

E-Learning to Create Knowledge and Business

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With the widespread use of the Internet, IT businesses and central government agencies in the United States have been serving as the driving force behind the trend toward developing e-learning as an everyday activity. These approaches towards e-learning are typically characterized by educational outreach efforts and community formation. In Japan as well, businesses are starting to use e-learning not only as a method for independent study, but also as an effective tool for business reform.

Many businesses that have successfully introduced e-learning have adopted a top-down approach, which means that it is not merely used to replace classroom training or reduce costs. The key to success in the future will be the development of environments that integrate classroom training, e-learning, community building and other elements to develop new learning styles, provide frameworks for human resource development, and establish employee knowledge cycles that are in tune with management strategies.

The NRI (Nomura Research Institute, Ltd.) group has long advocated the “enterprise learning platform” (ELP) as a next-generation learning environment that goes beyond simple e-learning applications. ELP is not merely an in-house system. We can make full use of it as a business solution to invigorate collaboration with partners and customers as a means of increasing corporate value even more.

I Accelerating the Shift to E-Learning in the Business Sector

Although the word “e-learning” already appears in general use, its meaning is interpreted in various ways. Below I will outline the historical background and current status of e-learning.

1 History and Characteristics of E-Learning

The term e-learning has been around since 1998, when the buzzword “e-business” first came into general use. Another term that expresses a similar concept is web-based training (WBT), which refers to the sort of environment that supports learning by means of browsers connected to the Internet or intranets.

Even before the emergence of the Internet, terms such as computer-aided instruction (CAI) and computer-based training (CBT) had gained wide currency. As early as the 1970s, just shortly after the debut of personal computers, there already was interest in their potential use as a learning tool. However, CAI and CBT did not come into general use because computers were not widespread enough to provide one PC or on-line terminal for each trainee. The educational activities during this period—which largely was characterized by a stand-alone environment—can be called “first-generation e-learning.”

The widespread use of the Internet revolutionized business and simultaneously triggered a transformation in learning styles. Now second-generation e-learning has arrived. Today e-learning is increasingly seen not just in terms of CAI, CBT and WBT, but also rather as a hybrid concept that also encompasses the use of CD-ROM educational resources, as well as mobile terminals such as mobile phones and personal digital assistants (PDA).

The key features of e-learning include the following.

- High-quality educational materials can be provided, regardless of the quality of the instructor.
- Educational materials are made available in accordance with the level and progress of the learner.
- Learning opportunities can be provided to large numbers of learners simultaneously.
- People can learn anytime, anywhere and at their own pace.
- Student progress and performance can be monitored in real time.
- Unlike correspondence courses, e-learning eliminates the work of distributing printed materials, CDs, videos and other materials, and awaiting learner responses. Educational resources can be updated in real time.

- While TV broadcasting involves one-way communications, most e-learning systems can support interactive communications.
- The time and costs involved in bringing learners together for classroom training can be eliminated.

E-learning thus offers a learning environment that would not be feasible without the access and support provided by information technology (IT) systems, and is evolving steadily in step with the progress of IT.

2 Components of E-Learning

E-learning is comprised of three elements, each of which is described below and compared with conventional learning methods.

(1) Content delivery methods

Content consists of learning and educational resources and learning activities. Conventional learning and educational resources are either texts or tests, or combinations thereof. As is the case with e-learning content, texts may be accompanied by audio or video materials.

However, e-learning has other advantages. For example, it allows content to be adjusted and supplied according to the level or progress of the individual learner. It also supports simulations as a way of testing skills in performing some activities that would be difficult to do in real life, such as the handling of hazardous materials.

Content for second-generation e-learning is written in Hyper Text Markup Language (HTML) or eXtensible Markup Language (XML), which can be viewed with browser programs. Audio and video content is delivered as batches of streaming data (i.e., a large amount of data that is distributed in small pieces).

Shown below are the three methods that were not available in first-generation e-learning:

① Live broadcasting

This method is analogous to live television broadcasting. However, while television broadcasting is a one-way process, e-learning can be a two-way system that allows participants to take tests, ask questions, or respond to questionnaires. This capability is frequently used for seminars and other events.

② Video on demand (VOD)

This technology is being introduced via cable television (CATV) systems. It allows large numbers of learners to access video content whenever they wish, rather than at set times. As with live broadcasting, it can function as a two-way system.

③ Interactive communications

Interactive e-learning systems take advantage of the two-way capabilities of the technology. There are two approaches: “distance education” and “community.”

With the remote instruction approach, the instructor and learners in separate locations interact by using shared files like a blackboard. The instructor can also interact with the learners through text messaging systems, or via audio and video communications. With the community approach, the instructor becomes the focal point of a virtual class, and it is also possible to hold discussions with experts on specific themes. In addition, learners can collaborate among themselves. Sessions can be recorded, allowing participants to share and reuse their achievements. While ready-made content is available on the market, businesses and schools can also create their own custom-made content.

(2) Authoring tools

Authoring tools are software products with editing functions to create content. In recent years system vendors have introduced a variety of authoring tools on a commercial basis to facilitate the creation of custom-made content. There are three basic types of software.

- Software to convert documents, images and charts created on word processors, spreadsheets and presentation software into e-learning content.
- Software that allows people without programming skills to create advanced content, such as simulations.
- Software designed to synchronize audio and video materials with presentation content.

Apart from the actual creation of content, e-learning authoring tools can also be used to incorporate learning management functions that allow the progress and performance of the learner to be monitored.

(3) Learning management systems

Ever since the CAI era, the most important component of e-learning systems has been the learning management system (LMS). This system allows learners, managers and operators to check and assess individual progress and performance.

Even with conventional classroom instruction or correspondence courses, a learner's progress and performance are assessed. However, considerable improvements are needed to create systems that support fine-tuned instruction tailored to individual needs. The advantages of e-learning from this perspective are the ability to provide instruction in real time, and the ability to give training to large numbers of people simultaneously.

More recently it has become necessary to develop management methods for blended learning systems, which combine e-learning with classroom training. There are also situations in which the same content needs to be managed differently according to the purpose of learning. (For example, if the same program is used both for training of employees at different levels and specialist technical training, the completion requirements and charges will be managed differently in each case.) For this reason, learning

content management systems (LCMS) are being developed independently of learning management systems (LMS).

3 Reasons for the Introduction of E-Learning

The increasing use of e-learning in business may be attributable to a number of factors.

- Companies want to improve their corporate value and enhance their competitiveness by recruiting, training and retaining talented staff.
- Workers want to enhance their employability and discover learning opportunities under the increasingly diversified working circumstances.

Since both workers and businesses are focused on education and learning, businesses will increasingly seek to transform themselves into "learning organizations." However, efforts to expand learning opportunities have been inhibited by the following problems.

- Classroom training often causes time conflicts with other activities.
- There is a growing amount of training that all employees must undergo, such as compliance training.
- As businesses decentralize their operations and become more international, it has become increasingly difficult to bring employees together at the same time.

On the other hand, the widespread proliferation of information technologies has enabled each and every worker to have access to the Internet or an intranet with an individual PC. As a result, the barriers are getting lower.

4 Rapidly Expanding E-Learning Market

There is now keen interest in business opportunities in the area of e-learning. Indicative of that interest are the many "e-learning" exhibitions and seminars that have been held in the United States, the United Kingdom and Japan since the year 2000.

According to statistical projections by NRI the e-learning market in Japan will increase 2.4 times over the next three years (Figure 1). As shown in Figure 2, the U.S. market is expected to increase 6.4 times over the same period. This growth of interest in e-learning at a time of gloom in much of the e-business world reflects the strong expectations that e-learning will be a new source of business opportunities in the IT sector.

The firms that are moving into the e-learning market can be broadly divided into content providers and platform vendors. In terms of historical trends, content providers have hitherto offered group education and correspondence courses. They have emerged as e-learning content providers on the strength of their knowledge as producers of educational resources and instruction methods.

Figure 1. Projected Scale of the E-Learning Market in Japan

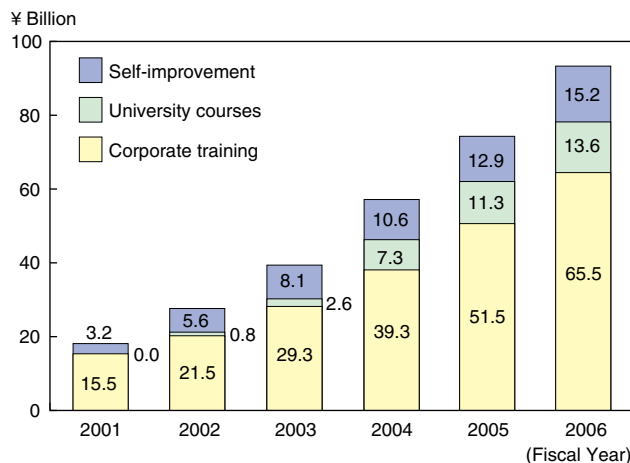
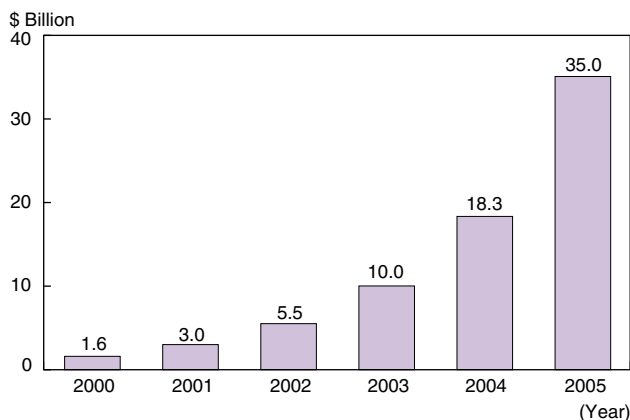


Figure 2. Projected Scale of the E-Learning Market in the United States



Source: IDC (USA) & Yano Research Institute (Japan).

IT businesses have used IT in their internal education systems. Moreover, faced with the need to create new business formats, they have developed their own learning management systems and used that knowledge as the basis to start business as e-learning platform vendors. However, while venture companies were the first to develop the market in the United States, the major IT vendors have been in the market from the outset in the case of Japan.

With the spread of e-learning, there are now situations in which content produced by one company will not run on an LMS created by another. Since 1997 experts in several countries have been working assiduously to overcome this problem under the leadership of the Advanced Distributed Learning Initiative (ADL), a standardization organization based in the United States. These efforts have led to the development of the Shareable Content Object Reference Model Initiative (SCORM), which is a content standardization tool for XML. An updated version (SCORM 1.2) has been released, and many vendors are now able to supply SCORM-compliant content and systems. This is expected to lead to a rapid increase in the availability and use of ready-made content.

II Leading-Edge Case Studies in the United States and Japan

The previous section outlined the evolution of e-learning up to the emergence of second-generation systems. In this section I will examine the types of changes that are likely to occur with the advent of third-generation technology. The analysis will be based on leading-edge case studies in the United States and Japan, as well as the NRI group's own experience in Japan.

1 Leading-Edge Case Study: Kendle International Inc. (United States)

In April 2002, *e-Learning Magazine* issued the e-Learning Success award to Kendle International Inc., which is the world's leading private-sector research organization in the medical field. With 1,800 employees, its main activities include the marketing of new pharmaceuticals, surveys of clinical trials, and monitoring of medical equipment. In 1997 it became one of the first companies to establish its own academic institution, Kendle College, for its employees. With instruction based mainly on classroom training, however, there was a limit to the extent to which it could provide the company's employees in 40 countries with accurate, advanced education on such topics as the medical effects of new drugs on an on-going basis.

The president of the company then decided to introduce e-learning. In 2000 an outside e-learning expert was appointed as project manager, and just over a year later an e-learning site called "eKendle College" was established. Instructors based in the United States actively provide 112 courses and distance learning programs to employees throughout Europe and North America. Some 200 to 300 people also participate in job-related research and reporting activities in this e-learning environment.

Face-to-face video conversations are limited to the start of lectures and conferences in an attempt to prevent delays stemming from bandwidth problems or the distances involved, with the speakers relying mainly on audio or text messaging afterwards. Even so, there might be a time lag of around four seconds between the company's headquarters in Cincinnati, Ohio and the West Coast. Participants in Europe experience 20-second delays with audio presentations. Another operational problem relates to time zones. Lectures are scheduled for early morning in the United States, which is night-time in Europe. However, the advantages are considered to outweigh the problems. Employees in Japan and Australia are unable to participate in the distance learning programs because of time zone differences, but they are able to study using video recordings of the lectures.

The decision to introduce full-scale e-learning has brought a number of benefits. The latest technical information can be shared quickly, and challenging new business opportunities have also emerged. In addition, it has been possible to offer e-learning to customers as a new service. There are also cost advantages. Classroom training expenses have been halved, and training-related travel expenses have been cut by 75 percent. The company attributes the success of the project to the fact that it was initiated at the top-management level, and to the drive of the project manager.

Kendle has set itself the extremely challenging goal of gaining an advantage over its competitors by evolving into an e-learning organization. In so doing, the company has made a number of commitments, one of which includes the eventual elimination of all classroom training.

2 Leading-Edge Case Study: U.S. Department of Health and Human Services

The “e-Japan” concept in Japan was preceded in 1998 by the adoption of an electronic government concept under the Clinton administration in the United States. Central government agencies are putting as much effort into e-learning as is the private business sector. This case study focuses on the Department of Health and Human Services, which is regarded as the most advanced government department in this area.

The Department of Health and Human Services consists of 12 service agencies with a total of 65,000 employees throughout the United States. It is the biggest government department other than the military. After a two-year pilot program, it began full-scale operations of e-learning systems in 2001. The department’s aim is to raise the educational standard of its employees by providing appropriate and up-to-the-minute instruction about laws and regulations.

Currently the department’s e-learning site provides access not only to content produced in-house, but also related to around 3,000 commercial issues dealing with such topics as business skills, human skills, and IT skills. There are also numerous general educational programs that do not relate directly to work activities, as well as courses that can be used to earn university credits. Some of the programs are also open to the general public.

One feature of the department’s site is its inclusion of a wide range of knowledge-sharing content, including messages from the Secretary of Health and Human Services, department news, and medical news. The department has also formed topic-based communities. For example, it operates a site where department staff, physicians and other experts can engage in discussions and share information about anthrax, among others.

Because of the telecommunications environment in the United States, the department has adopted a nar-

row-band approach on the assumption that people will access its site using slow networks, such as the telephone system. For this reason, it has been cautious about the inclusion of video information. Each of the 12 agencies has developed its own backbone system, and these systems are not integrated. However, the department has successfully introduced integrated management of e-learning.

The department believes that e-learning has lowered organizational barriers, and that the more people use it, the more benefit they can gain through their work activities. It has also identified a secondary benefit. By creating an image of itself as an innovative agency with a website that provides leading-edge e-learning, it has enhanced its ability to recruit top-notch students.

A number of factors have contributed to the department’s success. First, the department sought outside partners to drive the project. It also utilized third-party consulting services at the initial stage. Second, education and systems personnel from each of the 12 agencies were included in the project from the outset, creating a department-wide climate of support. Third, e-learning leaders were appointed to run systems in each department.

The United States is generally regarded as a society in which the private business sector dominates. However, research by the author and his associates indicates that the department has clearly been more successful than a certain global corporation with 100,000 employees.

3 Initiatives by the NRI Group

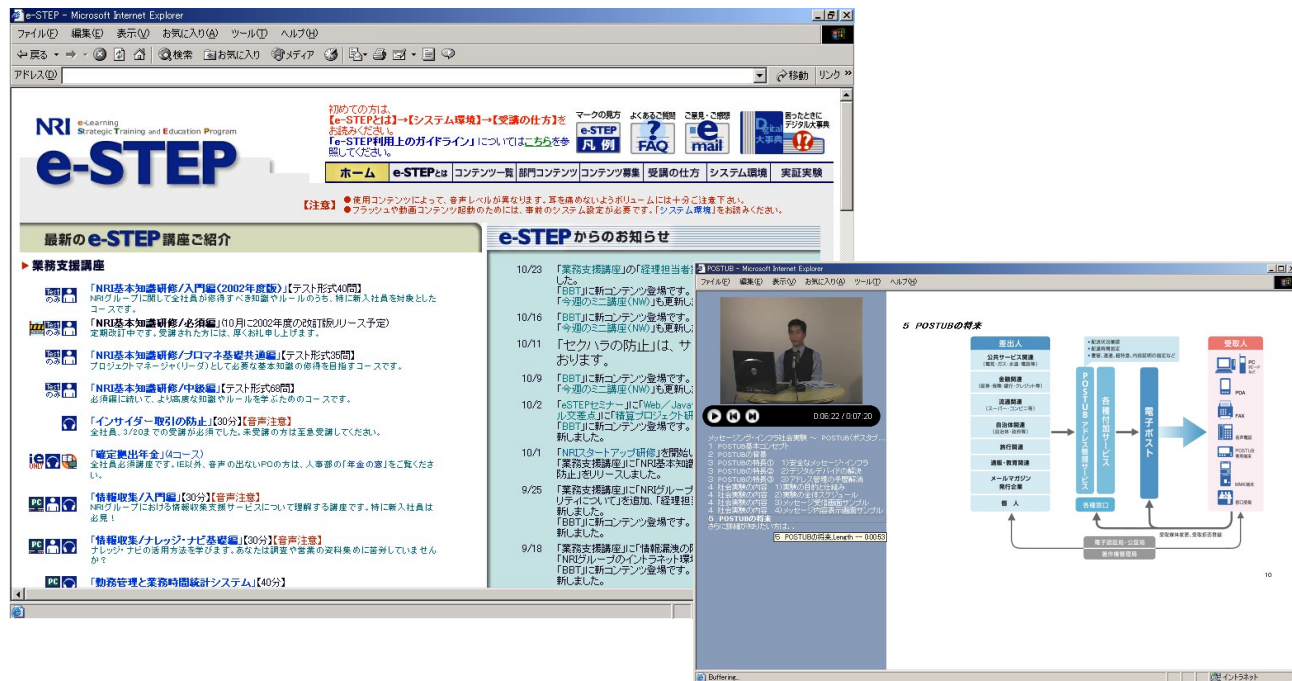
There are few published examples of e-learning successes in Japan. Noteworthy cases include Toyota Motors Corp., the Bank of Tokyo-Mitsubishi Ltd., Autobacs Seven Co., Ltd. and McDonald’s Japan. In this section we will focus on the unique features of e-learning initiatives by the NRI group.

NRI launched a group-wide e-learning project in July 2001. In December 2001 it began to operate “e-Step” (e-Learning Strategic Training & Education Program), an e-learning site for NRI group employees (Figure 3).

Starting back in 1997, the NRI group had produced and sold an LMS called “NetTutor” and 150 ready-made content titles. NRI used knowledge based on this experience to verify its approach to next-generation e-learning in readiness for the advent of the ubiquitous network era.

Now used by around 5,000 people, e-Step has become one of the major e-learning sites in Japan. There are over 300 content titles, and the site is updated regularly with at least four new titles added each Wednesday. Fifty of the titles are NetTutor products, including lectures for information processing technicians preparing for exams. Almost all of the other titles

Figure 3. Example of Top Page Content on E-Step Site



Note: e-Step = e-Learning Strategic Training & Education Program.

Table 1. E-Step Content

Course Content	Details
Operational Support Courses	Courses designed to educate employees about company policy and operational procedures.
Daily Live Programs	Live coverage of seminars and events.
Weekly Mini-Course	A series of courses lasting a few minutes each (updated weekly).
Monthly VOD	TV programs selected for redistribution (10 programs, updated monthly).
One-Point Lessons	Concise 30-minute lessons on current information.
E-Step Seminars	Recorded in-house and outside seminars, accompanied by seminar materials.
E-Learning Courses	Self-study courses on IT, business, etc., based on e-learning materials.

Knowledge Content	Details
Management Messages	Messages from the management (other documents posted if required).
NRI Scramble Crossroads	Video programs with in-house information, including management information and event information.
NRI News Analysis	Analyses of news releases by PR staff (accompanied by related information).
NRI Product Information	Product information distributed outside of the company (includes voice commentary).
Departmental Content	Operational support information from various organizations, including departments, corporate headquarters and project groups.
Knowledge Links	A collection of links to NRI knowledge sites.
Refresh Corner	Relaxation videos contributed by employees.

Note: IT = information technology; VOD = video on demand.

are in-house products, and the majority include video and audio material.

NRI is also developing the necessary infrastructure. By the end of 2002 it will complete an upgrade of the local area network (LAN) in its own headquarters to 100-Mbps circuits. Headsets are issued to all employ-

ees, creating an environment in which they can study at their own desks whenever they wish.

All types of content are covered, including teaching materials, tests, simulations, VOD, live programs, and interactive programs. As shown in Table 1, program categories are not limited to narrowly defined training

materials supplied by the Human Resource Development Department. There is also a significant amount of material distributed by corporate headquarters as well as individual departments and project groups. It is important to note that the bulk of content to be shared is knowledge that is highly relevant to operations. If required, security measures can be implemented to prevent people in other departments from accessing department-specific content.

Today live broadcasts are routinely used for in-house seminars. It is also routine to provide access to quality television programs that are relevant to business through VOD under secondary distribution contracts. Four programs are available at all times at NRI. With both live broadcasts and VOD, users are able to view additional information through their browsers. The interactive environment also supports e-mail and questionnaire survey functions.

New recruit training is based on virtual classes organized for each lecture and class. For one year, the instructors assigned to each new employee work with lecturers and academic advisors to operate knowledge communities through collaboration based on file sharing and threaded discussions (bulletin board dialogues recorded in hierarchical form).

Records show that e-Step is accessed by 90 percent of directors and employees, and that e-learning accounts for around 15 percent of total training (by time spent on instruction and training). The system operates around the clock, and participants can even receive training from offices overseas. Employees unable to access the system are basically those who are too busy with work, and those who have no connection to the in-house intranet, such as people on temporary assignment to other companies.

Participation in required training, such as compliance training and courses relating to defined contribution pensions, is reported to employee supervisors to allow appropriate guidance and follow-up measures. Annual savings on this type of required training for all employees are estimated at ¥500 million.

The introduction of this technology has brought the following benefits to the NRI group.

- Classroom training is also used only if it is necessary in those programs.
- High-quality content can be provided fast and interactively to large numbers of employees.
- In the past, knowledge about who within the company specialized in which areas was treated as “tacit knowledge” (information known only to a few). Extensive use of video resources is turning this information into “visible knowledge” that is shared throughout the company. (“Visible knowledge” is a concept proposed by NRI. It refers to a process whereby “tacit knowledge” is transformed into visible forms so that it can be shared, even though it has not been formalized.)

- Individual departments and project teams can easily initiate the distribution of high-impact visual information that can be linked directly to operations and business.

There are plans to expand the service functions of e-Step through enhancements in the following areas. These plans will be implemented progressively during fiscal 2002.

- Provision of a learning support environment based on closer, one-on-one interaction. (including a personalized learning menu that caters to the attributes and abilities of each individual).
- Provision of an environment that can be used at home or via mobile devices.
- Linkage with in-house information portal sites.

III Requirements for Successful E-Learning

In the United States, all of the Fortune 500 companies (the world’s 500 largest corporations, as listed by Fortune magazine) appear to have introduced e-learning. The United States is estimated to be more than two years ahead of Japan in this regard. For example, over 50 percent of companies have introduced distance learning systems, in part because of the vast distances that are involved in a huge country such as the United States. But, there are also cases in which e-learning has not been implemented successfully in U.S. companies. The following analysis highlights the factors that lead to success or failure, and the criteria that must be taken into account when assessing outcomes.

1 E-Learning Success Factors

(1) Involvement of top management

Just as the involvement of the chief information officer (CIO) is crucial to the successful introduction of information systems, the successful implementation of e-learning also requires the involvement of top management. The focus of human resource development is to develop human capital that matches the company’s philosophy and management strategies. It would be unthinkable to train people in ways that were not aligned with corporate strategies.

Top management should therefore set policies for the introduction of e-learning. Those policies should include clearly defined goals, and specific ways in which e-learning can contribute to core business activities, and the types of human capital needed. Failure is likely if the only objective is to reduce training costs.

(2) Clarification of aims and benefits

It is important to have a clearly defined strategy based on cases studies for the introduction of e-learning, as

well as specific methods for post-introduction assessment. Knowledge sharing benefits may be difficult to measure quantitatively, but it is possible to confirm the benefits through other indicators, such as the number of inquiries to experts, and the use of threaded FAQ discussions (posted lists of questions and answers). The goals should not simply be to reduce the frequency of classroom training, or to replace conventional classroom training with e-learning.

(3) The importance of competency management

Some companies and experts refer to competency management as human capital management or skill management. The first step is to clarify the types of knowledge and skill elements (competencies) needed at each level and in each of the company's operations. With e-learning, it is necessary to measure the gap between the learner's present knowledge and skills and the competencies required, and to provide support mechanisms that allow that gap to be filled through training and work.

(4) Establishing a learning cycle

Learning occurs through a cycle of planning, implementation and assessment based on competency management. After assessment, a new cycle begins at the next level. Because e-learning involves the substantial use of self-learning content, it is even more important to make this cyclical mechanism available for learners, managers and operators.

Oftentimes, learners mistakenly assume that they can improve their skills simply by viewing the content. And some course operators take the complacent view that they have introduced e-learning because they have put content on their servers.

(5) The importance of instructional design

Even with conventional courses, the preparation of quality lectures and teaching materials requires sophisticated and specialist knowledge. Similarly, expert knowledge is required in order to decide whether or not a particular course should be converted to e-learning, and, if so, what types of content should be produced. In the United States, professionals in this field are given the authority to work literally as "designers," and they have established a role for themselves as "instructional designers." A newly developed system that is not properly designed is likely to fail, so the design process is crucial when developing e-learning content.

(6) Establishing an operational organization

Once e-learning has been introduced, maintenance and management tasks will require a surprising amount of effort. Unlike classroom training, e-learning requires continuous site operations. As in the world of B2C (business to consumer) and B2B (business to business) e-commerce, sites will eventually lapse into disuse

unless they remain constantly fresh and attractive to users. It is therefore necessary to establish a robust operating system and an operating entity with strong planning skills and content production capabilities.

(7) Ensuring the quality of video and audio resources

People commonly record video and audio material using home video cameras. Just as some people are better than others at producing home videos, it is necessary to maintain a certain standard of quality in the material used for e-learning.

Learners will not be satisfied with video materials produced by people who do not understand the use of lighting and tripods, or audio materials created by people who cannot record quality sound directly through microphones. Appropriate technical skills are required to record noise-free audio material, especially when it will be heard through headphones. The equipment and software required to do live broadcasts or to edit digital video data are not yet readily available on the market, so experience is crucial in this area.

(8) Establishing distribution systems

Broadband infrastructure is needed to create an environment in which large numbers of employees can view and listen to content, including audio and video materials, at the same time. This infrastructure must be based on advanced communications technology, including multicasting and VOD systems. If materials are to be accessible from employee homes or mobile terminals, it will also be necessary to implement other types of technology, such as content license and copyright management systems.

Items (1) through (5) apply to both group learning and e-learning, while items (6) through (8) are specific to e-learning. There is no royal road to human resource development, and it is necessary to meet these requirements one at a time.

2 Assessment Criteria for E-Learning

Assessing the effectiveness of e-learning will typically involve three categories of direct users: learners (employees/learners), managers (supervisors/academic advisors), and operators (instructors, teachers, organizers). An e-learning initiative cannot be regarded as successful unless it receives high marks from all three parties.

- Learners need quality content that matches their objectives, a learning environment in which they will be motivated and able to continue learning on their own, and systems that are easy to use.
- Managers must be able to provide appropriate guidance according to each learner's progress and achievements. They also need an environment in which the knowledge and skills of individual learners

can be shared at the organizational level and applied to business activities.

- Operators need an environment in which quality content can be supplied quickly, and in which they can readily carry out their learning management work flow activities, including course planning, design and development, recruitment of students, implementation of courses, post-course assessment, and billing.

In all cases, preparations for the introduction of new systems should include setting up an assessment framework that will allow the benefits and results to be measured clearly on the basis of return on investment (ROI), for example. In the United States, the Department of Health and Human Services uses an ROI approach for assessment purposes. The parameters adopted are based on assumptions similar to those that apply in the business sector.

IV E-Learning in the Ubiquitous Network Era

In conclusion, I will examine the future directions for e-learning from three perspectives. This will be followed by some recommendations concerning the development of new environments for third-generation e-learning and the use of e-learning.

1 Future Directions

(1) RealBlend learning integration

As noted earlier in this paper, people are already using the term “blended learning.” In many discussions, however, this term refers simply to learning environments that support combinations of classroom training and e-learning.

In the future, efforts to design optimal learning environments will go beyond mere combinations. This will make it possible to provide new types of integrated learning environments unlike anything that has existed in the past. For example, e-learning courses may be introduced as preparations before classroom training, and mentoring may be employed while courses are in progress. And a follow-up after the completion of a course could take the form of discussions in knowledge communities. The NRI group calls this type of environment “RealBlend Learning Integration,” which it defines as a truly optimized integrated approach to learning, and plans to establish the know-how for e-learning through continuous experimental innovations and feedback from ongoing enhancements of the aforementioned e-Step site.

(2) Establishing a human capital management cycle

E-learning is one method for facilitating self-learning. From a human capital management perspective, how-

ever, mechanisms are needed to support an optimized development cycle tailored to each individual employee. Otherwise employees would develop knowledge and skills in uncoordinated directions. Many companies manage their personnel under human resource management (HRM) systems, but few have systems capable of human capital management (HCM).

In the future companies will be required to establish cycles through which their employees can grow by providing environments in which workers will be offered career development programs tailored to their specific abilities and wishes. These programs will enable employees to assess their own skill gaps and obtain guidance about optimal one-on-one learning courses, followed by further assessments after a certain period of time.

(3) Establishing a knowledge cycle

Even if individual employees are able to improve their knowledge and skills, the overall potential of the organization will not be improved unless there are mechanisms that allow the acquired knowledge and skills to be fed back into the organization. During the knowledge management boom that began a few years ago, there was considerable debate about ways to convert tacit knowledge, which accounts for 70 percent of the knowledge in corporate organizations, into formalized knowledge. In practice, however, this formalization process has become a bottleneck. Moreover, some companies have introduced knowledge management systems but do not have the know-how to make use of them in their actual business activities.

As knowledge management concepts are integrated into e-learning environments, it will, for example, become possible to seek instructors or content within or outside of the enterprise as sources of knowledge. By using video, it will be possible to use tacit knowledge as visible knowledge, even if has not been formalized. Moreover, by establishing communities with instructors and experts in each content and course category, it will be comparatively easy to share and reuse knowledge within organizations. The goal should therefore be to establish a knowledge cycle that allows the organization to grow through collaboration among individuals within and outside of the organization.

2 The ELP Concept

Developments in these directions will lead to the establishment of learning environments in which each learner will connect to a personal intranet link and access a learning site, from which a personalized page will be displayed. It might include information about courses recommended by the company or the department, a guide to that day’s live video programs, a management policy briefing by the department head, notices about the results of course applications, charts

showing the learner's performance and other records, and information about responses from communities to which the learner belongs.

Sophisticated, wide-ranging systems will be needed. The capabilities required will include LMS functionality based on the integration of e-learning, group learning and community building, as well as LCMS functionality to support the management of content, including learning materials, instructors (subject matter experts). Other system requirements are features to manage community discussions, the ability to extract and accumulate in-house and outside knowledge, content license and copyright management functions, organizational and community security functions, HCM functions, and functions to coordinate human resource management (HRM) information and billing information with enterprise resource planning (ERP). Systems will also need to encompass enterprise information portal (EIP) functions.

The NRI group has developed a concept that integrates these functions into the next-generation learning environment that goes beyond existing e-learning sup-

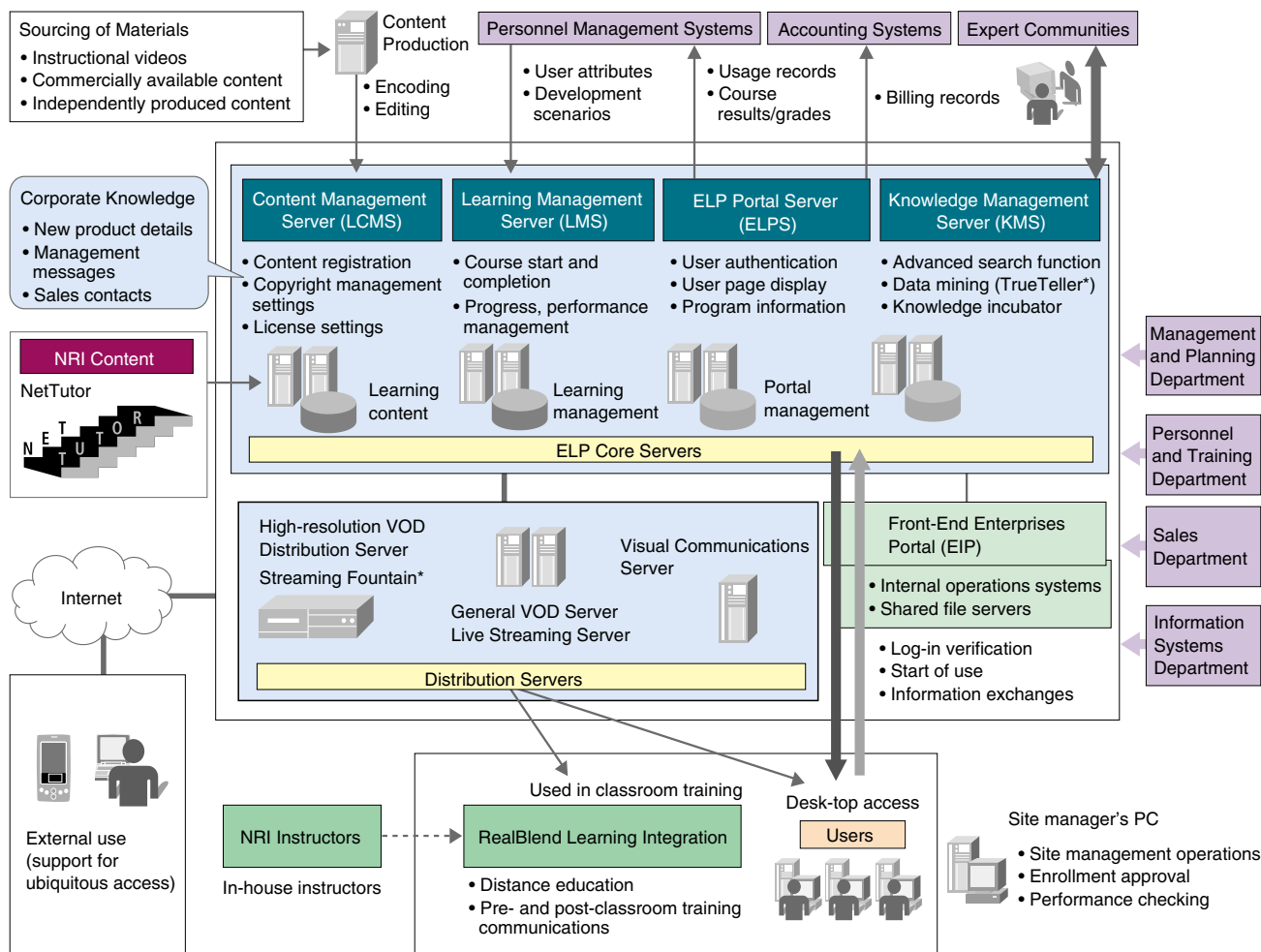
port systems to make a learning organization possible. Known as the NRI Enterprise Learning Platform (NRI-ELP), this concept is illustrated in Figure 4.

3 Creating Business Through E-Learning

The use of ELP is not limited to the business-to-employee (B2E) context. It can also be applied to existing supply chain management (SCM) systems, which are used in a business-to-business (B2B) context as a framework for collaboration among businesses. By introducing ELP at this level, it will be possible to improve recognition and immediacy by using video content delivery in place of conventional new product information distributed on paper or videotapes. In addition, effective sales methods can be disseminated to suppliers and customers through e-learning.

Given the similarities that exist between HRM and customer relationship management (CRM), it will also be possible to use ELP to provide information about products that best matches the attributes of suppliers and customers, or to provide detailed guidance to

Figure 4. The NRI-ELP Concept



Notes: (1) Asterisks denote English product names; (2) EIP = enterprise information portal; ELP = enterprise learning platform; ELPS = ELP system; KMS = knowledge management system; LCMS = learning content management system; LMS = learning management system.

individual sales personnel. Product-based communities would allow the sharing of current information and new business leads among development staff, sales personnel, users and others. The transition to new systems could be facilitated by using ELP to provide suppliers and customers with simulation content about new system terminals.

In a B2C context, e-learning versions of product manuals would allow consumers to gain a more accurate and visual understanding by simulating various operations. By providing e-learning sites for consumers,

enterprises would be able to enhance their brand images more effectively than with conventional web sites.

Enterprises should seek to improve their corporate value by making the most of ELP solutions to create knowledge and business opportunities.

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