MANAGING TOTAL COST OF OWNERSHIP FOR EDUCATIONAL TECHNOLOGY

White Paper: Examining the importance of Total Cost of Ownership (TCO) and how to evaluate TCO for various software solutions
Introduction

What is Total Cost of Ownership?

According to the Consortium for School Networking (CoSN), Total Cost of Ownership (TCO) is a concept developed in the late 1980’s designed to provide insight into the real cost of computing.

Rather than looking solely at the IT capital and operations budget, TCO also considers other indirect or non-budgeted costs as well. TCO analysis provides costs and metrics on a per-client-computer basis.

The TCO approach takes the following into account:

- Amortized equipment costs for technology – including client computers, servers, network equipment, printers and other hardware; software; and external service providers
- Direct labor – the established support infrastructure as well as others who support users and the computing infrastructure
- Indirect labor – time costs incurred by user training, productivity losses experienced when problems occur, or time lost when a device fails or network connectivity is lost

A thorough assessment of TCO can provide a school or district with a much clearer view of its technology infrastructure’s true cost. The assessment can also provide budgeting assistance, as per-client-computer costs can be dependent on factors such as district size and complexity of the computing infrastructure. Therefore, direct comparisons across districts or campuses are not always effective.

When exploring ways to determine TCO, organizations’ technology leaders may encounter a slightly different concept known as Value of Investment (VOI). While the two measurements are similar, VOI has a narrower focus, projecting the costs and related benefits of specific technology initiatives. A TCO assessment focuses on understanding all the costs incurred for a distributed computing environment for a school or district.
A broad view of TCO needs to be established and understood to optimize the costs of technology, direct labor and indirect labor. To develop this, a baseline TCO assessment of the entire organization (district, campus or independent school) should be performed, then updated annually. A TCO assessment can help point out operational and infrastructure weaknesses that can be strengthened. While this may involve a significant amount of data collection, the results can make it well worth the effort. Establishing a TCO baseline can point the way to efficiencies, highlight potential trouble spots and help schools better plan for the future.

**WHY IS TCO IMPORTANT?**

Although cost reduction and control is important, it is not the only factor to consider when determining TCO. While a low TCO may be desirable, if it is accompanied by low customer satisfaction or is created by limiting access to technology resources and services, the end result does not justify the lower TCO. For example, the TCO for Internet access might be low because the school system severely restricts the time that Internet service is available and limits the number of users per school. Students and faculty become frustrated because this limited access disrupts their ability to meet instructional or management goals. Conversely, a higher TCO for Internet service would be acceptable if it meant access was available to students and staff for instructional activities and a better learning environment. As this example shows, a higher TCO can be justified by its impact on student achievement and improved efficiency in operations.

Calculating your TCO is the first step. Costs and expenses for TCO can be broken down into several categories:

**INITIAL INSTALLATION**

Any technology installation will have costs involved with purchasing and installing hardware and software. Some of these include coordinating the logistics of deploying the hardware and software to schools and other facilities, the actual time spent on installing the hardware, software deployment to the newly installed hardware, and establishing connectivity between newly installed equipment and existing infrastructure.

Other less obvious, but equally important, items include:

- Upgrading a building’s electrical capacity to handle the increased power requirements
- Improving heating, cooling and ventilation systems to ensure an optimal operating environment
- Strengthening building security to protect an organization’s technology investment
- Asbestos and lead abatement in older buildings
- Modifications required to comply with the Americans with Disabilities Act
- Adding the newly installed technology into the school’s inventory management system

The best time to deal with these items is during a building’s construction or expansion, but in the case of retrofitting older facilities, the costs can be significant and must be considered as part of TCO.
DIRECT LABOR COSTS

Direct labor includes everyone who is involved with the implementation and support of computer and network technology. This includes computer-services management, purchasing, planning, project management, training, development, help-desk and end-user support.

Direct costs are those that are visible and commonly understood. The technology support group generally incurs these costs, as they provide formal or “official” support. After computers are installed, a school will need people to help maintain its network and other hardware and help users solve problems they encounter with their computers and software packages. The number of support staff required will depend on several variables, including the number of workstations, the variety of operating systems, and software applications that must be supported.

INDIRECT LABOR COSTS

Indirect costs are incurred by the end user community and are generally “hidden.” They result in lost productivity or instructional time. Indirect costs are driven by the labor time associated with the following types of activities:

- **Peer Support**—The time spent by users asking questions of other users and the time spent by users responding to questions such as, “How do I print to a different printer?” or “How do I find the online directory?”
- **File and Data Management**—Time spent by users trying to free up space on local disks or network drives.
- **Downtime**—Idle time spent by users because the network or their computer has stopped functioning.

**INDIRECT COSTS**

**TYPICAL LABOR TIME**

Indirect labor is typically performed by students, teachers, aides and nonteaching staff. It reflects the time users spend in training, dealing with their own or other users’ IT issues, and in lost productivity when the system or network is down. Particularly in school settings, technology-savvy faculty and even students spend time providing informal support when problems occur.

While these costs may be considered “soft,” they are an expense to the school or district. They also measure the value provided by the formal technology support
organization. According to one measurement, indirect costs can contribute as much as 60 percent to overall TCO.

When compared to a typical business environment, schools generally have significantly less formal support. When a school network loses connectivity, faculty is expected to go back to teaching “the old fashioned way” until it is fixed. If a classroom computer malfunctions, students are forced to share the computers that are still working. With the ever-increasing reliance on technology in the classroom, the impact on student learning is substantial, and these costs must be accounted for when calculating TCO.

Although indirect labor is not reflected in the technology or school budget, it is real time spent by professionals that could be spent elsewhere (such as writing lesson plans or curriculum development) and is a real cost to a school or district. Reducing this time by providing current technology and responsive support to end users is an important TCO consideration. Indirect labor data has the most value when it is obtained directly from the users, through a survey or focus group.

**INFRASTRUCTURE & MAINTENANCE**

Some associated infrastructure costs include deploying and maintaining centralized servers to provide access to hosted software, ensuring sufficient software licensing and compliance with license requirements, upgrading hardware to meet increasing demands for speed and data storage, and upgrading software to improve performance and utilize new features.

One method of reducing this expense, which has become widely accepted in recent years, is the use of Software as a Service (SaaS), also known as cloud computing. With SaaS, schools are relieved of the burden of purchasing, installing and supporting hardware, as the software provider manages this from a central location. Upgrades are deployed by the software provider, reducing the time and expense involved at the district or school level. Software enhancements are typically delivered more frequently, with little to no user downtime. Applications are often licensed for a period of time, rather than purchased outright, giving institutions’ flexibility by not binding them long-term to an expensive in-house system.

SaaS applications are typically accessed via a web browser, resulting in a shorter learning curve for end users. Along with providing a familiar look and feel, end users can access the application from any location with internet access, resulting in greater satisfaction. Although cloud solutions offer less hands-on control of the application, this should be weighed against the advantages and substantial cost savings.
USING SAAS TECHNOLOGY TO REDUCE TCO

SaaS solutions can reduce TCO in a variety of ways, including:

CAPITAL EXPENSES

For locally hosted applications, software and hardware, network infrastructure enhancements, monitoring and testing tools, security products, supplies, facilities and other required infrastructure are all part of a typical capital acquisition expenditure, paid up-front.

Most SaaS models have a recurring cost structure, involving a monthly or annual service fee for as long as the service is used. This service fee typically includes maintenance, support, training and upgrades and is inclusive of all hardware, networking, storage, database, administration and other costs associated with SaaS delivery. This typically results in substantially less capital outlay than the up-front expense of in-house applications.

DESIGN AND DEPLOYMENT COSTS

Labor needed to research, design, integrate, test, tune and launch is a significant cost associated with deploying an in-house solution. End user computer hardware, operating systems and applications have to be evaluated for compatibility with the selected server product and upgraded if necessary. System testing and tuning are necessary to make sure performance is acceptable for launch. Required training for end users and IT staff, launch activities, and pilots all require IT resources.

Cloud-based applications can usually be deployed and put into production much faster and for a fraction of the cost compared to a traditional software solution.

ONGOING INFRASTRUCTURE COSTS

Network monitoring and management tools are often required to enable real-time problem diagnosis with in-house solutions. Yearly software maintenance, support contracts and system upgrades are a significant part of TCO. The need to add capacity over time, have redundant systems and build add-on features further increases costs.

Other than additional Internet bandwidth needs, there are almost no incremental infrastructure costs to handle the growth of a cloud-based application.

ONGOING OPERATIONS, TRAINING AND SUPPORT COSTS

Schools’ IT organizations will have to allocate resources for monitoring, supporting and maintaining a locally hosted application. The IT organization will also be responsible for monitoring and maintaining the application as well as troubleshooting the application in case of downtime. In addition, every time a patch or upgrade needs to be deployed, additional IT resources will be required.

Initial and ongoing training and support are critical success factors in the adoption and ongoing use of an application. With most traditional software applications, an internal department is tasked with the initial and ongoing end user training. If end users have problems, this can lead to a loss in productivity or even a refusal to use the application at all. User issues typically grow with usage; therefore, the support load needed in the IT organization grows as well.
SaaS vendors are responsible for the end-to-end delivery of their application. As a result, SaaS vendors have a vested interest in seeing customers widely adopt and use the application. Due to this, almost all SaaS vendors focus on making their products easy to use and offering initial and ongoing training and support for all users.

THE “BREAK-EVEN” POINT?
A common argument for “owning” software has been that even with higher upfront costs, there is a break-even point where traditional software becomes cheaper than the SaaS subscription model.

An analysis by noted research firm IDC reviewed several SaaS versus traditional software deployments and found that when human resources and upgrade costs are correctly taken in consideration, this break-even point may never be realized.

SOME STARTLING NUMBERS...
In a recent survey of educational technology professionals, 88 percent of school systems indicated they were very familiar or somewhat familiar with Software as a Service (SaaS) as a delivery model. Fifty percent were using at least one SaaS-based application. The same survey identified several obstacles which many school technology officials face:

- More than 70 percent indicated they have inadequate staffing to integrate technology into the classroom and implement new technologies into their schools.
- More than 75 percent of survey participants indicated their IT budget was less than they needed to meet the expectations of the school board and district leaders.
- Seventy-one percent thought that their IT budget was less than needed to support existing computer assets.

Implementing low-cost, low-maintenance cloud solutions can bridge this gap and provide new technology without further taxing overextended technology departments and lowering TCO.

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70% staff unable to integrate classroom technology
75% budget cannot meet expectations of board & leaders
71% insufficient budget to support existing tech assets

SECURITY CONCERNS

Hardware in any location is subject to security issues. This can range from vandalism to intentional acts of malice. Many organizations have experienced major network outages due to a disgruntled employee or a malicious individual. Most educational institutions have little to no protection from this form of catastrophe. Today, most SaaS providers employ protection and security far exceeding that of most Fortune 500 companies and government agencies. Look for the following criteria when considering SaaS security concerns:

- Physical security monitoring 24x7x365
- IDS/Network security monitoring 24x7x365
- Application security by unique username and password or via claims based single sign-on
- Annual security audit by third party security consultants
- Industry standard antivirus software for all systems that are monitored and updated daily
- Patch management process to evaluate, test, and apply patches as needed when released by vendors
- Regularly scheduled disaster recovery drills

Your software applications should be managed in a secure and reliable environment with support and services from a technology partner that knows educational institutions. Only authorized personnel should be allowed in the facility, which is secured by a sophisticated, biometric security system.

RESULTS OF TCO ASSESSMENTS

Once an institution’s assessment is complete, the final numbers provide a useful way to look at TCO data and metrics. According to CoSN, results can be categorized as follows:

Total Costs are a summary of direct and indirect district and per-client computer costs. Both total cost and per-client computer costs are shown. There is a breakout of direct costs and indirect labor costs as well as a breakout of direct costs by hardware, software, direct labor and external application providers.

Asset Metrics show the pervasiveness of client computers broken down by user (student-available, faculty-dedicated and non-classroom staff) and by infrastructure (client computers per server and per printer).

Asset Cost Metrics break down direct annualized technology costs, including client computer, network, server, printer and hardware, plus supplies.

Direct Labor Cost Metrics provide an overview of labor costs by end user function (such as direct labor cost per faculty member and per student) and a direct labor staffing breakdown by computer services, faculty, other staff, outsourced labor, students and volunteers.
Direct Labor Staffing Metrics illustrate the number of client computers supported per support staff; average direct labor support-staff costs by technology staff, teachers, aides and non-classroom staff; and a breakdown of percent of staff in each of these support categories.

Once this data has been collected, an educational institution will be in a much better position to determine the overall TCO of their technology infrastructure.

REDUCING TCO WITH SCHOOLDUDE’S CLOUD PLATFORM

SchoolDude clients typically save an average of 70-80% over 5 years compared to other systems by using cloud-based solutions that reduce a school’s TCO in several areas:

TECHNOLOGY MANAGEMENT

In order to determine and control technology costs, management tools are needed to organize workflow and user support, and to administer technology assets. SchoolDude offers solutions to assist with technology management:

ITDirect
An IT help desk management solution that streamlines the entire technology workflow process from support request to resolution. An efficient IT help desk ticket system is the first step in maintaining a high level of customer service and justifying staff and budgets.

ITAMDirect
An IT asset management solution that streamlines all aspects of IT administration, including asset discovery, monitoring, inventory, and auditing of hardware assets and software licenses.

ENERGY MANAGEMENT

Energy costs affect every aspect of school operations, including the technology infrastructure. SchoolDude’s cloud-based solutions provide districts with tools to manage and reduce energy consumption:

UtilityDirect
An energy management and utility tracking solution that tracks, audits and analyzes utility consumption and costs to identify savings opportunities. Coupled with a strong conservation program, UtilityDirect makes it easy for your school to save money on rising energy costs.

ConserveDirect
An energy management solution that integrates with UtilityDirect and ENERGY STAR® to provide detailed information about your ENERGY STAR ratings, greenhouse gas emissions and monitoring conservation and consumption programs.
MAINTENANCE MANAGEMENT

Efficient and properly maintained facilities are one of the foundations that help institutions maximize TCO. SchoolDude offers the following solutions to assist schools with the management of their facility maintenance efforts:

**MaintenanceDirect**
A work management solution that simplifies the work order process from request to completion. Streamline the entire maintenance management process with the ability to schedule planned maintenance, control inventory items, schedule and coordinate facility usage, and plan for capital needs.

**PMDirect**
A preventive maintenance solution that helps you schedule recurring maintenance tasks and ensures that problems are identified before they become emergencies, saving time and extending the useful life of equipment and facilities.

**PlanningDirect**
A capital planning solution used to forecast facility needs - essential to ensuring that your facilities and maintenance budgets are met every year.

FACILITY USE MANAGEMENT

The use of school facilities by outside organizations can generate significant expense, as well as a wide range of scheduling issues. With SchoolDude’s facility usage solutions, you can simplify scheduling, recover costs, and reduce your energy expenses.

**FSDirect**
A facility usage solution that manages requests from the school and community simplifies the scheduling process and helps you recoup costs. By combining this with schedule automation and community use management, you can simplify your entire event management process.

**FSAutomation**
A solution that integrates and shares data with your building automation system (BAS). Automatically schedule your systems, such as HVAC and lighting, to coordinate with facility usage.

**CommunityUse**
A calendar solution that integrates to streamline the facility scheduling process with outside groups, including facility use requests, invoicing and risk assessment. Take the chaos out of opening your doors to the community while also recouping expenses for supporting events.
CONCLUSION

The value of determining technology TCO comes from analysis of an entire organization’s information on a district or campus level. A low per-client computer TCO in any category is not necessarily good, and a high TCO is not necessarily bad. The real question comes down to determining how effectively computers and networks are being used to meet your institution’s objectives.

Generally speaking, larger schools or districts have a higher total per-client computer TCO than smaller schools. This has to do with the complexity of the networked computing environment and required staffing and management. For instance, if direct labor numbers are low, but indirect labor is high, better end user support may be needed.

Technology officials seldom seek out additional time-consuming projects. However, effort spent determining TCO will allow you to take control of the networked technology environment, understand all the costs, and then develop a comprehensive plan for optimizing organization-wide TCO. A free web-based TCO tool, developed by CoSN and Gartner, can assist with this task. Visit www.classroomtco.org for more details.

ABOUT SCHOOLDUDE

SchoolDude is the market leader in education enterprise asset management. Our cloud solutions help clients save time and money by managing support services effectively and efficiently, allowing institutions to provide a safe teaching and learning environment. SchoolDude is the #1 provider of cloud solutions that helps public and private schools, colleges and universities better manage IT, facilities and business operations.

SchoolDude provides a full suite of solutions for educational institutions to streamline their operations. These include maintenance management solutions to automate the work order process, preventive maintenance schedules, capital planning process and inventory management; event management solutions to simplify facility scheduling and achieve cost recovery from community use of facilities; energy management software for utility tracking and conservation; and technology management solutions to improve the efficiency of the IT help desk and to increase transparency into IT asset hardware and software. SchoolDude’s full suite of cloud-based software provides institutions with a lower cost of ownership, scalable solutions, unlimited support and benchmarks for success based upon data from thousands of schools, districts, and higher education institutions.