

POWERING THE LEAP TO MATURITY



October 2001

“Moving from the one-room schoolhouse to the-one world schoolhouse is now a reality.”

Cisco Systems

By

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E-Learning at a Crossroads

After years of a prolonged, slowly evolving form of adolescence, the conditions are now ripe for e-learning to become a powerful force. The supporting technology has made significant advancements over the past few years and companies now are thinking more broadly on how they can take advantage of these applications. The e-learning industry is at long last poised to cross the evolutionary threshold to maturity.

However, significant barriers still exist within the e-learning market that could impair the growth of this application domain and, consequently, hinder the benefits for corporations. These obstacles live not only in the disjointed supply side of the market, but also in the corporations that have increased their demand for these new technologies. The eLearning Ecosystem is designed to address the barriers on both sides and to help companies realize the full potential of e-learning.

If you define "maturity" for e-learning in the same general terms used for the IT industry, then e-learning needs to become an enterprise-level application that exploits the capabilities of network computing and system integration to enable value-generating efficiencies and innovations across large and complex organizations. Through a recent series of developments, the infrastructure needed to enable e-learning to become an enterprise-level application has taken shape and for many market leaders, e-learning has finally graduated from its long stasis in adolescence.

Numerous firms have already become early adopters of enterprise-wide e-learning. Companies such as EMC, Dell, Sun, IBM, and Cisco are today deploying the technologies of e-learning on a broad scale. Each reports substantial benefits both in quantitative terms from cost savings and in qualitative terms from enhanced knowledge flows and deeper professional communities. But each of these firms has also experienced the challenges of early adoption, particularly in the area of systems integration where the lack of standards and existing interapplication integrations have resulted in demanding implementations.

The eLearning Ecosystem is symbolic of this graduation process and serves as a catalyst for helping it bridge to a more mature state that is unhampered by the typical challenges of early adoption. Appropriately, the ecosystem is driven by an integration-centric vision. It seeks to knit together the complementary products and services of a set of learning technology companies to create a comprehensive scope of e-learning functionality that can be quickly deployed. More specifically, the products and services of the ecosystem members:

- Are integrated across a key set of technical and operational touch points
- Maintain those integrations, even as each of the ecosystem software products undergoes its own separate release plans
- Are complementary and seek to cover the entire range of e-learning functions that have already demonstrated the ability to add significant value in the training and knowledge management markets

- Are standards-based (many are even significant influencers of key e-learning standards)
- Are best-of-breed, as determined by Cisco and the member companies of the ecosystem.

The Barriers to Maturity

From an IT perspective, "maturity" is defined by an ability to effect dramatic and positive change quickly. To achieve this impact, an organization must operate against a robust infrastructure and must be held together by widely accepted technical standards backed by governance mechanisms that can rapidly drive change across a large audience, typically defined in terms of an enterprise or a marketplace.

Using this characterization as a benchmark, e learning and its various historical forbears have been anything but mature. For example, e learning has been plagued by a high degree of fragmentation on the supply and demand sides of the equation.

On the Demand Side

This fragmentation is very evident in most large organizations where typically several independent training departments are scattered across multiple operating units in a very decentralized pattern. To date, this fragmented pattern of small departmental training units has not been counterbalanced by any substantive centralizing forces. In the absence of any centralized authority for administering educational services, the pattern of buyers is, itself, fragmented.

Though there are many reasons for this overly decentralized pattern, two stand out as most important and both represent significant barriers to the adoption of enterprise-level e-learning:

- *Continued reliance on instructor-led training (ILT)* – According to the 2001 American Society of Training and Development (ASTD) State of the Industry Report, 80 percent of corporate training still takes place in the classroom. Although instructor-led training events require significant preparatory efforts, they do not require the kind of scarce and specialized skills or the highly collaborative work products that typify IT deliverables. Thus, there has never been a compelling need to create a centralized
- *Wide dispersal of expertise* – In an era increasingly dominated by knowledge workers (that is, workers who perform no repetitive work), the expertise of the organization is widely dispersed across the various business units. For aspects of the corporate curriculum that are based on expertise unique to the firm, the most logical location to capture that knowledge is also widely scattered

In most corporate settings no major centralizing forces have been capable of opposing these powerful factors of decentralization. Training is based on expertise that is spread across the organization. Because the production of training deliverables for the classroom

does not require specialized or highly elaborate development processes, the result is a decentralized and fragmented pattern.

On the Supply Side

Fragmentation has ruled in this area as well. Even though the corporate training market has always been measured in the billions of dollars, the granular structure of the demand side has never enabled any strong market leaders to gain traction. But why?

The predominant influence over the structure of the training market is our continued evolution as a knowledge economy. That structure, in turn, is a direct reflection of the myriad occupational groups and corporate functions that characterize a modern workplace that is increasingly governed by knowledge workers.

Even in the most traditional, industrial-style companies, a mosaic of professional specialties must be employed to remain competitive. These specialties include accountants, legal advisors, IT professionals, and HR specialists, as well as the scientific disciplines that underlie most industrial product families. For those who would supply learning content in any format, the opportunities for creating broadly transferable products are limited. Like all forms of publishing, the supply side for e-learning content must respond to a thousand specialized niches within the organization.

For the suppliers of e-learning content creation and administrative applications, the environment is far different. Fundamentally, the basic content, process, and repository management requirements of e-learning are no different than they are for other corporate user constituencies.

Market Structure

However, although producers of authoring and training administration tools have been able to survive over the years and have even found pockets of prosperity, they have been unable to scale to the large size and functional sophistication that typifies the evolution of most software tool sectors. As anyone who has shopped for authoring or administrative tools can attest, hundreds of small players are still in the market.

To understand why these inherently scalable segments of the e-learning market have never scaled, one must go back to the demand side. There is a general lack of buy-side sophistication caused by the internal fragmentation of the corporate training function. This condition has blocked the formation of the kinds of governance that have typified other major corporate application domains, such as those that have emerged to support customer relationship management (CRM) and enterprise resource planning (ERP) deployments. Put simply, e-learning suffers from a lack of e-governance.

Does this challenging market structure doom e-learning to eternal adolescence? Hardly. Indeed, there have been numerous tipping points in the history of learning technology where it appeared that the leap to maturity was imminent. During the mainframe era, there was a small, but substantial success story to be told about learning management.

However the text-only nature of dumb terminals made it very difficult to provide inspiring content.

With the advent of the PC, quickly followed by the incorporation of CD-ROM, it appeared that a golden era for computer-based training was upon us. But once again the awkward nature of CD distribution imposed yet another critical barrier. At both these points in the history of learning technology, the appetite and business need for what is now e-learning were clearly present in the marketplace.

Build It and They Don't Necessarily Come

Developing an e-learning offering does not automatically ensure success. We have seen four key reasons why e-learning initiatives fail. It is no coincidence that these four elements fall within Cisco's four Pillars of *Net Ready* – Leadership, Governance, Organizational Competencies, and Technology.

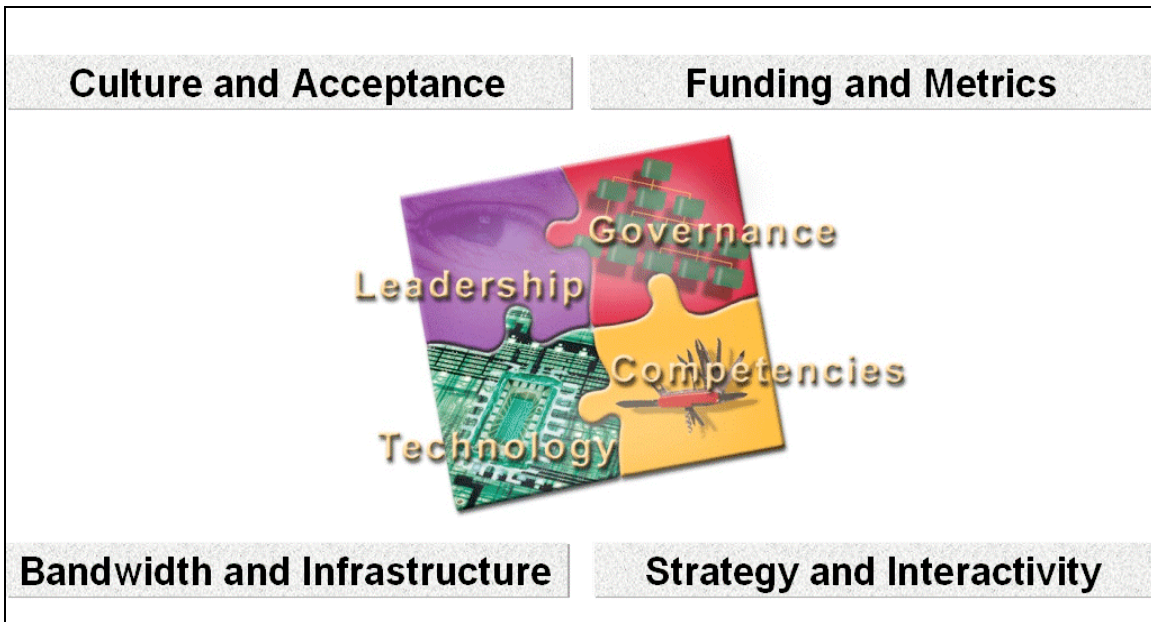
In their book, *Net Ready*, Hartman and Sifonis identify a concept that, when embraced, greatly increases the probability of successfully converting a traditional business process to a Web-based process. This is particularly important considering the state of corporate learning today.

- **Leadership – *Corporate culture and acceptance*** - Leadership is arguably the most critical of the four pillars. Without it senior managers will not be held accountable for the culture shift required for e-learning. This will cause even the most robust and most compelling applications to fail because without executive leadership support, evangelism, guidance, and accountability, the corporation's culture as evidenced by employee behavior will become a barrier to adoption.
- **Governance – *Lack of funding and metrics*** - Measuring your success and identifying the funding model is critical to the success of e-learning. A governance model is necessary to bring all business units together with a vested interest in building competencies and skills. Corporations need to take advantage of metrics and best practices in order to take full advantage of what e-learning has to offer. Solidifying a corporate e-learning architecture and spreading the ownership throughout the enterprise will establish synergies that are essential for success.
- **Organizational Competencies – *Lack of strategy and interactivity*** - Understanding the organizational competencies that are needed to create Web-based instruction that is compelling and sound requires different skills than those required for classroom instruction. It is essential to analyze your internal competencies and decide where to complement your organization with external resources for developing strategies, project plans, and content. This will help establish the required quality and interactivity standards needed to ensure full adoption of your Web-based curriculum.
- **Technology – *Lack of infrastructure and bandwidth*** - As with any transformational effort to Web-enable a traditional business process, it is critical to view technology and infrastructure as an enabler to achieving business objectives. Any other strategy

positions technology as a barrier, inevitably increasing your chances for failure or low adoption.

Today’s corporate education has not evolved as far from the one-room schoolhouse as other business processes have from their early methodologies, such as CRM or supplier management (SCM). By driving for excellence in the four Pillars of *Net Ready*, Leadership, Governance, Organizational Competencies and Technology, a company will accelerate the successful adoption of e-learning across the enterprise.

Figure 1: Four Barriers to Success



Market Structure Preconditions for a Leap to Maturity

So why is our current era providing a ladder to maturity while both of the predecessor eras showed significant promise, only to fail? Why are we now prepared to assert that all of the rungs to that ladder are finally in place? Three major events have occurred in the past few years that have laid the foundation for e-learning to make its leap to maturity to an enterprise-level application domain.

The Web – The advent of the Web has had an even stronger proportional effect on e-learning than it has on other IT sectors. While other key application domains were already achieving enterprise status through client/server implementations, the Web has provided instructional technology with a centralized set of services that can be offered across departmental and organizational boundaries.

Prior to the Web, the only way to deliver media-enriched content to the desktop was via CD-ROM, or its even more unwieldy predecessor, the video laserdisc. The media-

handling and administrative control problems associated with CD-ROM made this form of delivery highly problematic. The geographic and functional complexity of the global corporation makes physical distribution systems very difficult to manage.

The distribution capabilities of the Web, particularly those of its latest broadband technologies, provide a powerful alternative to the fragmentation storyline of corporate training. Although bandwidth issues associated with electronic training delivery still linger, the ability to produce, acquire, manage, and distribute corporate curricula from a centralized source is a powerful new force. For the first time, media-rich content can be published to, cataloged, accessed, and distributed from a single control point. The network capability of the Web overthrows CD-ROM and its many handling and version control problems.

The Web provides a new center of gravity for the entire IT community, creating the strongest foundation for standards-driven development in the history of software engineering. This foundation enables a much richer environment in which to develop new applications. Learning technology has a far richer set of resources to which it can link and from which it can draw. Collaboration, federated databases, online marketplaces, and broadband networks are just some of the advanced technologies that are newly available to the learning community for this attempt at maturity.

The learning management system – The ease of delivery offered by the Web is further amplified by the advent of the learning management system (LMS). The LMS has been called the enterprise resource planning (ERP) of business to employee. Although it has not reached anywhere close to the breadth of the ERP, learning management clearly has the key attributes required to ultimately achieve the same level of size and functional sophistication. The corporate learning management system provides:

- The data structures needed to manage learning resources in the context of the geographic and functional complexity of the global corporation
- The application framework needed to enable and justify the reengineering of corporate training and knowledge management processes
- The application framework needed to support personalization of workforce learning, which for the knowledge worker will likely become a decisive source of competitive advantage
- The application framework to manage skills, competencies, and performance management, tying it all together with integration to the corporate HR systems

The blended solution – Over the past two decades, literally dozens of studies have been conducted on the efficacy of interactive learning content. These studies reveal that, when compared with classroom-based delivery, people learn more, in less time, and with longer periods of retention when they are presented content via interactive multimedia. Although these findings might suggest a wholesale conversion to asynchronous forms of training delivery, recent experience has revealed that this delivery model, when used to the exclusion of other training and other performance support techniques, possesses its own set of unique challenges.

When interactive training is offered in an unmonitored environment, that is, an environment where no instructor or other authority is present, usage rates often fall short of what sponsors expect. Thus, without some form of authority to set goals, monitor, and otherwise motivate learners, simply building and posting the content will not ensure its usage.

This issue goes deeper still. Asynchronous, multimedia courseware offers the benefits of anytime, anywhere learning, provided the student has access to a PC-like device. However, regardless of how well designed the content may be, interactive multimedia will address only a single “style” of learning. There is mounting evidence that this “one-size-fits-all” approach is wrong. A broad diversity of learning styles is present in the workforce population, and the most effective approaches will accommodate as wide a range of those styles as is economically and technically feasible.

Thankfully, the e-learning market has responded to these challenges in several ways that take advantage of Web connectivity. First, as we have already seen, LMS’s offer functionality that provides the kinds of goal setting and performance tracking that characterizes the role of the teacher/mentor or manager. Along these lines, the mature LMS features such capabilities as curriculum maps aligned with competencies and career paths; progress reports that can be made visible to one or more levels of management; and assessment instruments that measure readiness for professional certifications. These functions enable the LMS to “know” the sorts of things about learners that one would expect of a teacher or an educational institution and inject the once-missing element of accountability into the e-learning equation.

The progress with learner accountability has been matched by the rate of innovation in the e-learning sector devoted to instructional delivery options. This rapidly evolving sector has introduced numerous technologies that address a very wide range of learning styles. These learning technologies include collaboration, simulation, discussion forums, technology-based lecture, video story telling, and real-time performance support. This sector has also witnessed the sudden maturation of the virtual classroom, also known as synchronous learning or “live” e-learning, which is a technology that places the instructor back at the heart of the group learning experience.

In short, there is now a much greater range of ways in which learning technology can be matched against the endless variety of learner needs and styles.

As the industry has evolved through several rounds of trial and error with respect to the various learning technologies, a new conventional wisdom has formed. Under this thought process, the best approach is one that mixes and matches the available technologies to meet the specific training needs of both the sponsoring organization and the individual learner. This “blended” approach is typically applied across a range of subjects. But even within a given subject, a variety of technologies may be used.

For example, a virtual classroom model may be used to bring a group of learners together on a periodic basis to promote a sense of community and to provide for the presentation

of course policies and expectations. That same course might also rely heavily on Web-based training (WBT) content to accomplish many objectives:

- Convey the bulk of the conceptual material
- Test creativity on simulation applications and provide a “hands on” experience
- Enable students to carry out work assignments through collaboration and expert authoring tools

Further, if certification were associated with this prospective corporate learning scenario, the experience could be culminated in some type of “live” environment to accommodate the proctoring requirement.

Even for the once-isolated technology of interactive multimedia, this wave of Web-enabled innovations is having a beneficial effect. Course content can be constructed using a “learning-object” design model in which individual modules are highly granular and capable of being sequenced in any order and in which the various content elements are indexed and managed separately. This scenario enables courseware developers to blend this delivery option with any number of other e-learning technologies. Under the blended approach model, content captured into a learning object format can be used in a wide variety of ways to either lead or support the learning process.

This approach allows a student to either watch a video lecture, download the audio (MP3) version, simply print the text/graphic version of the same content, or take the entire multimedia learning object via the browser. Under this new design model, all these delivery options may be employed to address the same basic competency development for the learner.

The blended approach has rapidly gained credibility and popularity in the corporate training market because it defuses the political issues that swirl every time one delivery method is presented as a complete substitute for another. It also enables training sponsors and professionals to allocate learning resources in a dynamic and flexible way.

Taken together, Web connectivity, learning management, and the blended solution have laid the foundation for a leap to maturity. Although the face-to-face, group learning event will always be a part of the corporate training mix, the frictions of fragmentation that have long supported its dominance are at long last about to be overcome.

The Ecosystem Springboard

The e-learning industry is poised for its leap to maturity. With a coming of age, the industry will be capable of offering large organizations a set of sophisticated options for improving performance and deepening customer and employee satisfaction while reducing the time necessary to absorb change and innovate new directions. Top management will now have the tools they need to make the development of human capital a visible and measurable process.

The eLearning Ecosystem is designed to provide all the key enablers needed to ensure a successful leap to maturation, including:

- A standards-based networking infrastructure, capable of delivering media-rich training content to the desktop
- A robust application framework, capable of managing the organizational and learning-resource complexities of a global corporation
- A comprehensive, integrated set of e-learning applications, capable of providing the diverse, but complementary technologies needed to dynamically construct blended learning solutions that map to the modalities of learning
- An ongoing commitment to standards-based integration, ensuring that e-learning constituencies are able to experience cumulative benefits from their investments
- An implementation methodology that ensures clearly defined processes for governance, leadership, and accelerated deployment of e-learning solutions

The Ecosystem Membership

Recognizing the need for an integrated set of e-learning applications to match the marketplace demand for a blended solution, Cisco's Internet Business Solution Group (IBSG) identified six best-of-breed vendors in 2000. A matrix of partnerships was established between these vendors, and it became the eLearning Ecosystem.

As a first step, an architectural workgroup (AWG) was formed, with membership from each of the six vendors. The purpose of this group was to design and then implement integrations along many of the key complementary touch-points between the member products.

These integrations were driven by two objectives: 1) the desire to feature the complementary functions of each of the six products; and 2) conformity to industry standards, most notably the SCORM (Sharable Courseware Object Reference Model) standard. In November 2000, at the Orlando Plugfest, the ecosystem demonstrated the cross-integration of these six products, highlighting the complementary functions of each and conforming to the Advanced Distance Learning (ADL) Lab's SCORM standard.

The member companies and the associated contributions and product functionalities that make up the ecosystem offering are as follows:

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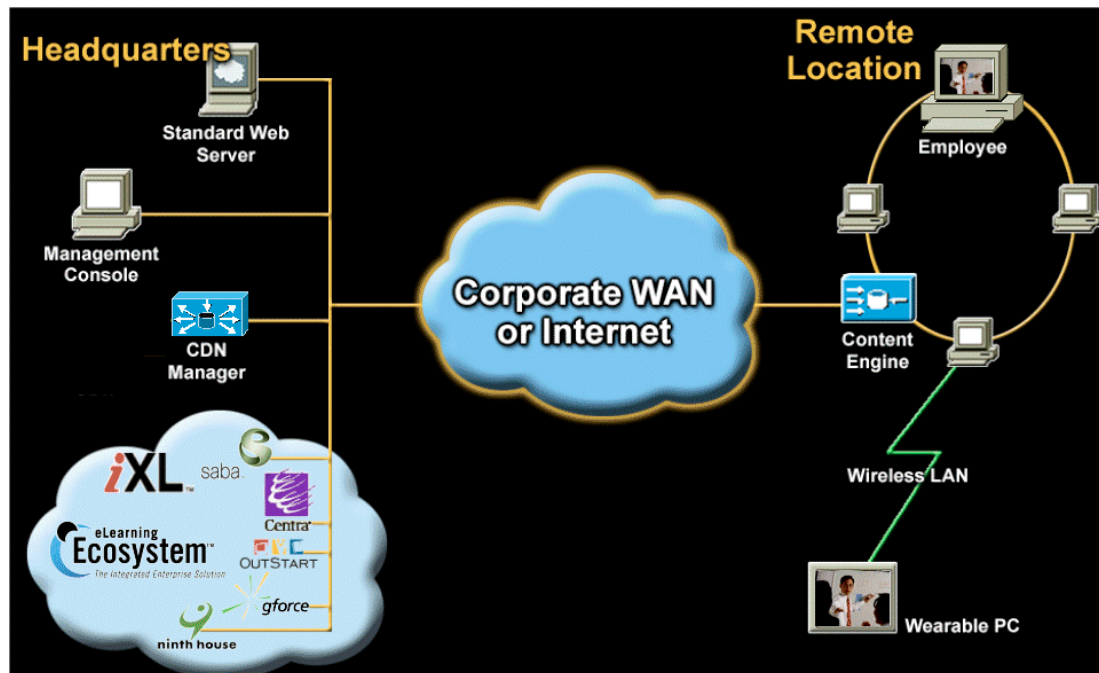
To help overcome the many bandwidth constraint problems that have plagued e-learning, Cisco has developed an offering known as CDN, the Content Delivery Network. This networking infrastructure solution works through the fundamental principle that rich media content should be pushed to the edges of the network where it will be closer to the user base and where its need to traverse WAN links can be minimized.

This store-and-forward architecture has two primary hardware features:

- Cisco Content Distribution Manager (CDM), which operates from a central site and provides replication services to remote sites across low-bandwidth WAN linkages

- Cisco content engines (CEs), which are low-cost devices located at remote sites to store and route rich media, e-learning content to LAN-attached client devices. The Figure 2 represents a simplified visual model of the Cisco CDN architecture

Figure 2: Cisco CDN Network with eLearning Ecosystem



The net effect of a CDN implementation is more efficient use of bandwidth, faster delivery of rich media content, and an e-learning-enabled network infrastructure that does not require any new or specialized software additions, because familiar browsers and media players can remain in use.

Another Cisco IP/TV solution, which is based on network-efficient multicast technology, makes it possible for Human Resources, Corporate Communications, Sales & Marketing and other business units to deliver live TV-quality video events such as training and executive communications to desktop PCs and meeting rooms. Subject matter experts (SMEs) can present from any location equipped with a Broadcast Server and a camera, allowing them to reach far more learners-at a fraction of the cost of traditional classroom training. Employees access live sessions through a simple media player, and can easily tune into scheduled events through an intuitive online "TV guide". The IP/TV solution is a turnkey system that integrates scheduling, event advertising, slide broadcast and a "question manager" that allows employees to "raise their hand" and ask questions.

The primary hardware features of an IP/TV solution:

- The Cisco IP/TV Broadcast Server which captures and streams live MPEG video programming
- The Cisco IP/TV Control Server which is the management component, for scheduling and controlling video on the network

Centra

This live e-learning platform provides a very close approximation of the classroom delivery model. It facilitates live collaboration through a software interface that presents visual, icon-based metaphors for most of the behaviors that are typical of a real classroom. This includes providing participants with the ability to “raise their hands” to ask a question or inject their own ideas into the classroom dialogue.

Also known as a “virtual classroom,” the Centra platform is playing a crucial role in the viability of contemporary learning because it reintroduces the instructor as an active agent in the learning process. It provides the platform for the key missing ingredient in e-learning, specifically pedagogical oversight and learner accountability.

Centra also provides a platform that accommodates a wide range of collaboration functionality. This platform enables large groups of dispersed employees, partners, and customers to interact, collaborate, and learn in real-time over intranets, extranets or the Internet.

- Integrated, multiway, full-duplex voice-over-IP (VOIP) audio conferencing
- Real-time, multipoint video conferencing
- The ability to place participants in multiple breakout rooms for team or individual lab exercises
- The ability to record live sessions in an industry-standard digital format that can then be subjected to post-production editing
- Application sharing, which enables leaders and participants to share any Windows-based program, including their entire desktop, or even one located on a remote server
- A forms-based capability to generate evaluations, quizzes, and surveys

gForce

One of the more vocal complaints levied against computer based training over the years is that it is expensive and takes too long to fully integrate.. This is due less to budgetary resistance to converting business curriculum to a computer-based delivery model than it is to a more fundamental shift in the dynamics of corporate knowledge-transfer.

As the pace of change continues to accelerate, one of the weakest attributes of business knowledge has become its perishability. A 1999 Harvard Business Review article reported that the base of business knowledge has become so short-lived, most efforts at codifying that knowledge are a waste of time. Thus, the real obstacle to converting knowledge assets to a computer-based format is the development cycle time, rather than the cost.

gForce provides a best-of-breed solution that addresses this problem. The gForce authoring platform is designed to enable experts to quickly capture their expertise on specific topics and then publish it to a widely accessible knowledge repository. Where traditional instructional design methodology separates subject matter experts (SMEs) from content design and development, gForce enables SMEs to contribute directly, using simple authoring tools and content publishing procedures.

By providing a mechanism for easy knowledge capture by experts, gForce not only facilitates a dramatically compressed content authoring process, but also encourages a heightened level of informal learning. When an employee exits a class, whether it is traditional or Web based, the process of learning does not end. There is a substantial distance between a new performer fresh from completing a course and an expert performer to whom others look for advice and mentoring. The gForce expert authoring and knowledge exchange solution supports workers as they strive to exploit the new knowledge-sharing environment of modern business to become expert performers.

Ninth House Network (NHN)

It is one thing to put video or other rich media on the network for training purposes. It is another to create broadband training content that exploits the rich interactive capabilities made possible by Web connectivity. Ninth House Network has achieved the latter with its leadership-training curriculum. As such, NHN provides asynchronous e-learning whereby workers can access a deep learning experience any time, anywhere.

To achieve the ambitions of asynchronous e-learning, NHN has developed an interactive broadband leadership curriculum that possesses the following key attributes:

- High-impact video segments that feature well-known SMEs
- Interactive sequences with a strong narrative component that deeply involve the learner in a decision-making capacity with the subject matter
- Intelligent student-tracking mechanisms that simulate the mentoring and guidance provided by instructors
- Curriculum components that include self-branding and self-management, situational leadership, partnership management, high-impact hiring, and managing projects for innovation

OutStart

OutStart provides a collaborative development, content management and dynamic delivery platform called Evolution. It assembles content created in Evolution or other products into the re-usable learning object repository to ensure content consistency and dramatically reduce time in course development. This highly-granular content repository enables the delivery of “just-for-me” training in conjunction with other Ecosystem products to maximize learner productivity. Evolution enables you to:

- Develop and assemble reusable learning objects in a distributive, collaborative team-based environment
- Manage and reuse content with extensive searching, versioning, customizable metadata management, object tracking and reporting
- Import, tag and manage legacy content
- Use template-based authoring to support your desired layouts, devices and instructional design approach
- “Author once, deliver many” to meet the needs of the audience and the delivery medium: Web, CD, print, presentation, mobile devices or offline viewing
- Support interactive review by subject matter experts as part of the development workflow

Deliver dynamic, individualized, prescriptive and adaptive e-learning based upon student profile (e.g. job role, language, preferred learning style, etc) and assessment and performance results

Saba

The analogy between ERP and learning management systems is now a very common one. The key attribute that justifies this analogy is a product vision that aggregates a broad range of functionality and data resources under a single statement of business mission. In the case of ERP, systems such as SAP and Oracle Financials enable large corporations to integrate their fiscal practices across diverse organizational units, driving costs out of the firm and achieving higher levels of operational excellence.

In the case of LMS, Saba provides the tools needed by executive leadership to systematically manage the development of their organization's human capital. Pursuit of this vision is paying significant dividends. A recent ASTD study concludes that firms that make relatively large investments in learning technology also score high marks in many areas of conventional business performance, such as greater profitability and total shareholder value.

The Saba LMS builds the foundation and scaffolding for human capital development by providing the following key features:

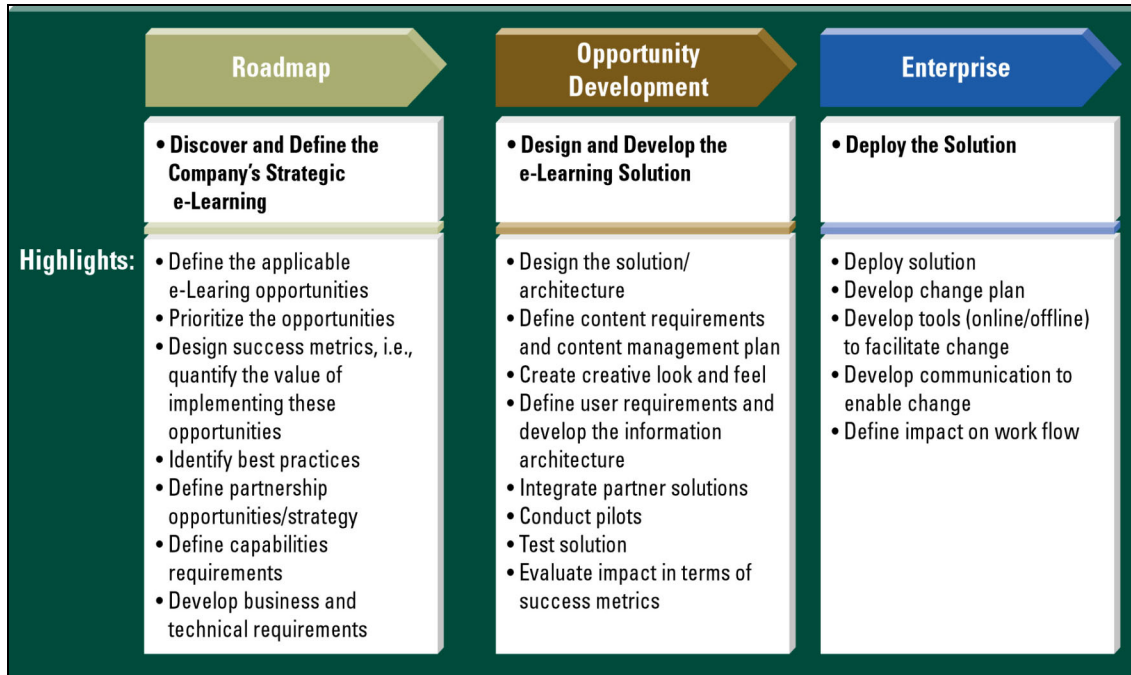
- Student registration to link corporate learners to curriculum-based learning resources
- Learning resource management (instructor-led courses, virtual classes, Web-based training, and soon, including the management of resource constraints)
- Progress tracking and reporting (both for/to individuals and groups)
- Personalized curriculum, including the management of learning paths and competencies, entry and reentry points (that is, bookmarking) and certification

iXL

Buying and installing single-function or single-topic e-learning applications results in an isolated curriculum event that can no longer be considered a viable target of e-learning. E-Learning must be viewed as a bundle of applications that address a range of business problems. Like its major IT counterparts, it is now an environment in which strategy and integration must be considered fundamental components required for implementing solutions.

As a pure services provider with a strong concentration in e-learning, iXL provides the ecosystem and its customers with strategy, implementation, and integration services. Figure 3 below presents iXL's high-level methodology for managing ecosystem implementations. The first stage emphasizes the creation of a road map and is a strategy offering that iXL often executes in conjunction with Cisco IBSG consultants.

Figure 3: iXL E-Learning Offerings Overview



This strategy offering helps organizations define the many opportunities that will drive both bottom- and top-line benefits now possible with e-learning. It helps them identify and then prioritize e-learning initiatives to create budgetary and planning projections and, perhaps most importantly, to define a set of metrics by which e-learning success will be measured in their particular business environment.

iXL integrates the various e-learning applications together and helps corporate sponsors gain traction with their upper management and user constituencies. IXL helps companies formulate e-learning strategy and build governance models that are capable of supporting enterprise-level initiatives. The company helps firms select tools and then integrate them with the overall IT fabric of their organization. And it assists companies in identifying, selecting, and sometimes building the content needed to stock their courseware libraries.

Putting the ‘System’ into Ecosystem

The very concept of an “ecosystem” is predicated on the existence of a set of organizing or governing principles. Without this set of governing principles, there is no ‘system’ in ecosystem and, as a consequence, the whole notion of an interacting set of related natural components falls apart.

In nature, ecosystems are environments such as coastal marshlands, deserts, and arboreal forests. Ecologists recognize them with a fair degree of consistency and can define their internal organizing principles in terms of such concepts as food chains, energy sinks, and climax species. Similarly, economists use governing economic principles to identify market ecosystems. The premise that there are organizing principles that identify and

help guide traditional ecosystem models is embraced by the eLearning Ecosystem as well.

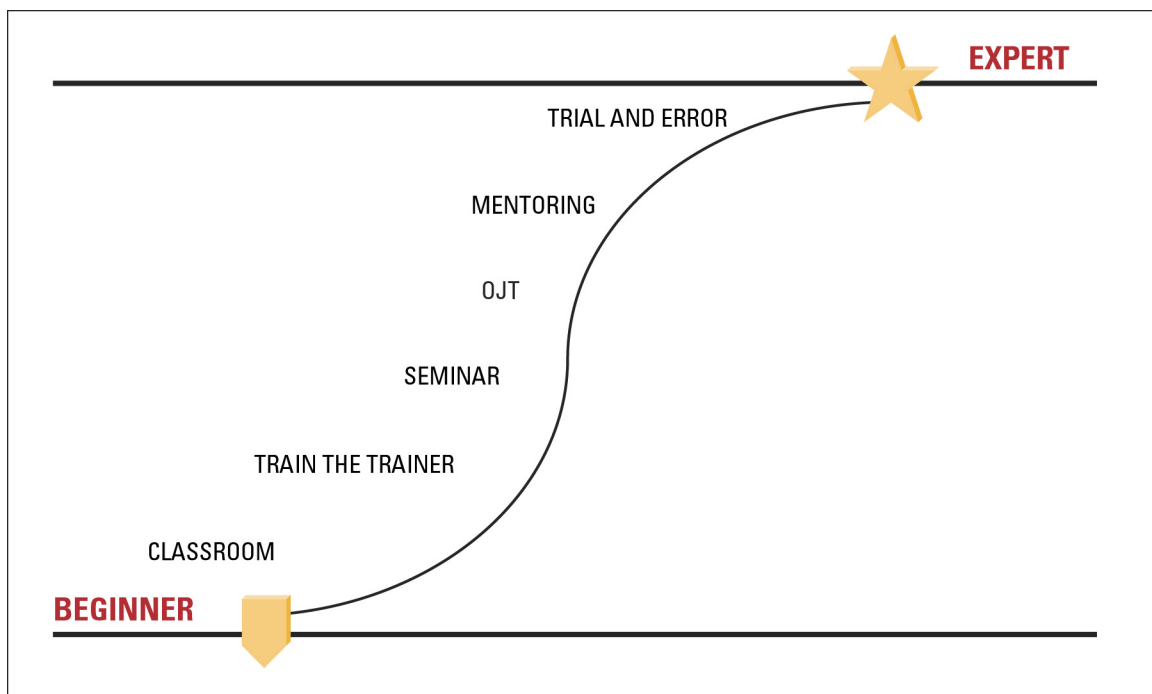
But just exactly what are the key organizing principles of the eLearning Ecosystem? In this section, three models are provided for helping us think about how the eLearning Ecosystem is organized: the E-Learning Curve, the E-Learning Value Matrix, and the E-Learning Waves of Adoption.

The E-Learning Curve

Nothing is more fundamental to the learning process than the “learning curve.” When we change companies, jobs, roles, or even projects, we must negotiate new and variously challenging learning curves. As we continue to come to grips with what it means to work in a knowledge economy, the significance of the learning curve as a pervasive component of the modern workplace is becoming more and more apparent. Increasingly, managing the modern corporation is becoming the art of managing multiple, overlapping, group, and individual learning curves.

The concept of the learning curve lays out a simplified model of learning in which knowledge of a given subject is acquired through a progression of steps. At the lowest levels of the curve, the learner is a novice who then progresses through various stages of increasing competency until reaching expert status. Though this model is a bit oversimplified, it bears up well under the task of being applied in numerous diverse contexts.

Figure 4: The Conventional Learning Curve

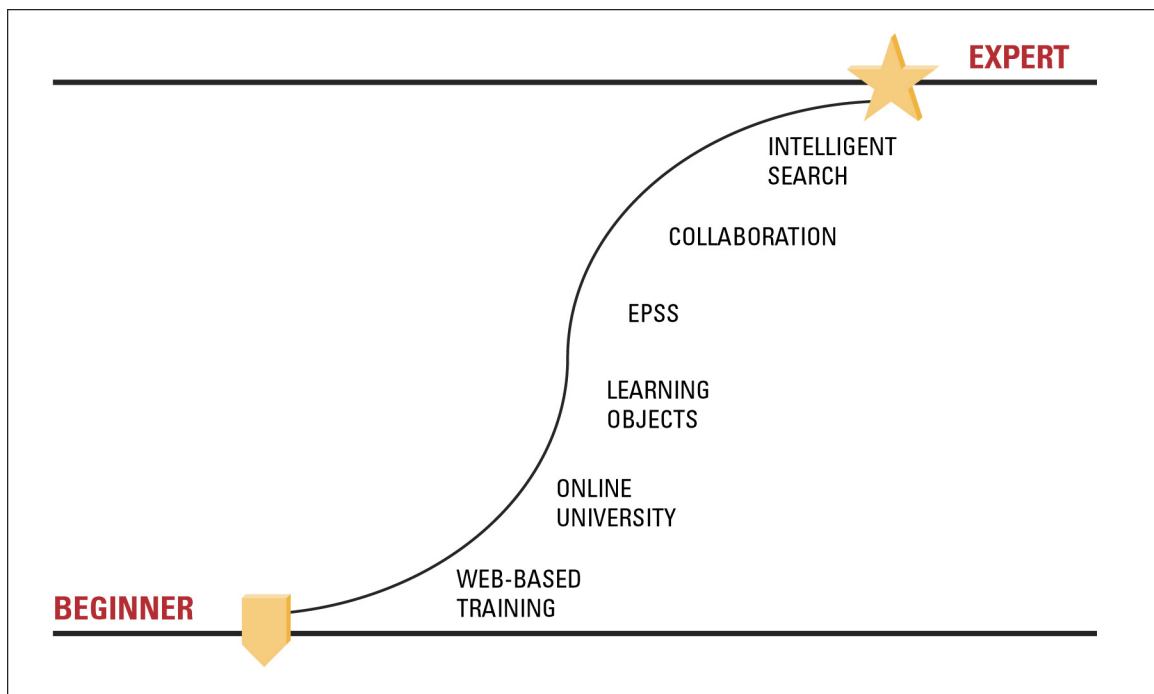


If we apply the notion of a conventional learning curve to the context of conventional modes of corporate learning, we find that the curve supplies an apt structure for understanding when and how different modes are employed. Figure 4 takes learners out of their typical work context during the earliest stages of the curve and puts them in a classroom or seminar setting. At this early point in the learning curve it is fair to say that the worker is not yet prepared to be a performer. These earliest stages can also be considered the “off-the-job training” segment meaning they are also the most expensive to the sponsoring organization.

As learners move up the curve, they move out of the classroom and into an on-the-job learning environment. As they approach higher levels of expertise, learners require more one-on-one or individualized approaches to learning. Because each worker has a unique set of knowledge and skill gaps separating him/her from the highest levels of expertise, it will take the mentoring intelligence of a live expert to detect and redress those gaps. Finally, as workers get even closer to becoming peerless experts, they will run out of coworkers upon whom they can rely for coaching and will need to resort to their own practices of trial and error to improve knowledge and skill levels.

Earlier it was noted that one of the recent maturational leaps for e-learning has been the recognition that no one form of learning technology is capable of addressing the diverse range of learning modality requirements found in the modern workplace. We labeled this leap of recognition “the blended solution.” If we position the learning technology components of our time along the learning-curve model, the logic of that blended solution becomes even clearer. The picture that is formed by this allocation of technologies along the curve is what we will call the “E-Learning Curve.” (See Figure 5.)

Figure 5: The E-Learning Curve



The analogies to the conventional learning curve are straightforward. Early in the learning process, workers using the conventional model of corporate training practices had to go off-the-job to attend classroom-based instruction. Workers in the e-learning model use hours-long modules of Web-based training curricula. For anyone who has ever prepared the return-on-investment (ROI) model of cost avoidance for Web-based training, this analogue between instructor-led training and asynchronous e-learning will be obvious. In both the conventional and e-learning cases, learners are taken out of their job context entirely. However, with the e-learning alternative, no travel costs or classroom resources are involved, strengthening the business case for deploying Web-based training.

As one moves up the learning-curve model, the allocation of learning technologies to points along the curve lead us to some interesting insights, including why a blended solution was so strongly needed by the market in the first place. With Web-based training, as with its manual counterpart in the classroom, the zone of applicability is actually quite limited. The only time it makes sense to pull workers off their jobs for training is limited precisely to those times when no other alternative will suffice. Off-the-job forms of training make good business sense only when workers are at the bottom of the learning curve and are not yet equipped to perform at any acceptable level of competence.

In the past decade, the corporate training market has experienced strong growth in various forms of just-in-time training delivery. This growth has favored technology-based forms of delivery because although the manual forms of performer- and expert-based learning support are prevalent, there is no systematic way to manage or direct them in the absence of technology. In fact, it would probably be safe to say that there is no effective way to manage any portion of the learning curve that lies above its lower-middle portions without the presence of an extensively deployed network environment.

In order to provide real learning support to workers after they become performers, it is necessary to know something about what they are doing from moment to moment. That type of knowledge can be obtained only in an environment characterized by pervasive connectivity, which is now taking shape in the corporate world through extensive deployment of intranets and portals and the learning support technologies that exploit pervasive connectivity. Intranets and portals are evident all along the middle to upper portions of the e-learning curve.

It should be noted that each of the technologies presented in the e-learning curve graphic has its own range of applicability with respect to the learning curve, rather than the crisp boundaries implied by its position in the graphic. However, for the purposes of this discussion, the positioning will be considered appropriate.

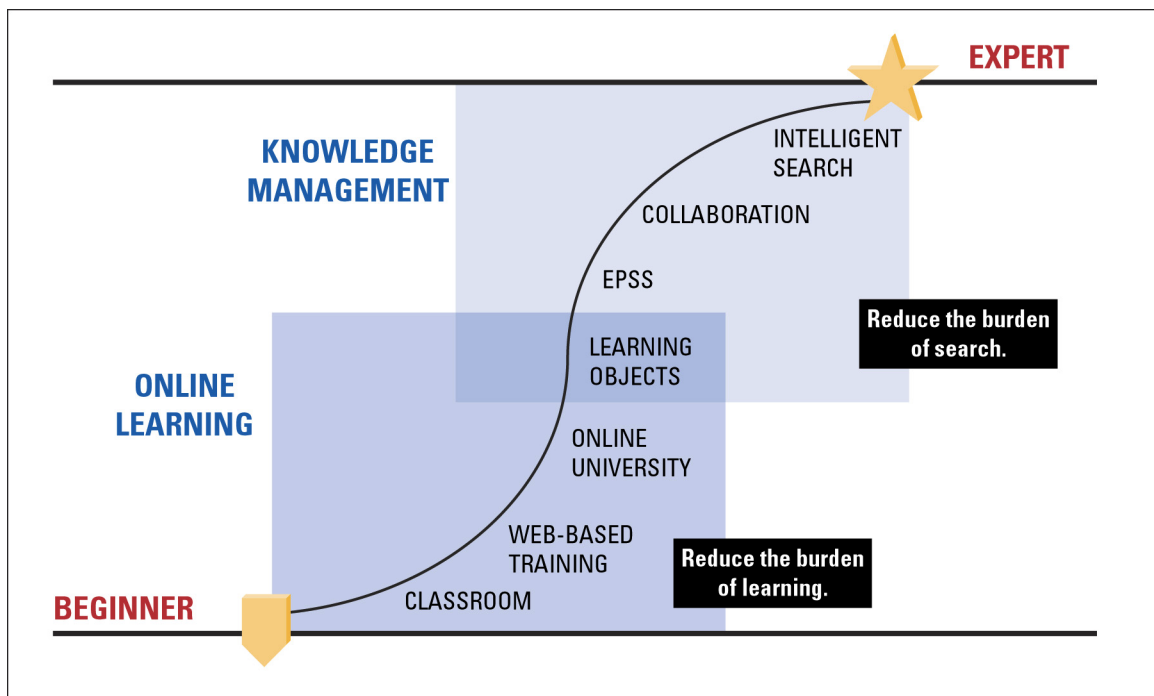
As workers move up the e-learning curve, they quickly leave the relative isolation of pure asynchronous courseware. Initially, they enter the more richly supported environment of the online university, backed by an enterprise-level learning management system. The

virtual classroom provides a classroom environment and a technology that accommodates more collaborative modes of learning, as well as forms of content delivery that are capable of responding to rapid changes in business context.

As one moves into the upper half of the e-learning curve, another interesting set of insights becomes evident. First of all, we see a progressive shift to just-in-time forms of learning support. For example, we see the concept of learning objects positioned at the midpoint of the curve. Learning objects are segments of Web-based training content repurposed or entirely redesigned for just-in-time delivery. They are far more granular than traditional WBT content and are capable of being resequenced on the fly to meet individual learner needs.

As we move even further up the e-learning curve we encounter yet another interesting revelation. Most of the learning technologies at this end of the curve are not generally recognized as “learning” technologies at all. Rather, such items as collaboration tools and intelligent search are more typically thought of as knowledge management technologies. Deploying and utilizing these types of tools are what differentiates an employee from a “performer.” (See Figure 6.)

Figure 6: Knowledge-Management Performer

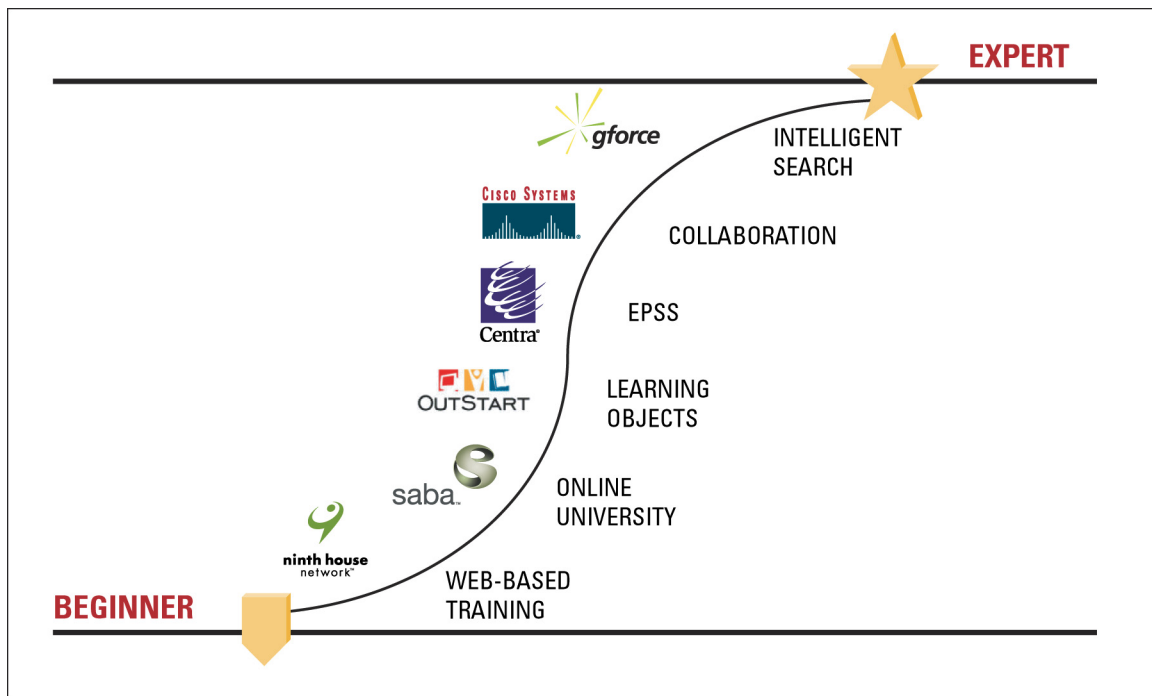


The distinction between e-learning and knowledge management is actually quite controversial. They have originated in different disciplines and so have different sets of practitioners. Yet, as the e-learning curve shows, they are both devoted to the same basic proposition of enabling knowledge-transfer. They simply lie along different portions of the learning curve.

Thus, as we think about the composition of technologies that go into building a blended solution, the most robust perspective will provide coverage for the entire extent of the curve. A comprehensive eLearning Ecosystem will have technologies that enable both online learning and knowledge management.

As Figure 7 shows, the e-learning ecosystem does provide full coverage of the e-learning curve. Although they are in correct relative order and provide coverage of the curve, each of the vendor products covers a far broader range of the e-learning curve than this graphic implies.

Figure 7: The E-Learning Curve & Ecosystem Vendors



Ninth House – As high-end, broadband courseware, the Ninth House offering is designed to deliver the benefits of fully asynchronous e-learning. It delivers a deep learning experience that can be taken at any time and without any assistance. Though it is not reflected in the graphic, Ninth House has also created a form of highly granular content library called Instant Advice within its overall curriculum that would place the company’s offering in the upper half of the curve. The knowledge objects comprising that library are no longer than three minutes in duration and are designed to be consumed in a just-in-time fashion.

Saba – As the learning management backbone, Saba provides the foundation for the entire lower half of the e-learning curve. The Saba LMS provides registration and scheduling services for all in-advance forms of training, including both ILT and WBT. It launches WBT content and can handle learning objects as well. Saba also allows for the management of skills and competency gaps in the organization. This setup enables

companies to measure overall top - and bottom-line performance based on the competencies in their organizations.

OutStart – With its learning object development, management and just-for-me delivery platform, OutStart is based in the center of the e-learning curve but extends in both directions for integration and delivery purposes. OutStart can integrate courseware from existing Web-based training and can assemble and deliver learning objects to a variety of mediums such as the web, print, presentation and wireless devices as well as delivering to collaboration tools and virtual classrooms. OutStart can further improve the learner's experience by enabling the simple and efficient creation and delivery of prescriptive and adaptive learning content.

Centra – Though focused in the lower half of the curve, where live e-learning is predominantly used as a substitute for ILT, Centra also extends into the upper reaches of the curve, where it performs as a collaboration tool. In the upper half of the curve, knowledge life cycles tend to be far shorter than they are in lower half. Performers and experts operate in an environment where tacit knowledge holds the key to accelerating business processes and conventional wisdom is highly perishable. In this context, Centra performs an extremely valuable role as a proxy for face-to-face meetings.

Cisco – As one moves up the learning curve, a gradual shift occurs along several dimensions in the way that learners seek to obtain new knowledge. In-advance learning gives way to just-in-time learning. Long-duration learning sessions give way to more compact bursts of knowledge-transfer. Stable sources of codified knowledge are replaced by informal sources. As one moves even further up the curve, the knowledge base often becomes so dynamic that the only valuable sources are the thoughts and reflections of experts. With its IP/TV[®] network video solution and Cisco Collaboration Server (CCS) products that provide “click-to-talk” functionality, Cisco Systems offers numerous solutions that address knowledge transfer for corporate communications or corporate learning needs as one passes through the inflection point to the upper half of the e-learning curve.

gForce – More than any other member of the ecosystem, gForce provides products that belong to knowledge management with a toolset that addresses many of the core business issues that lie at the heart of knowledge management. Knowledge sharing, the capture of tacit knowledge from experts, and intelligent search are among the most important business issues handled by this company's products. gForce Author enables experts to augment PowerPoint decks with synchronized audio and video, thereby creating rich multimedia knowledge objects with a relatively small increment of additional effort. Knowledge Exchange provides a strong repository management backend, thereby facilitating intelligent access to a firm's store of codified knowledge. gForce makes a strong contribution in the upper half of the e-learning curve.

In summary, it bears noting that no part of the e-learning curve is more important or valuable than any other. Depending on individual circumstances, each company or business unit may at certain points in time find one segment to be more important than another, but there is nothing inherently more significant about one portion when

compared against the others. They all add distinct business value to the e-learning curve, and specifically to the eLearning Ecosystem.

For example, to the company that is experiencing rapid growth or the less fortuitous challenge of high turnover, the emphasis will be near the bottom of the curve where new-hire training will likely capture the greatest attention. For firms that are reengineering some of their key business processes, experienced employees will find themselves reskilling somewhere along the middle portions of the curve. And for those stable companies or business units that occupy stable markets, most of the key learning differentiators will occur near the top of the curve. This is where peerless expertise is often the only ticket to competitive success and where the inevitable flow of market perturbations cause even the most senior professionals to intermittently slip a few notches from the top of the curve.

The eLearning Ecosystem provides complementary solutions along the entire extent of the e-learning curve. Although there is some overlap, the business value of each member's offering lies at a different juncture of the curve, providing a complete, blended e-learning solution. Thus, the e-learning curve, with its fundamental and pervasive conceptual properties, provides the first of our two models for putting the *system* in ecosystem.

The E-Learning Value Matrix

Recall that one of the central themes of the eLearning Ecosystem is that it offers a mechanism for helping the learning industry achieve a goal that it has repeatedly failed to obtain. A very important goal of the eLearning Ecosystem is that it makes available many of the key enablers and catalysts needed to propel the e-learning industry from its decades-long stasis in adolescence to full maturity. To do this, these enablers and catalysts must result in actions that lead to enterprise-level implementations and those implementations must contribute to significant, measurable differences in business outcomes.

This is no small feat and requires concerted action. More specifically, it will require new forms of executive-sponsored governance, unprecedented in the history of managing the corporate training and education function. Our second systemic element is a prescriptive one. It is designed to provide executives with a model for managing the increasingly critical function of knowledge-transfer across the enterprise.

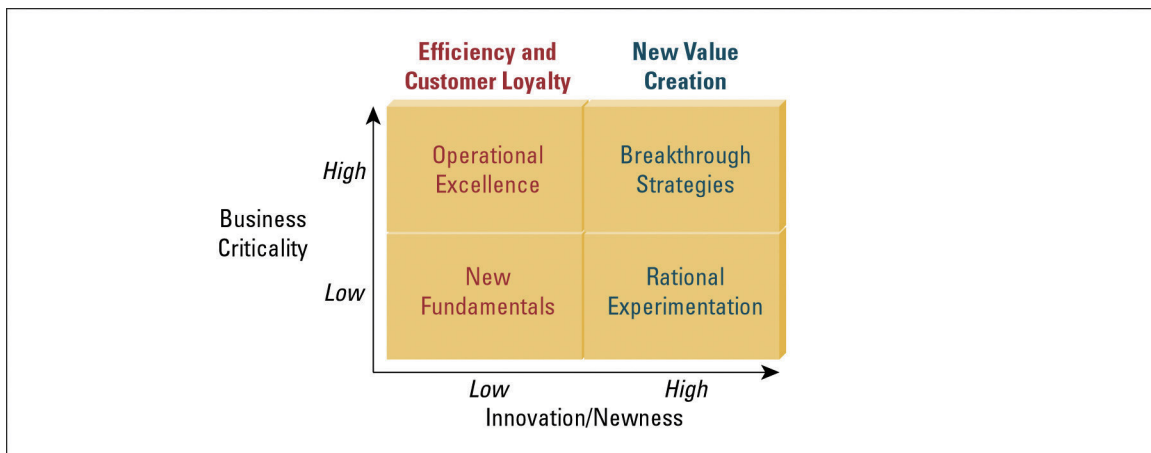
In their important book, *Net Ready*, Hartman and Sifonis provide numerous models and concepts for effectively managing large-scale e-business initiatives. For our second systemic ecosystem element, we will adapt one of their more prescriptive models from a general e-business context to one that is specific to e-learning. The model we have chosen is particularly significant because it strikes at one of the most stubborn barriers confronting the enterprise-level implementation of e-learning—the ability to conceptualize multiple, complementary, and synergistic learning technology projects.

In *Net Ready*, Hartman and Sifonis offer an assessment instrument for evaluating the impact of e-business projects. Useful in its own right, this instrument holds even more than its originally contemplated value in the e-learning market, where it stands as a particularly *mature*—and therefore timely and relevant -- perspective on how to view an application domain.

The basic premise of e-business value matrix is that a corporation needs to view its e-business initiatives as a portfolio of projects or even as a portfolio of investments. As such, they need to be considered as a group and must be managed in such a way as to spread their risks and benefits across a well-defined range of possibilities. That is, rather than making project and technology selection choices in an “ad hoc, opportunistic, and chaotic manner,” organizations need to distribute those choices in a fashion that spreads their risks, while covering a range of benefits. The similarity to the portfolio diversification strategies that characterize the management of mutual funds is intentional.

To help define the range of e-business opportunities that companies need to contemplate, the authors have created a conceptual space they call the e-business value matrix. The two dimensions that frame this space are practice innovation, or newness, and business criticality, which is also a proxy for degree of risk-reward. (See Figure 8.)

Figure 8: E-Business Value Matrix



New Fundamentals – In this quadrant, the business criticality and innovation are low. Projects falling into this quadrant will typically involve the webification of existing tactical applications that tend to be of a less critical nature. The authors use the example of creating an intranet-based version of the company’s internal phone directory as an example of the type of low-risk project that falls into this category.

Rational Experimentation – Projects falling in this quadrant are typically ones that are seeking to create new markets and revenue growth but in areas that are not mission critical. Most importantly, though this quadrant is customer-facing, it represents initiatives that, if they fail, will not do appreciable damage to the sponsoring organization’s customer base.

Operational Excellence – This quadrant involves projects that drive existing business processes toward mission-critical applications. The goal of projects in this quadrant is clearly transformational and often focuses on wrenching costs from supply and demand chain processes. Though it is not always the case, initiatives in this sector tend to be larger in scope than those found in the bottom half of the matrix.

Breakthrough Strategies – This is the most dramatic quadrant, the space where organizations attempt to redefine and redirect their markets. Initiatives that fall into this quadrant tend to be customer-facing and seek to create new standards for how business is conducted in a particular industry. Several of the best-known pioneering efforts on the Web fall in this category, such as eBay, E*TRADE, and Travelocity.

Figure 9: E-Business Value Matrix / Strategic Options

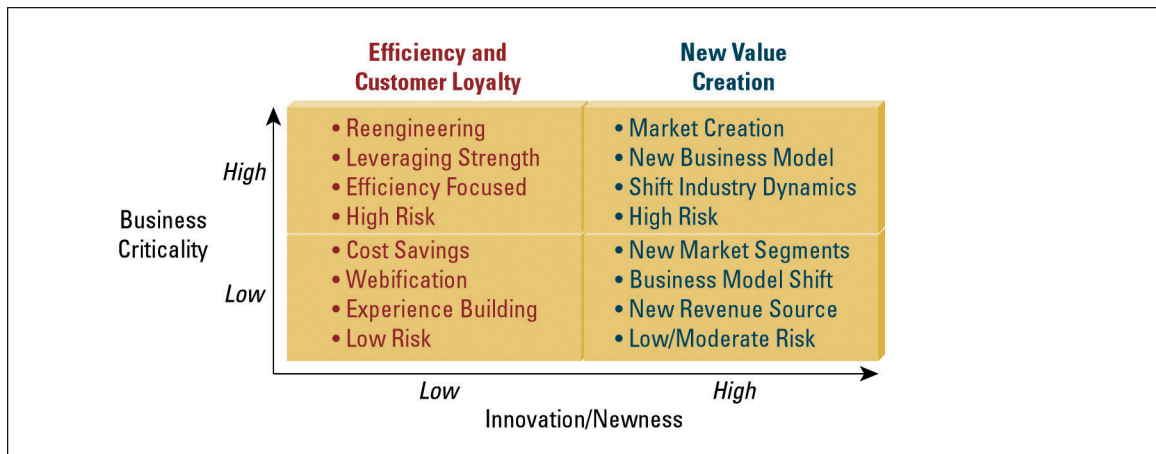
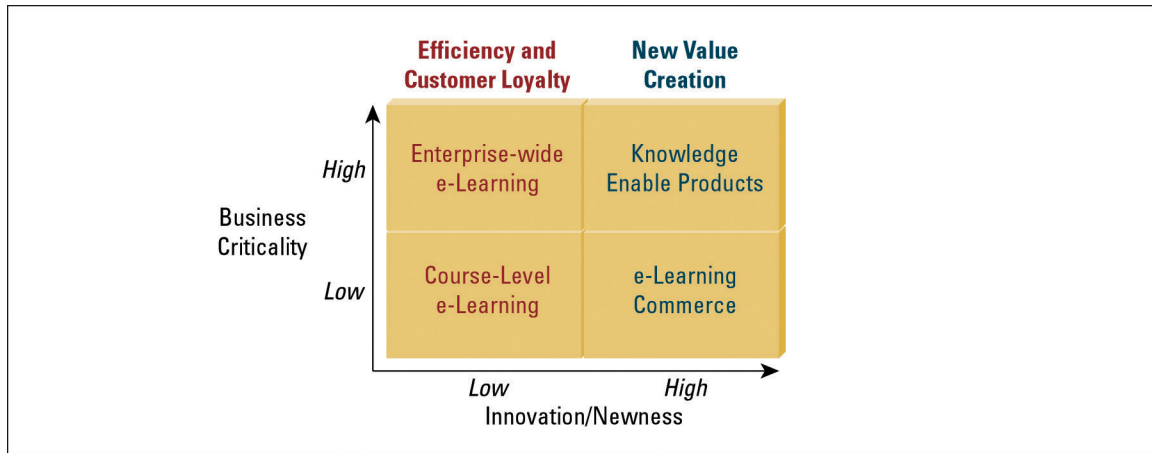


Figure 9 provides another level of detail regarding how Hartman and Sifonis view the e-business marketplace. Again, though we cannot do this model justice here (refer to Chapter 3 of *Net Ready* for a more complete discussion), one more key distinction needs to be made before moving on to the e-learning incarnation of this matrix. It is already evident that projects on the top half of the matrix are riskier in nature. However, it is also important to note that projects that lie on the right-hand side of the matrix are focused on new value creation and top-line benefits, whereas projects that lie on the left-hand side are oriented toward greater efficiency, and bottom-line benefits.

Figure 10: E-Learning Value Matrix

Some examples from the e-learning industry fall into all four quadrants. Most e-learning projects are implemented to achieve efficiency and bottom-line benefits thereby aligning with the left-hand side of the matrix—and particularly to the lower left-hand quadrant. Companies that are leading in their adoption of e-learning are crossing over to the right-hand side of the matrix, undertaking initiatives in more than one or two of the quadrants.

The e-learning value matrix shown in Figure 10 provides an extremely valuable model for considering and discussing the totality of opportunities that are the domain of the ecosystem. As such, it also provides a framework for understanding the underlying forces that will shape the eLearning Ecosystem as it impacts the corporate training function. The four quadrants of the e-learning value matrix follow:

Course Level E-Learning – Falling into the New Fundamentals quadrant, this space represents the entry point into e-learning for most corporations. Typical projects involve course-by-course content conversions from instructor-led formats to either Web-based training or virtual classroom, or even a blended solution featuring both. Particularly for firms with large IT shops, it will also often include application-specific performance support systems, which can also be characterized as context-sensitive, online help systems.

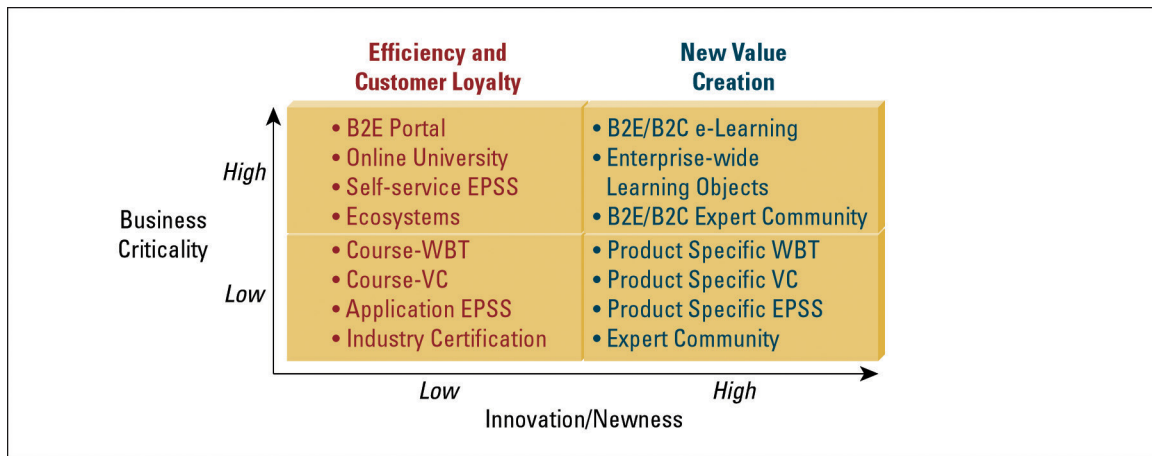
E-Learning Commerce – Falling into the Rational Experimentation quadrant, this space represents the point at which firms experiment, usually in fairly small ways, with selling instructional content across the corporate firewall. In the most typical cases, these offerings will be for product training, and often the pricing of that training will disappear behind “other considerations,” such as compensating for a lower customer discount. As with its counterpart on the e-business side, this quadrant will not involve risky endeavors. Thus, the initiatives in this space will often go out as redundant offerings, used initially to back up traditional classroom instruction.

Enterprise E-Learning – Corresponding to the Operational Excellence quadrant, this space is predominantly represented by initiatives that take e-learning to a larger scale,

often to the level of an entire division or even the whole enterprise. The online university is the modal case, though the Web university is increasingly being rolled into an even larger set of aggregated applications, most typically represented by a B2E (business-to-employee) portal. It is in this space that we get the first look at a context that warrants the entire range of functionality encompassed by the eLearning Ecosystem. At a minimum, entry to this quadrant would require a robust, full-functionality implementation of an LMS, such as Saba.

Knowledge-Enabled Products – In *Third Wave*, futurist Alvin Toffler was the first to identify one of the definitive moments in the evolution of the Information Age. Toffler said that it would be the point at which traditional industrial corporations begin to reap greater value from what they know about what they produce than they do from what they actually produce. In a sense, this quadrant is the embodiment of that vision. Corresponding to the Breakthrough Strategies quadrant, this space is reserved for those initiatives that seek to elevate knowledge-transfer not only to a major income, producing opportunity but also to the point where the knowledge-transfer features of a product line represent their key competitive advantage. One pioneering example that comes to mind is the customer education portal for online brokerage created by Charles Schwab.

Figure 11: E-Learning Value Matrix Offerings

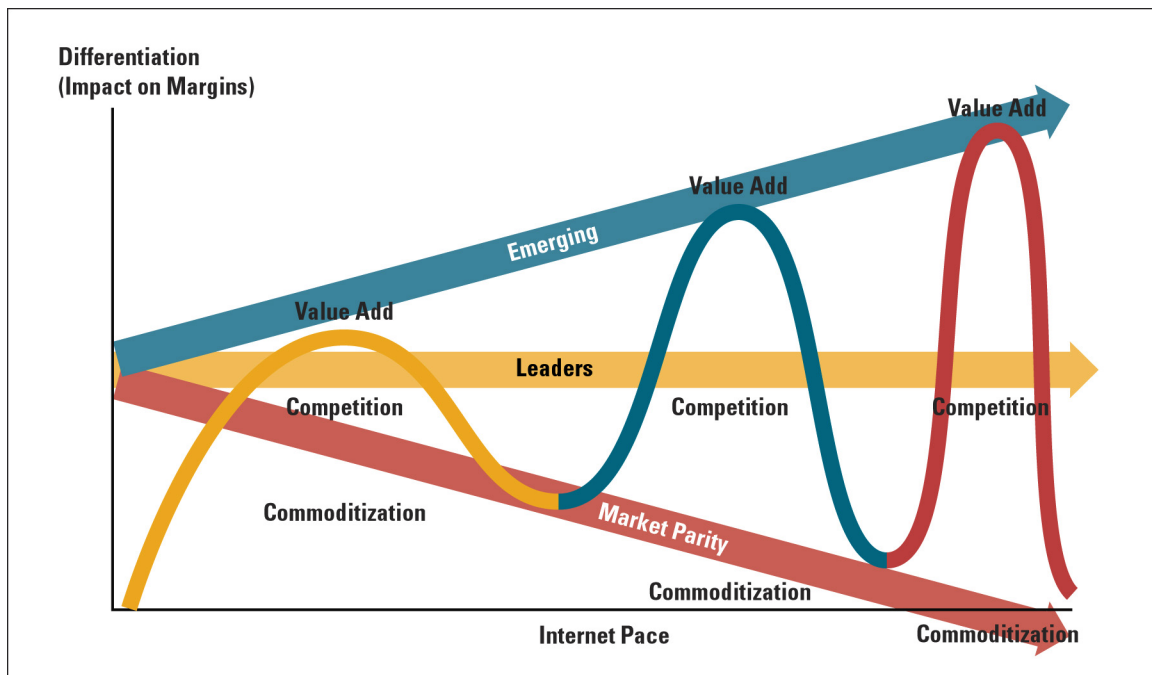


To Summarize, the e-learning Value Matrix in Figure 11 provides a model for visualizing the organizational context of enterprise-level e-learning. It may also serve as a governance tool for managing multiple e-learning projects, providing knowledge-transfer executives with an instrument for gauging the degree to which their organization is responding to the full range of opportunities made possible by learning technology. The prescriptive premise of that governance tool is that firms should have at least one active project, or initiative, in each quadrant. Though it is not the case today, when most Global 1000 firms have simultaneous e-learning projects in every quadrant, this will signal that the leap to maturity has been successfully traversed.

The E-Learning Waves of Adoption

No matter how sudden or auspicious their appearance, all technologies are adopted in stages. Far-reaching and broadly defined technologies, such as e-learning, are typically adopted over a series of stages. Each individual phase can be associated with a group of independent but interrelated technical elements, as well as a host of correlated social and cultural components. These larger historical phases are often referred to as “waves,” and will often follow the basic sequence of initial value-add, followed by competition and finally, commoditization.

Figure 12: Adoption Waves for Technology



In the model depicted in Figure 12, large-scale technology adoptions, what might be referred to as “domain technology adoptions,” typically occur over three separate but cumulative waves. The amplitude of these waves gets sharper and steeper with each successive cycle, in large part because there is greater general awareness and knowledge of benefit and, therefore, less resistance to adoption. There is also a cumulative impact that propels each successive wave to greater heights of value-add, even as it leads to deeper troughs of commoditization.

It is important to realize that, whereas the adoption wave model depicted in Figure 12 implies a strong chronological dimension, this is not a waterfall conception of reality. That is, this model does not require that each cycle of the wave play itself out completely before the next one starts. Instead, it is based on the notion that although each wave will clearly begin and reach the full maturity of its form and attributes before its next successor, all three waves are apt to be in motion simultaneously. As you apply this

model to the reality of market data, you will discover all three waves in motion at once but with the earlier waves being much further into their life cycle than their successors.

Based on research conducted by the Cisco Systems IBSG , it is possible to identify with a fair degree of specificity all three of these waves as they relate to e-learning. These three waves have been entitled Market-Parity, Market Leader, and Emergent, respectively. Through its numerous customer relations, IBSG has been able to identify sets of firms that are at each of the three stages or waves. More relevant to our discussion of the eLearning Ecosystem, vendors have been able to identify the primary attributes that characterize adopters of e-learning at each wave.

Figure 13: E-Learning Waves of Adoption

Internet Capability	Network Effect
Management Catalog, registration, and tracking Knowledge transfer Package content and virtual classroom	Centralized access point for resources Reduced administrative and travel costs
Management Skills and competency administration Knowledge transfer Multi-media, IP/TV and enterprise-wide	Empowered manager and employee Improved development and productivity
Management Human capital and extended enterprise Knowledge transfer Just-in-time, personalized and anywhere	Increased speed to optimal performance Accelerated competitive advantage

For corporate practitioners of e-learning, this model is a very important one for helping to build a deeper understanding of the functionality represented by the ecosystem. Because the characterizations of each wave are based on general observations of actual market trends-of actual market implementations of e-learning-this model balances the high-level models discussed thus far with a strong element of ground truth. As companies have renewed their keen interest in instructional technologies with the advent of the Web, the e-learning waves of adoption model presents a realistic picture of how firms are applying Web-powered solutions as they strive to achieve enterprise-level, high-caliber business results with their e-learning investments.

Market-parity – For the present era of Web technologies, this represents the initial wave of adoption for e-learning technologies. Firms that exhibit the adoption patterns and behaviors characterized for this wave are in step with the market place. They are not market leaders, nor are they laggards. However, firms that have not obtained this level of adoption may certainly be considered as trailing the market. Firms in the first wave of adoption for e-learning will exhibit many of the following characteristics:

- *For learning management* – They will be implementing against a strategy that is focused on the digital reemergence of very basic administrative functions. These functions will create a catalog of learning resources, handle registration for classes (both ILT and WBT), and provide the basic tracking of attendance, augmented by the logging of limited and simple performance data (for example, pass/fail). The business focus is on providing centralized access to learning resources.
- *For knowledge-transfer* – For industry-standard curricula, market-parity adopters will focus on using packaged, third-party content. Very few in this wave have any aspirations for developing custom interactive courseware, through either insourcing or outsourcing. For subject matter that is unique to the firm and that demands some form of custom development, market-parity adopters will tend to use the less-involved route offered by virtual classroom technology. This class of adopter focuses on reducing travel costs but is not committed to making the investments required to build anytime/anywhere, interactive content.

From an ROI perspective, the thrust of parity adopters is cost savings. When a firm implements the baseline functionality of an LMS, it is substituting more efficient methods of managing its learning resources. It is cataloging for the first time sources that have been fragmented, duplicated, and underutilized. They are providing newly digitized business processes for registration, enrollment, and attendance and so is achieving new levels of operational proficiency.

Similarly, when firms implement virtual classroom technology for the first time, they are significantly reducing the travel-related costs associated with their training function. When they go further and make extensive use of packaged, asynchronous courseware, they also reduce or even eliminate the costs associated with instructors and facilities management. In today's market, parity adopters are focused on the cost reduction benefits of e-learning.

With respect to the e-learning curve, market-parity adopters tend to focus on the bottom half of the curve, that is, on the traditional corporate training space. They will typically not yet have demonstrated any commitment to using technologies that drive the top half of the curve. If their firms have any knowledge management initiatives under way, those initiatives will tend to have different executive sponsorship and will not usually be integrated in any meaningful way with e-learning technologies.

With respect to the e-learning value matrix, market-parity adopters will tend to focus on the left-hand side of the matrix where the emphasis is on driving operational efficiencies and cost savings. Market-parity adopters are strongly committed to bottom-line results and will not yet have shown much inclination to use e-learning to drive any topline benefits.

As the label suggests, market-parity signals when most of the market has adopted or deployed this Internet capability. After an e-learning application or solution is widely adopted, that Internet capability becomes a commodity. When a new idea becomes

standard business practice, adopting companies cannot enjoy the once promised competitive edge, and all companies compete on the same level playing field. To be competitive, adopter companies need to deploy initiatives that will provide enterprise-wide abilities and skills necessary to outpace competitors, keeping one step ahead of the pack. The advantage new adopters have today is the ability to "leap ahead," moving beyond market-parity directly and adopting leading applications to quickly outpace their competitors. Today through the ecosystem, a new adopter can target an enterprise-wide deployment while simultaneously deploying targeted "early-win" initiatives and become a market leader.

Market Leader – As early adopters of e-learning begin to mature, they undergo a key transformation in their approach. In essence, they begin to adopt a more holistic perspective on e-learning, consistent with the migration from point solutions to enterprise-level environments. They become far more comfortable with, and begin to act upon, many of the more far-reaching benefits of e-learning. For example, they will initiate multiple learning technology projects and more importantly, will manage them as a portfolio of initiatives consistent with the e-learning value matrix.

In the current Web-powered environment, the jump from market-parity to market leader is best characterized as the move from point and departmental solutions to the creation of enterprise-level environments. More specifically, this key transformation is typified by the following:

- *For learning management* – The LMS implementation moves beyond the simple administrative tasks associated with managing employee learning to the far more committed proposition of managing employee skills and competencies. The scope of this move should not be underestimated. It represents the first time in business history when knowledge and skills become a visible, and therefore manageable, aspect of corporate life. Employees are given the tools to manage their professional growth, while management is finally empowered to create effective strategy for governing the direction of their organization's knowledge base.
- *For knowledge-transfer* – The firm's approach to the creation and management of electronic content also becomes far more committed. There is usually, for example, a commitment made to higher-bandwidth forms of e-learning content. Asynchronous courseware will often take on more of a multimedia dimension. Off-the-shelf acquisitions will tend toward richer and better-designed material, such as that published by Ninth House. Live e-learning will often make use of such broadband tools as the Cisco IP/TV Solution.

It is important to note that much of this heightened investment in electronic content is justified by the data connectivity between the content and the skills dictionaries that have been produced to manage the firm's knowledge base. Just as the construction of a skyscraper is made feasible by the development of a nearby subway station, investments in the more sophisticated forms of learning management build infrastructure that creates a value-generating feedback loop between rich content repositories and the people they serve.

From an ROI perspective, market leaders are motivated by opportunities to build a more productive workforce. For example, market leaders are making investments in skills and competency management, thereby making the knowledge base of their companies visible for the first time. This, in turn, makes it possible for managers to guide the learning activities of their employees and for workers to understand where their critical skill gaps lie. For market leaders, e-learning provides a mechanism for aligning business goals with learning initiatives and for stimulating expertise-driven efficiencies across most, if not all, business processes.

The jump from parity to leader bolsters a firm's commitment and execution at the bottom end of the e-learning curve, but does not necessarily lead to the integration of knowledge management with e-learning. In most organizations, the two ends of the curve remain separate, governed by different sources of executive leadership, with the initiatives being managed by different organizational entities.

However, even though knowledge management remains a separate domain, the investment in skills and competency management made on behalf of building a more robust LMS creates an infrastructure component that must ultimately exert a strong pull on the activities that characterize the top end of the learning curve. The ability to provide precision retrieval, is one of the dominant themes of knowledge-management, and end users can benefit in significant ways by having access to an information "store" that serves up content based on individual skill profiles, skill gap analyses, career goals, and the like.

With the possible exception of firms that begin making use of electronic content to provide customer training, the move from parity to leader does not typically lead to a corresponding move from the left to the right side of the e-learning value matrix. However, within the left side of the matrix, there is a shift from the lower to the upper quadrant, representing the jump to an enterprise-level commitment to e-learning.

Emerging – In the penultimate adoption wave, no less than three major changes in perspective occur. First, the enhanced valuation of employee skills and knowledge is raised to an even higher level, entering the boardroom under the conceptual framework of "human capital." During this emerging phase, executive sponsorship, with its attendant understanding of the value proposition, reaches its zenith.

Secondly, in concert with that elevated awareness, there is a newly formed desire to apply e-learning resources to the extended enterprise, and particularly to the various customer-facing processes that drive top-line revenue. Finally, there is also a dawning recognition that e-learning and knowledge management belong under the same tent. All aspects of knowledge-transfer are viewed as being part of the same fundamental set of human processes.

Firms entering the third wave of adoption are making innovative, though sound, uses of e-learning technology, while operating from an expansive, though coherent, strategic

perspective. Some of the more important features of the emerging wave of e-learning adoption include the following:

- *For learning management* – The demands of the knowledge management style of learning delivery impose a near-revolutionary set of changes on the back-end, learning management function. In particular, new repository management strategies must be conceived and implemented such that content objects and learners share the same data model. Personalization in the areas of learning and knowledge-transfer requires that learning needs (that is, skill and knowledge gaps) and content attributes (that is, topics, objectives) be described from a shared vocabulary, or taxonomy.

In other words, to enable just-in-time and personalized modes of delivery, all electronic content must be indexed and it must be indexed using the same semantics or taxonomy used to assign attributes to the learner population. Thus, if a learner has a demonstrated knowledge gap, the language used to describe that gap will also have been used to tag the specific content objects that will most expeditiously help the learner close that gap. This uniform metadata model is the only sensible route to enabling a precise matching of content objects to context-specific learner needs. When it comes to personalization, precision matching of content to learner need is by far the most important system objective.

But the data integration needed to achieve precision retrieval is never easy and will face some stiff challenges in the e-learning space, where the publishing industry model for content creation ensures that there will always be a great diversity of authoring sources. The catch here is that under current market conditions each individual authoring source (for example, courseware publisher, business partner or internal department) will likely be marching to the beat of its own indexing strategy. When indexing their knowledge assets, it is highly likely that these different sources will be using their own, markedly different vocabularies.

- *For knowledge-transfer* – Knowledge management and e-learning need to be merged into the same application domain. There is a strong shift in emphasis away from in-advance modes of instructional delivery and toward just-in-time and highly personalized kinds of learning. This is a very significant paradigm shift that changes just about everything having to do with electronic content. Content must now be broken into small, reconfigurable slices that can be delivered on –the job, rather than as part of a distinct “learning event.” Workers now operate in an environment in which almost all learning is done onsite, in the flow of the job, and is only rarely, if ever, delivered as part of a separate, classroom-like event. Even near the bottom of the e-learning curve, knowledge-transfer occurs predominantly in a just-in-time, on-the-job mode.

The Extended Markup Language (XML) revolution, with its great emphasis on sharing common professional vocabularies, will be key to making industry-wide data-integration a reality. In today’s market, the data-integration capabilities of XML are beginning to appear through a new breed of authoring platform called Learning

Content Management System (LCMS).

The LCMS will feed content directly to the sponsoring organization's LMS, providing a means of indexing content objects completely in step with the firm's overall corporate taxonomy and business processes. As a result of having better-organized repositories, knowledge workers will search less to discover more. This, in turn, will lead to compressed cycle times wherever the combination of e-learning and knowledge management is applied. In particular, firms that make the appropriate investments in these emerging technologies will experience compression in their product development and sales cycles.

From an ROI perspective, emergent adopters focus on creating competitive advantage. They understand that mind share drives market share, and not vice versa. They know that e-learning can do much more than help solve internal performance problems. They believe and have proven that e-learning technologies can be used as a competitive weapon not only to bolster the sales of existing products, but also to generate new sources of revenue. When emergent adopters contemplate ROI, they think in terms of taking advantage of their investments in e-learning to generate new and profitable sources of revenue.

As the state of repository management and precision retrieval continues to mature, so too will there be progress toward the unification of the e-learning curve. This scenario will lead to an enormous boost in productivity, particularly for knowledge workers. It will enable everyone to close their knowledge and skill gaps more quickly and to possess of systematic procedures and tools for making better, more informed decisions.

For example, under this emerging model, best practices will be identified, captured, indexed, published, managed, and recommended using common vocabularies that are defined across broad communities of professional practice. Learners at the bottom end of the curve will access the same repositories, using the same search and retrieval infrastructure as those who are near the top end of curve. The specific types of content that get delivered will, of course, vary significantly as one moves from one segment of the curve to another. But for the organization that adopts these emerging technologies, the entire user will exploit the same basic knowledge-capture, repository-management, and user-access resources.

Another major change for the emerging wave of adoption is the move from the left-hand to the right side of the e-learning value matrix. As content-creation and repository-management strategies become integrated along the entire extent of the learning curve, they also become more tightly integrated with the firm's other business processes, including those that are customer facing and responsible for driving top-line revenue.

Thus, third-wave firms will implement e-learning technologies that provide the sorts of solutions presented in Table 1:

Table 1: Sample Emerging Wave Solutions

Solution	Description	Benefits
eService Performance Support	Embedded performance support providing on-demand and context-sensitive forms of just-in-time product and service knowledge to customers	<ul style="list-style-type: none"> • Reduce costs of providing Tier 0 eService • Heighten customer satisfaction • Improved customer retention and upsell
Customer Education Center	Online university-style centers for teaching customers complex product and service knowledge; Example: conveying investment concepts and market knowledge to brokerage customers	<ul style="list-style-type: none"> • Build good will, brand recognition, and customer loyalty • Potentially, create new source of revenue
Online Certification Center	For complex product support knowledge, provide online certification programs for channel partners	<ul style="list-style-type: none"> • Help externalize product market support costs • Build mind share and loyalty in marketing channels • Potentially, create new source of revenue

Even in their current set of release generations, the existing ecosystem partner products are capable of providing most, if not all the e-learning functionality suggested by these emerging wave solutions. The Saba LMS can, for example, provide the kinds of learner tracking and content-delivery services that would be required of an online certification center. It can also provide the commerce engine functions needed to turn any e-learning solution into a revenue-generating opportunity. gForce has many of the repository-management features needed to offer performance support features as part of a company’s e-service functionality, while Centra provides a robust option for delivering content to learners under any three of the solution scenarios presented in Table 1.

Summary and Conclusion

E-Learning is poised for substantial growth in the near term. The convergence of new technologies, particularly the advent of the Web and the growth of corporate learning management systems, coupled with new approaches to blended learning solutions have opened new vistas of opportunity for e-learning. However, barriers still pose threats to the overall value potential that e-learning can offer.

Ironically, the principal threat comes from the very organizations that could benefit most from e-learning. The challenge on the demand side is for these companies to:

- Find the appropriate sponsors and executive leaders that are committed to workforce competencies
- Design the appropriate governance models to ensure success and fund initiatives
- Understand the organizational competencies needed to successfully implement and prioritize e-learning
- Ensure the network infrastructure required is viewed as an enabler (not barriers)

Companies must take a holistic approach to creating their e-learning strategy. If they fail to view their initiatives as a portfolio of projects, rather than a set of point-solutions, they

will not recognize the significant efficiencies, topline benefits, and productivity gains that e-learning can deliver.

The eLearning Ecosystem provides the necessary bridge to avoid these pitfalls. The integrated nature of the respective offerings across the e-learning spectrum gives an adopter company the necessary tools to launch a successful e-learning strategy in a succinct and cost-effective fashion. The real value the ecosystem offers to companies is that they no longer need to weed through the fragmented e-learning market to find vendors with point solutions that integrate together. Rather, the ecosystem members collectively bring a holistic approach with integrated applications that offer a proven solution in an otherwise youthful market.

At any stage of adoption, the ecosystem approach arms companies with tools and techniques to outpace competitors through measurable results and proven economic advantages.

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