“e-Learning will be the next big killer application on the Internet –
it’s so big, it’s going to make e-mail look like a rounding error.”

--John Chambers, CEO, Cisco Systems

As technology and the Internet specifically have radically changed many industries (retail, financial services, media) many are looking to education as the next industry that will be changed. The education industry is second in size only to the healthcare industry in America. Not surprisingly hundreds of companies and entrepreneurs are searching for the technology and applications that will allow them to tap into this huge market. The cost savings of successfully utilizing e-learning are enormous. In the corporate training market, it has been estimated that 50-70% of the costs of a training program consist of such non value-added services as travel, lodging and food. With e-learning these costs go away. However, it is not clear that the education and training industry is prepared to radically change the way teaching and learning are accomplished overnight.

E-learning has been coined the new buzzword covering practically anything that combines education with technology. Much like the term e-commerce, e-learning has multiple definitions. For purposes of this paper, I will use the term e-learning to refer to content delivered via electronic media for the purpose of education or training. These media include the Internet, intranets, interactive TV, satellite broadcasting, and CD-ROM. Subsets of e-learning include online learning, which is learning via the Internet or an intranet, and computer-based learning. While much of the early adoption of e-learning has been by corporations, most, if not all of the
benefits and drivers of e-learning can be applied to both the K-12 and postsecondary education
systems. However, it is clear that corporations are the early adopters of this technology. This is
not surprising given both the comparative level of technology infrastructure and decision making
speed of a private corporation versus a public education system.

To describe the e-learning industry it is useful to divide it into three segments: Content,
Services, and Technology. Content companies create and publish original education content.
Service providers offer education related services including professional services. Technology
players develop the underlying technology and systems to enable the delivery of content.
Increasingly, companies are recognizing they need expertise in all three segments to compete
effectively. As a result, companies are entering into strategic partnerships or acquisitions in an
effort to be a “one-stop shop” e-learning provider. (See Appendix 1 for overview of industry
players.) This paper will review the trends that are driving the rush to e-learning, provide a
broad overview on the e-learning landscape today and provide an in-depth review of the
technology segment specifically focused on the technologies used as well as the creation of
business models around these technologies.

TRENDS IN EDUCATION INDUSTRY
Several factors are contributing to continued growth in the education and training industry.
These include the rise of the knowledge-based economy, an increasing recognition of training as
a competitive edge and recruitment and retention tool, and finally the change in mindset of
corporate managers to training.
Rise of the Knowledge Based Economy – As the US economy increasingly moves from a service-based economy to a knowledge-based economy the importance of training and education is magnified. The U.S. Labor Department estimates that 85% of the nation’s jobs will require education or training beyond the high school level in the year 2000. This compares to 65% in 1990, and only 40% in 1950. Not only do corporations require workers with a higher level of skills, but these companies are forced to spend increasing amounts to keep these workers up to speed on the latest technology and business trends.

Training as a Competitive Edge – Increasingly executives are realizing that in this age of ubiquitous information business strategies and tactics are quickly copied by competitors. However, it is clear that the ability of a corporation’s employees to learn more quickly than others is a sustainable competitive advantage. Recognizing this, companies view the cost of training and continuing education as a strategic investment rather than simply an operating expense.

Training as a Recruitment Tool – With unemployment at record lows, it is increasingly difficult to entice new employees. Just as companies have recognized the increasing importance of skills in this economy, employees also have recognized this fact. The result is that employees are more interested than ever in the quantity and quality of training they will receive. Along with recruitment, companies are also using training and continuing education as a tool to retain their best employees.

TRENDS DRIVING E-LEARNING

At the same time that training and education is viewed with increasing importance, strong trends are driving resources towards e-learning. These include the pervasiveness of technology, the high costs for corporate training, globalization, and the increasing need to develop training programs very quickly.

Rise of the Information Age – Without the incredible rise and adoption of new technologies e-learning would be nothing more than a novelty. Most importantly the increasing adoption of the Internet in all aspects of life is enabling the growth of the e-learning business. An increasing number of K-12 classrooms are being wired for Internet access. Technology is enabling content providers to develop interactive learning environments. The arrival of high-speed broadband access will only serve to increase the richness of the learning experience.

High Cost of Corporate Training – A large part of corporate training budgets consist of items that do not add to the education process. These include travel costs and time, lodging and food. With e-learning these costs are eliminated. A recent Forrester Research survey of corporate training managers listed “Cost Savings” as the number one benefit of online training. The same report states that IBM saved more than $80 million in travel and housing expense in 1999 by deploying online training.²

Globalization – E-learning is able to bring the benefits of globalization without the high costs of rolling out training programs on a global basis. With e-learning, the reach of a training or

education program is multiplied. Training can reach a greater number of people at times convenient for them, in whatever language they prefer.

**Reduced Development Cycle** – The increasing focus on corporate training and education has led to a call for more relevant material. As a result, corporations are increasingly demanding customized training programs that fit their strategic initiatives. This just-in-time training development is possible using technology. Providers increasingly are building learning modules that can be re-used and quickly customized at the request of their customers.

**CURRENT LANDSCAPE OF E-LEARNING**

**Market Size**

One of the primary reasons behind the rush to provide e-learning technology and services is the fact that education in the United States is a huge market. The education and training market was estimated at $772 billion in 2000. This sector of the economy is second only to healthcare in terms of dollars spent annually. Education and training consists of five segments: corporate training, post-secondary education, childcare, K-12 education, and continuing education. (See Appendix 2 for breakdown of market segments). By all accounts, the market for e-learning is still in its infancy. However, it is still estimated to be an approximately $11.5 billion market by 2003.

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4 International Data Corporation.
Content

Content providers create original educational material that can be distributed in multiple ways. Content providers include basic off-the-shelf software as well as customized training programs and curricula. There are various content delivery mechanisms including synchronous and asynchronous delivery. Asynchronous delivery is content that is “one-way” in nature. A student would view the content but would be unable to ask questions or interact with other students in a real-time fashion (See Technology section for more detail). In addition to creating content, certain content providers license content from universities and other academic institutions. They then repackage this content based on the needs of their customer. Content providers vary in their target audience. Providers focus on the B2B market (corporate training), B2C market (continuing education), postsecondary market (colleges and universities) and K-12 market.

Services

Service providers offer learning-related services to each of the above market segments. There are generally three types of service providers in the e-learning space: portals, learning service providers, and professional services. Portals are very similar to general Internet portals such as Yahoo! or Excite. They attempt to provide a complete e-learning solution in one place. To do this, they will aggregate content from a number of content providers, and then both host and distribute this content via their portal. Similar to other portals a key determining success factor is the ability to generate sufficient levels of traffic to justify charging others for being a part of the portal. Rather than go after a broad consumer base using advertising, the e-learning portals have focused on entering into distribution deals with partners that could drive traffic (i.e. Fortune 500 companies or universities).
Learning service providers are a form of application service provider (ASP) that offer a variety of services on a hosted basis. Services include assessment and testing services, granting of degrees, and online tutoring and mentoring. Similar to an ASP, they offer the benefit of a pay as you go system. Additionally, their customers eliminate the risk of purchasing obsolete technology. Since the technology is hosted, the LSP bears the cost of upgrading to the latest and greatest technology (or risk their customers going elsewhere).

Professional service providers have naturally sprung up to support this nascent industry. Offering everything from web design to the creation of specialized content, service firms are trying to fill in the gaps as companies begin to experiment with e-learning.

TECHNOLOGY

Much of the technology enabling e-learning is the same technology that is fueling the rest of the Information economy. Many of the key order winning criteria that exist in the broader technology markets apply here as well. The technologies that are scalable, flexible, and easily integrate with other company’s (i.e. their customers) systems are the ones that will likely win. However, there are certain specific technologies that allow e-learning to be that much more powerful of a tool. In addition, there are various standards and levels that describe the method of e-learning. These are self-paced e-learning, asynchronous collaborative e-learning, and synchronous collaborative e-learning.
Self-paced e-learning (SPEL) is what most users would simply consider the basics of the World Wide Web. Examples of SPEL on the web include self-help guides, resources or other reference materials such as maps or encyclopedias. Many people view SPEL as an e-library and many of the companies that are in this space act as reference materials for one or many subjects. Many sites have aggregated content (similar to the portals discussed above) and adopted either an advertising-based or subscription model revenue model. There are literally hundreds of companies in this space. The challenge for each of them is to build awareness and credibility among potential students. Many analysts believe that brand will be a key differentiator among these companies. As a result, many have sought to partner with universities. For instance, UCLA has partnered with a company called OnlineLearning.net, which has the right to distribute UCLA courses online. Other companies in this space include Unext, Pensare, and CBT Group.

Asynchronous collaborative e-learning (ACEL) is the next level of interactivity from SCEL. In an asynchronous learning environment the participants cannot communicate without a time delay. Users can communicate via threaded text-based discussions, but not in a real-time manner. Examples include self-paced courses taken via the Internet, CD-ROM, videotaped classes, streamed audio/video Web presentations, online chats and discussion groups and e-mail. Students that would be best served in an asynchronous learning environment include those who have to learn at odd or varied hours and who are self-directed learners that have the initiative to complete a course on their own.

Synchronous collaborative e-learning (SCEL) is a real-time, instructor-led online learning event, in which all participants are connected and communicate with each other in a real-time manner.
SCEL is designed to simulate the classroom. It allows students and teachers to collaborate in real-time over the Web. Some of the features of this type of e-learning environment include:

- Streaming audio and video – enables use of audio and video clips to enhance the learning and allows students and professors to talk to each other.
- Application sharing – allows the class to view the same document as one student or the teacher makes changes allowing those in the class to follow along using their own computer.
- White boards – functions similar to a chalkboard, allowing professors to take notes on a board visible to the students.
- Message boards – places where students can post questions and answers to various topics.
- Hand Raising – feature that alerts the professor that a student has a question or comment.
- Floor Control – allows the professor to determine who is “in” the virtual classroom and to get feedback on the pace of the discussion.
- Breakout Groups – allows smaller groups of individuals to meet outside the classroom for collaboration.

Companies that provide the technology for such a virtual classroom include LearnLinc, LearningSpace, Data Beam, Centra Softare, and BrightLight. Similar to traditional software companies, the revenue model is a license fee plus additional charges for additional users of the software. A synchronous learning environment is best suited for a student that can commit to a fixed schedule of class time and who prefers to have some guidance to their learning experience.
Importance of Standards

As companies rush to develop the underlying technology platforms to enable e-learning, the issues of standards becomes increasingly important. Most observers believe that much like other technologies (i.e. Java, Linux) the technologies that are open source and easily compatible with various systems are the ones that will prove the most successful. With the importance of developing training programs at a quicker pace, the ability to use and reuse content developed by others will be crucial. Only with a clear set of standards and open systems can the full benefits of this technology be realized.

CONCLUSION

It is fairly simple to imagine that the company that can best simulate a real classroom will have a huge potential in the e-learning space. However, it is still uncertain whether simply replicating the features of a classroom (chalkboards, hand raising, etc.) truly adds to the learning experience. Many people building the technology do not have a background in education or an understanding of the way people learn. These technologists will be able to replicate the offline world online. This alone is a huge advance and one that will result in a broader reach of education at a lower cost. However, when technologists begin to work with those doing research into how we learn we will see some truly transforming technology. E-learning is just getting started and we will see many iterations of such technology before we greatly improve the way in which people learn.