

THE WEBVOLUTION'S IMPACT ON VOCATIONAL CLASSROOMS AND ADMINISTRATION

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Abstract: We are eyewitnesses of a Webvolution; a revolution brought about by the explosion of the Internet and the World Wide Web (WWW). Few innovations have been embraced more quickly than the Internet. The current trend of the Internet will change the face of education, as we know it. Almost every public school in the United States has Internet access and other countries are adopting these technologies at a rapid pace. The Internet is perhaps the first truly global environment. This paper will explore the potential of utilizing the WWW as a resource for vocational classrooms and administration. It provides informative information on such topics as: (1) true cost of information technology ownership; (2) using an Application Service Provider (ASP); (3) using the Internet as a communication tool; (4) data security issues; and (5) fundamental changes in the infrastructure requirements of information technology.

INTRODUCTION

Leaders all over the world realize that the most precious natural resource of any country is its children and that technology is key to education [10]. The Internet and the WWW are ubiquitous. In the United State alone, educational institutions are spending billions of dollars on technology in an effort to improve learning and increase productivity. Nearly every public school in America (95%) now has access to the Internet, and the goal is to have every school and classroom connected to the Internet by the end of the year 2000 [17]. Schools all over the world are receiving assistance from a number of organizations and programs in an effort to get "connected". For example, The World Links for Development (WorLD) program has shipped hundreds of computers, resulting from an internal upgrade, to many universities in Africa [5]. Their goal is to have full Internet access to each of the sites. The "Singapore ONE (One Network for Everyone) initiative" plans to develop a nationwide broadband network that will link homes and schools [15]. The WWW is an incredibly vast resource for stakeholders involved in the education progress.

The remainder of this paper presents a framework for discussing the impact the Webvolution can have on vocational education as it relates to classroom management and administration management. It will examine the total cost of ownership (TCO) of information technology. The paper will examine current trends of outsourcing with application service providers (ASPs) in a hosted environment as a means of deploying software applications. It will explore the potential of utilizing the WWW as a resource for "real-time" collecting, organizing, analyzing, and communicating information. Subsequently, the paper will examine security issues as they relate to storing information. In addition, it will examine the impact the WWW and web appliances could have on reducing infrastructure requirements thereby making computer technology available to a greater number of educational institutions worldwide.

Total Cost of Ownership

“Beliefs about total cost of ownership are, like religious convictions, intensely held and widely diverse” [Gibson, 20]. Kirwin defines TCO as, “...a holistic view of cost related to information technology acquisition and usage at an enterprise level” [qtd. in Gibson, 20]. Quantifying IT costs and benefits is very difficult if not impossible. Some costs are obvious such as the initial price of hardware and software. However, Gartner Group Inc., [cited in Gibson, 1997] has long contended that other costs such as upgrading, training, maintenance, and technical support are many times the PC’s initial purchase price. It is estimated that TCO for a PC on a local area network costs somewhere between US\$9,000 and US\$12,000 per user per year [4]. Information technology should be seen as cost effective; however, if technology is taken down the wrong path, it could prove to be very costly. TCO is a legitimate concern that must be constantly evaluated. Schools should be looking to web-based applications as a means of reducing IT costs.

Outsourcing with ASPs

One of the biggest IT costs for schools is buying prepackaged applications for in-house use; however; this may become a thing of the past. As schools struggle to find new ways to collect, analyze, and share information and reduce IT costs, one revolutionary approach is to use what is known as an application service provider (ASP). The ASP market represents a fundamental paradigm shift from the traditional ownership of software licensing and services to outsourcing. An ASP is an independent, third party provider of software-based services, which are deployed to customers across a wide area network [1].

ASPs can prove to be cost effective because the school needs no in-house application servers or database servers to support the applications. Rather, ASPs provide services to implement, host, and maintain application software and IT services in a hosted environment. Web browsers provide a standard way to interact with an ASP system and neither the Internet nor browsers add much cost to the outsourcing equation. Other not so obvious IT costs include maintenance and support. ASPs have the potential to simplify these issues according to advocates of the approach. Boyd [cited in Bushweller, 2000] contends that regularly updating information requires information technology expertise that schools don’t have. According to Boyd, this is especially the case in small to medium-sized districts that can’t afford to hire teams of information technology specialist. ASPs can relieve customers’ installation and system-support hassles and give customers browser-based web access. McKie [9] contends that outsourcing with an ASP is certain to be part of the future of every organization in the Internet age.

Virtual Communication

“The most important information we have to communicate to parents is about their own children” [Reid, A24]. While research shows that student learning is maximized through parental involvement [20], keeping parents informed takes valuable time and resources. In an effort to address this problem, many U.S. State legislatures are mandating that schools embrace the power of technology to bridge the communication gap. For example, under Utah’s 1999 Digital State law, schools must make “reasonable progress” toward making student information available via the Internet by July 1, 2002 [19].

The real value of the Internet is not in its ability to reduce costs or infrastructure requirements but in its ability to make the data available to the appropriate parties at the most opportune time. The information must be easily accessible to authorized users, and with the help of web-based services, school administrators and teachers have the ability to make pertinent school information readily available to governing bodies, parents, and students. As access to the Internet becomes more

universal, parents can assess their children's current progress on their own web devices. For example, one of the most fundamental types of school-to-home communication is the report card. Producing a report card in the traditional manner can be very disruptive to the instructional process. However, if schools were to apply the concept of "anywhere, anytime" reporting to the grade report system, parents and students could produce a progress report on demand without intruding on the learning process.

More and more software programs are utilizing the Internet as a communication tool. For example, Excelsior Software and National Computer Systems Inc., both promote using the web as a tool for connecting school and home. However, many schools are prohibited from using many of the products on the market due to the costs involved. FreefromIT.com, an ASP, provides a solution that any district can afford. They have developed a "free" web-based classroom management system (<http://www.classroll.com>). The company is unique in that it can offer its product at no cost to schools because it generates revenue by advertising banners on its website. Because the programs and the student data are stored and hosted by Classroll.com for free, the only thing that is needed to access the product is a web browser. Most experts think it's not a question of whether schools will be communicating with parents via the Internet, but where and when. Companies such as these will play a crucial role in helping schools move to the new era of "anywhere, anytime" computing.

Data Security

On May 3, 1999, a devastating tornado ripped through Oklahoma killing people, destroying businesses and schools, and literally wiped towns off the map. While most school see the necessity of securing computer equipment against such disasters, they fail to protect their most valuable asset; information. Computers cost money and therefore should be considered a valuable asset. However, when districts take a moment to consider why they are so willing to invest large amounts of money on computer equipment—to store, access, and transmit information—the value of that information becomes more obvious. In the education community, information about students, staff, and other resources is far more valuable than the most costly equipment. There are countless examples of how data can be destroyed; theft, vandalism, and hacking, just to name a few. Sharing data via computers and networks has proven time and time again to be a cost-effective way of getting things done; however, inappropriate access using this type of technology has emerged as one of today's highest-profile data security issues [18].

The safeguard to the destruction of data is to keep a copy of the data in a different location, known in the technological world as "off-site" back-ups. Technology makes it affordable and relatively simple; however, far too many of those responsible for the off-site back-up fail to see its significance. It would only take one catastrophe like the example given above to realize the significance of an off-site back-up. Safeguarding data from inappropriate access requires constant monitoring and a tremendous amount of technological expertise. The idea of outsourcing with an ASP rather than having the data stored on an in-house system is a security concern for many schools. However, Stacy Boyd, president and CEO of Project ACHIEVE, a San Francisco based ASP and former middle school principal, [cited in Bushweller, 2000] contends that information is no less secure at an ASP site that it is in-house. Outsourcing with an ASP is one way of ensuring that your data is secure. After all, safeguarding is their business, educating is ours.

Connectivity

Access to computers and the Internet and the ability to effectively use this technology are becoming increasingly important for full participation in a global society. The Internet has made great strides in eliminating the issue of distance and geography. As of March 1999, it was estimated there were

more than 200 countries connected to the web [7]. The art of estimating how many individuals are online, throughout the world, is an inexact one at best; however, it is estimated that 304.33 million people were online as of March 2000 [11]. The following table shows the estimated global distribution by region.

Table 1		
Estimated Number of People On-Line		
Region	Number (millions)	Percentage
Total "On-Line" World	304.33	
Africa	2.58	0.85%
Asia/Pacific	68.9	22.64%
Europe	83.35	27.39%
Middle East	1.9	0.62%
Canada & USA	136.86	44.97%
South America	10.74	3.53%
Source: NUA Internet Surveys http://www.nua.ie/surveys/how_many_online/index.html		

It is estimated that sixty-six percent of U.S. households will be online by 2003 and seventeen percent of Western European consumers are expected to be online by the end of 2002 [13]. While this may sound impressive, it must be put in perspective. We share the same world and we share the same challenges. While the web is reaching an increasing number of people worldwide, we remain a "disconnected" world.

In the new information age, the majority of the people in the world do not have access to the most basic telecommunications infrastructures and its benefits. There are approximately six billion people in the world spread out over a billion households. Fewer than two percent of the world's population have access to the Internet [14]. More than half of those households do not have a telephone, much less electricity to plug in a computer [3]. For example, sixty-five percent of schools in Mexico do not have telephone access [8]. Where there is limited access to telecommunications, access to education is likewise limited. Unless the infrastructure is in place, those in most need of an education will continue to be at a disadvantage. While wireless technology is in its infancy, it and the ASP model may very well be the solution in ensuring that there is equal access to technology in schools around the world.

Currently, the PC is the primary tool with which to access the information Internet; however, that doesn't mean is the best way [21]. An alternative to standard landlines, wireless technology is becoming the communication method of choice for developing and industrialized countries around the world [16]. Wireless web devices such as the advanced cellular telephones with Internet browser capabilities is one such alternative to standard landlines. Qualcomm Inc, the developer of CDMA digital wireless technology, has developed a wireless local loop phone targeted toward countries with developing communication requirements that are currently without telephone service [6]. Using this type of wireless technology, telephone infrastructure can be implemented more quickly and at a lower cost than traditional landline service. Hosted applications provided by an ASP promise not only to reduce costs but because they can be located anywhere in the world, they can also reduce some of the local infrastructure requirements. Wireless technology, ASPs in a hosted environment, and web devices can be the solution in bridging the gap between the "haves" and "have-nots". Vocational Educators are often viewed as the leaders in technology. The

Webvolution is an opportunity for us to take the lead in discovering how we can use this technology to enhance the educational process.

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