology. Learning curves and the need for support are both reduced, as students hone their own expertise in already familiar technology. Consumerization has another benefit that TCO may or may not capture: enthusiasm. By delivering applications and devices that already market-proven, districts and agencies can take advantage of a general interest in trends and technology to make the line between life and learning very transparent.

By focusing on the cloud core functionality, the Chromebook's form nearly matches its primary function: liberating students and IT from the high costs and narrow reach of traditional educational technology.

The power of the Google brand is undeniable, and the popularity of their enterprise application suite is growing in both the private and public sector. For most students and teachers, Google is a familiar email, calendar, contacts, or collaboration app. The ability to take that into the classroom is a huge advantage, especially when it also reduces costs and simplifies IT.

The recent discussions around "Bring Your Own Device (BYOD)" policy are ultimately also about consumerization. IT either deploys solutions or users choose their own and IT spends their time managing the battle. Chromebooks and the Cloud represent the ideal balance, which leverages the consumerization's upside while keeping information and systems reliable.

ASSESSING RISKS

For most systems, a distributed Chromebook deployment is a fairly radical change. As the solution continues to scale up, IT professionals often share very similar concerns – mostly centered about security, scalability, and resources.

Security

Security concerns around the distributed nature of the cloud consistently ranks the #1 biggest concern of those considering a cloud solution. Google applications wrap all between the browser and the data center transimissions in "Secure Sockets Layer (SSL)", encryption to keep your information secure over the Internet. Once there, your data is well protected and readily accessible.

Scale

Some systems are too diverse to support a large move to the cloud – there are simply too many legacy systems and specialized solutions like processor-heavy design or calculation computers. Some of these are back office functions not directly related to student learning. Student and teacher-facing applications that simply must be sustained can be – Chromebooks can be deployed elsewhere with no need for an all or nothing adoption.

The ThinkPad X131e Chromebook with its ruggedized design for K-12 succeeds because the innovation is closely functioned on what learners and teachers need - instant access, easy collaboration, and intuitive tools.

Resources

While Chromebooks are efficient, they can also put a strain on networks without proper preparation. A new deployment can quickly overwhelm an unprepared network with traffic between students, teachers, and applications. Districts and agencies should carefully evaluate their network capacity before deploying. Students also need reliable Internet access at home.

A NEW WAY FORWARD

Schools systems intent on preserving important technology dollars have options. They may try to reduce costs on existing infrastructure, restrict access to important resources, or avoid spending elsewhere. They can also look for ways to strengthen efficiency through smarter, more strategic investments like the Chromebook and other moves towards modernization.

The ThinkPad X131e Chromebook with its ruggedized design for K-12 succeeds because the innovation is closely functioned on what learners and teachers need – instant access, easy collaboration, and intuitive tools. Its lean OS, easy management, and distributed storage make it a good decision for IT as well. It manages to provide a better experience, with less time to task and support. Does it all really pay off? Over three years, research shows that the Chromebook will cost up to $1000 less than traditional alternatives.[5]