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LEARNING
WITHOUT
LIMITS

vol. 2

—
*Leveraging
the Power of
Electronic
Learning*
—

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Ellen D. Wagner, Ph.D.

ARE YOU
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NO QUESTION ABOUT IT — technology has transformed the way that business is conducted in today's marketplace. Interest in electronic commerce is at an all-time high. Electronic messaging, document transfer and transactional processing are increasingly commonplace, even in small companies. Virtual warehousing has completely altered inventory management practices. Marketing activities are a mainstay of corporate web applications. It is more common for companies to have an Intranet than not. Clearly, knowing how to effectively deploy technology in the workplace has become a mission-critical business skill.

Interest in using a company's information technology infrastructure for training and performance support applications represents a natural evolution in business thinking. Building technology infrastructure in organizations represents a significant investment. It is in a company's best interest to find as many ways as possible to leverage this investment through broadened use. The need to work smarter and faster, access and use information when and where it is needed all point to deploying information technology to improving learning and performance. Supporting the training and professional development needs of an organization's workforce via technology has become an important strategy for increasing and maintaining a company's competitive advantage.

Electronic learning (also known as *online learning* or *distributed learning*) is a term used to refer to the wide range of technology applications that provide learners with the means to increase their knowledge and improve their skills when and where they need support.

Generally speaking, electronic learning features three categories of technology applications:

- Self-paced (multi)media such as CD-ROM, computer-based training (CBT) and interactive videodisc (IVD)
- Interactive, real-time and asynchronous (multi)media such as computer-mediated conferencing, interactive television (ITV), and video-teleconferencing.
- Distributed (multi)media such as the World Wide Web and the Internet.

To better understand why electronic learning has captured the interest and attention of corporate decision-makers, it is worth taking a look at trends in two distinct arenas that have strongly influenced electronic learning's growth and development. On one hand, the ubiquitous availability of information technologies has made electronic learning a viable alternative for even the smallest organizations. A brief review of recent hardware, software and network developments will help conceptualize infrastructure-related issues. At the same time, increasingly complex, competitive workplace support needs are resulting in increased demands for better access to information, learning and performance support resources, when and where these resources are needed most. Therefore, a brief review of issues addressing workplace learning and performance support needs will provide a look at the business side of electronic learning's appeal.

THE POWER AND INFLUENCE OF INFORMATION TECHNOLOGIES

Clearly, one of the most obvious attributes of electronic learning is its dependence upon technology. Computers, personal digital assistants, wireless and cellular pagers and telephones have become smaller, cheaper and more readily available. Transmission systems can choose from among a number of carrier options. This means that the infrastructure needed to distribute electronic learning resources has reached a sufficient number of (potential) learners to create a market for programs and services.

Some of the specific developments leading to the widespread availability of technology include:

- *Accelerated desktop computer processing speed.* The processing power of today's desktop computers rivals that of large main-frame computers from only a decade ago. These increases in desktop-accessible speed and power greatly increase the capability of individuals to generate creative computing solutions to meet their own needs, on their own terms. This means that powerful, customizable electronic performance improvement

solutions are within reach for organizations of all sizes, of all types.

- *Platform-independent data transmission protocols.* In the not-too-distant past, the selection of an operating system standard defined how and with whom one could exchange data files. Given the tremendous developments in networking protocols, it is now possible for UNIX users to share data with WIN95 users, who can, in turn, share that information with Macintosh OS users, who can, in their turn, share information with OS/2 users. This means that concerns of networking can be less focused on the tools of communications networking and more on the intent of interpersonal networking.
- *Improved browser technology, and features such as Java-enabled client-server interactivity.* Readily accessible “new media” such as online multimedia and hypermedia offer computer users of all levels of proficiency gateways to an array of full-motion, fully animated, interactive, responsive information resources. Features such as “streaming” audio and video transmit digital bits representing sounds, pictures and motion in real time as a web page loads on a user’s computer, allowing websites to offer “real time” multimedia displays comparable to that available on a CD-ROM (as long as sufficient bandwidth is available for transmission.) There is every indication that in the next few years, online multimedia will be the rule rather than the exception for learning facilitation and professional development. For example, a recent survey using the HotBot search engine shows that the number of Web pages containing streaming media content increased more than 275 percent between September, 1997 and January, 1998. This represents an increase from approximately 100,000 pages containing streaming media functionality to more than 280,000, with the number of pages increasing monthly at logarithmic rates. (Guglielmo, 1998).
- *Content Objects and Knowledge Content Distributors.* A content object is a modular data unit that encapsulates information to describe and present a concept, skill operation, or procedure. Employing a categorization schema called a meta-data structure defines an object’s descriptive attributes (e.g., whether it is text, animation, audio or video information; the size and type of file; the topic being presented in the object, the performance that the object is intended to elicit, and so on). The meta-data structure makes it possible to combine powerful database capabilities with online search and file retrieval capabilities so that specific content objects can be identified, located and retrieved. Known as *Knowledge Content Distributors* or *KCDs*, (Masie, 1998), these content object/metadata tools operate as “wholesalers” of online



and digital learning content from multiple vendors, providing user organizations with the ability to mix and match learning products. In practical terms, this means that users can select and compile the precise content objects that they specify.

- *Improved “backend” database technologies.* Combined with the browser and interactive features noted above, programs employing full-scale database backends make it possible for even small businesses to leverage the power of real-time online transactional processing. They also make it possible to offer adaptive, fully individualized professional development resources that respond to a user’s profiled needs and interests by establishing search and sort protocols that access only the information that is relevant according to that user’s profile.
- *The ubiquitous availability of commercial Internet Service Providers (ISPs).* Many people forget that the “.com” designation for commercial Internet users has only been available since the privatization of the National Science Foundation’s NSF-Net in the mid-1990s. Until that time, most Internet users were those affiliated with government and government-sponsored research organizations, educational institutions and branches of the military. The burgeoning number of commercial Internet Service Providers and the competition among them has affected dramatically the access to service, types of service, costs for service and provision of user support that Internet users have come to expect.
- *Improved access to the bandwidth needed for large file transmission.* Both because of complaints from those who bemoan delays they encounter downloading large graphical files over the “World Wide Wait,” and consumer demands for more bandwidth, service providers are escalating plans for upgrading network and modem capabilities. Digital Subscriber Line (DSL) service, offering transmission speeds up to 30 times faster than what is available over standard (twisted copper pair) voice-grade telephone lines is starting to emerge in selected markets. The promises of transmission speeds in excess of 1000 times the current 28.8 - 56 Kbps modem “standards” are very likely to be available by the turn of the century.

DEMANDS FOR PERFORMANCE IMPROVEMENT IN THE WORKPLACE

While evolving technology has certainly exerted its influence on the emergence of electronic learning, the most important variables influencing the initiation of electronic learning experiences come from a need to bring about individual and/or organizational perfor-

mance improvement in the workplace. Today's economy and business environments operate by new rules shaped by an organization's ability to adapt and respond to change. This, in turn, depends in large part upon that organization's employees' ability to think critically, to problem-solve and to anticipate new possibilities (Carnevale, 1991, Rothwell, 1996). Growing workplace demands for information, instruction and training resources that are available when and where support is needed is tacit acknowledgment of the need for more individualized performance support. Increasingly, learning resources can be accessed online. The presence of a growing online learning and performance support marketplace is shifting the balance of power from providers to consumers. It is easy to understand why there is growing impatience with traditional methods of designing, delivering and managing learning experiences that are increasingly out of touch in a "wired world."

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*Are
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WHY CONVENTIONAL TRAINING IS NO LONGER ENOUGH

There is no question that training plays a significant role in meeting workplace performance support needs. However, while training is certainly an important tool for improving employee knowledge and skills, conventional classroom-based training may be insufficient for the kinds of continuous, individualized performance improvement that are enabled through electronic media. This is due in part because training is usually not proactively developed to meet a company's strategic business needs. Rather, it is implemented to react to a performance deficiency. Electronic learning provides the means of proactively pursuing information and performance support resources when and where those resources are needed.

Training has traditionally been conceptualized and designed as something which is "done to" learners. That is, specific outcomes need to be achieved, so learners are expected to conform to a path dictated by either the designer of the learning experience, the instructor for the learning experience, or both. Typically, training is not designed to be flexible enough to meet an individual's learning needs, and typically it is not available at the time it may be needed by any given individual. Electronic learning provides a means of responding to an individual's self-determined need for improvement wherever there is access to an Internet or a network connection.

For those who want to apply what they just learned, returning to work from the training setting can be disheartening. The crises of the moment often interfere with the best intentions. Goals set after completing a training experience get set aside to deal with the details of day-to-day business operations, and often never are implemented. Self-managed and self-directed learning occurs when training and information resources can be accessed directly from the desk-



top. Technology makes it easier to track down resources needed to make decisions. It can even help locate resources, both online and offline, that are available at times and in formats that meet the individual's needs. With information and training resources being more readily available via technology, electronic learning is facilitated and enabled. Electronic learning tools can offer individualized learning profiling that diagnose skill gaps and prescribe professional development activities to make sure that there is a link between learning events and on-the-job practice. Individuals can monitor their own progress and determine what the next step in their professional development should be.

CHALLENGES AND OPPORTUNITIES

Many compelling arguments can be made to demonstrate that electronic learning brings real value to the organizations that employ technologies for meeting their information, learning and performance support needs. Even so, while corporate training professionals recognize the potential electronic learning represents, there is still some resistance to full-scale, enterprise-wide implementation. A recent (Fall, 1996) survey by Georgia Tech University noted that while 85% of their respondents from Fortune 500 Companies indicated that their companies had either implemented or were in the process of implementing company-wide intranets, 68% noted that web-based training efforts are likely to be implemented 6 months to 18 months in the future. The American Society for Training and Development's 1998 State of the Industry Report noted that training delivered via corporate Intranets was used for only 3% of the respondents' total training efforts. Electronic performance support systems (EPSS) were used in 7% of the training offered by companies participating in the study (Bassi & Van Buren, 1998).

It's important to remember that web-based training and EPSSs are relatively new features on the training and development landscape. Resistance may be a reflection of not knowing how to leverage the unique features that electronic learning offers. It may also be a reflection of inappropriate expectations that have been placed upon those media. For example, some training and professional development professionals (e.g., Cohen, 1997) suggest that electronic learning experiences may simply be a substitute for more conventional training experiences. Others (e.g., Filipczak, 1996) have suggested that training offered via the Web may be more similar to a performance support system than it is to our expectations of training.

What may be needed to "mainstream" electronic learning for corporate training applications is a completely new approach for supporting electronic learning efforts at the enterprise level. Eric Gomberg and Anne Derryberry (Please see their article in this issue

of *Learning Without Limits*) have suggested that *performance improvement environments* may provide the kind of over-arching management structure that enables a full range of electronic learning efforts to flourish in enterprise-wide applications. Such environments can facilitate the integrated utilization of the full range of media enterprises used to support their learning and performance support needs:

- Self-paced media such as CD-ROM and CBT that offer potentially large repositories of content objects.
- Interactive real-time and asynchronous media such as computer-mediated conferencing, ITV and video-teleconferencing that extend the classroom via technology.
- Distributed media, such as Web and virtual communities that are oriented toward meeting the learning needs of individuals on terms that users define for themselves.

Of course, there will be times when electronic learning may simply not meet the specific needs of a given learning or performance improvement task. Getting groups of people together in face-to-face settings may be an essential part of a total learning experience. It is important to balance the things that the various varieties of electronic learning can do very well with the things that can be done even better in person or through other presentation modalities. The focus, after all, should be on learning – not just on the tools through which learning is achieved.

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Eric Gomberg and Anne Derryberry

PERFORMANCE
IMPROVEMENT
ENVIRONMENTS

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PERFORMANCE IMPROVEMENT ENVIRONMENTS

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HESE ARE CERTAINLY interesting times in the burgeoning information age. IT labor shortages have reached alarming levels; the Gartner Group (1997) estimated over 300,000 unfilled positions in 1997. The use of Intranets by major corporations continues to grow; another Gartner Group estimate suggests that by 1998, more than 50% of the largest multinational corporations worldwide will have enterprise-level networks. The price of computing power has dropped to an all-time low. High-powered business computers can now be acquired for under \$1,000. New technologies and applications continue to be released at record rates.

Put these factors together and it becomes apparent that a significant opportunity exists for unprecedented growth in the use of electronic learning and support. For example, Lakewood Publications project a 900% increase in electronic learning implementations by 2001 (see <http://trainingsupersite.com/publications>). The demands from employees for exposure to new skills are growing at a time that businesses are looking for ways to do more with less. The timeframe in which employees are expected to be productive is no longer measured in years, or months, but is more and more being measured in days, or hours. Businesses can no longer afford the interruption to work processes caused by spending day after day in classrooms, rather than producing goods or working with customers.

There are many electronic learning paradigms that are receiving increasing levels of attention in the industry in response to these business trends – Web Based Learning, Performance Support, Distance Learning, Distributed Learning and others. Recently, some new labels

have been introduced (Masie, 1998) that reflect the opportunities that new technologies provide: Knowledge Content Distributor (KCD), Learning Service Provider (LSP), and Assessment Skills Center (ASC). No one method is best for any business or any learner in all situations. Each of these approaches can bring excellent results if used in the right ways. What is needed is an environment that embraces all these diverse approaches so that organizations and individuals alike can take advantage of the best that each of these approaches has to offer. This article discusses such an environment – a *performance improvement environment*.

WHAT IS A PERFORMANCE IMPROVEMENT ENVIRONMENT?

A performance improvement environment (PIE) is a holistic online environment within which individuals can effectively access an organization's information base to meet personal performance support and training needs. With a PIE, organizations can bring together different approaches to learning, support and professional development for optimizing individual performance and organizational productivity. While the focus is on self-directed learning, a PIE need not be tied to any one learning paradigm. The learning can occur via computer-based training, distance learning or other collaborative events, web-based training, new media or other methods.

The advantage of a performance improvement environment lies in its flexibility. This flexibility is derived from a blend of Internet technologies that provides a heterogeneous approach to electronic learning and support that is optimized for the needs of the business community.

There are six major characteristics of an effective PIE. They are:

1. User-centric, user-driven/controlled
2. Performance-focused
3. Content-neutral
4. Learning model/design/style-neutral
5. Intra-/Extra-/Internet delivered
6. Capable of sophisticated monitoring and management

USER-CENTRIC, USER-DRIVEN/CONTROLLED. One of the principles behind a PIE is that it is designed to support the needs of the user, not the needs of the trainers or the training vendors. It supports self-directed learning, whether the requirement is to satisfy a particular need immediately, or to work through a customized learning plan. It provides both rapid access to particular content as well as general browsing of a wide range of subject matter.

An essential part of an information retrieval system, which is a core component of a PIE, is effective mapping between users' needs and the content that can satisfy those needs. The environment only becomes user-centric if it contains mechanisms to continually assess the needs of the user and create automated content mappings to correspond to those needs. The users needs are often role-based or task-based. If we approach the needs of the users at the role or task/job level, a more optimum mapping of their needs will occur. The more granular the mapping of the user needs, the more effective the PIE can be.

We refer to the mapping of these needs to the content that serves them as *information channels*. An information channel is simply a "road map" that originates with the need of the user and ends with the precise content that satisfies it. The more streamlined the information channel, the more rapid the retrieval of the information that solves the problem. Examples of information channels include facilitated or prescribed searches, individual curriculum or learning plans and customized content views.

Users can also control the way information is presented or the kind of information they see by establishing profiles and filters according to personal preferences. By coupling preferences with information requests, a PIE can ensure that the user only sees what he or she wants and needs.

PERFORMANCE-FOCUSED. As the name would suggest, a performance improvement environment is principally concerned with enhancing the performance of its users. A PIE looks at performance in three ways, each of which requires a different perspective and format for the information it elicits:

- *Task-oriented information* – a user who has an immediate need to complete a task but needs assistance in doing so will make a request of the PIE. The PIE will fulfill this request in the form of performance support.
- *Skills (or knowledge)-oriented information* – a user who has a near-term need to acquire skills or knowledge related to the position he or she holds will make a request of the PIE. The PIE will provide targeted training or learning resources.
- *Competency-oriented information* – a user who is trying to bridge a competency gap related to the position he or she holds currently or a position he or she is seeking will make a request of the PIE. The PIE will provide targeted professional development resources.

Of course, there is no sense in mapping user needs at a detailed level if the modularity of the content cannot support it. While CBT programs may have succeeded in allowing people to be trained at their desk, for example, they have largely failed to provide self-

directed task-level instruction. Task-oriented information is critical to raise the confidence of the user that the information they are provided has real value in helping them achieve their short-term goals.

Task-oriented information involves providing a user with only what he or she needs at a particular moment in time. This is accomplished through the architecture of modular content. In this context, a content module (or *object*) contains just enough information to provide an answer to a particular query. When more complete information is required, such as for skills-oriented or competency-oriented queries, multiple objects can be grouped together dynamically, and packaged and presented to the user as a unit of instructional information.

In order to implement an efficient performance improvement environment, it is critical to blur the lines that have traditionally existed between training and support. The problem exists when too much emphasis is placed on up-front training which is not provided at the point of true need. Even the word training infers a certain connotation for many business managers that is often negative. A recent article in *CIO Enterprise* (January 15, 1998) stated that "training is the near-unanimous choice of experienced ERP (Enterprise Resource Planning) implementers as the most elusive budget item...this cost is consistently underestimated." The article goes on to state that at least 10-15% of a project's budget should be dedicated to training. For many ERP implementations, this can be millions of dollars.

However, many ERP implementations take 12-18 months and leave a basic question unanswered. When is the right time to offer training? Should training be offered prior to beginning the project, during the design of the system, during the testing phase, or just after the system is implemented. The answer is most likely at all of these times, and more.

Many recent studies suggest that after two-to-four weeks, the average retention of a 40-hour class ranges from 10-15% or less. That means that at best, only six of the 40 hours have been retained. Chances are that the retained information involved the material the learner knew would be put to immediate use. This method typically leaves no alternative to the user but to call customer support later on when they have a question. In essence, the training investment has been wasted and the focus ends up on remedial support.

Of course, training continues to be an important part of the performance improvement picture. The efficiently deployed performance environment will provide short courses of training, either through abbreviated classroom events or completely online. These short courses of training can provide a basic backdrop of knowledge against which performance improvement can occur incrementally through just-in-time training or online performance support. One can easily imagine many 3-5 day courses that could be shortened to

one day, with the addition of a guide showing how to rapidly find the information from the remaining days of the course. It would help users find additional information after the conclusion of the course. This would help establish training as more of a continuous process rather than an intermittent activity.

A performance improvement approach to training allows people to move away from intensive learning exercises and focus on empowerment. It places less emphasis on rote learning of the subject matter and more time on teaching users how to find and use information they need when they need it. This method has the potential to greatly accelerate the achievement of high productivity for most people.



C O N T E N T - N E U T R A L . Very few major corporations can have all of their needs met through a single content vendor, single media type or single approach to learning. In fact, it is not uncommon for those corporations that have made a commitment to computer-based training to buy their courseware from numerous vendors. Moreover, with the growth in Intranet technologies, there are now multiple ways to deliver material, including HTML, multimedia, video, collaboration and others. A performance improvement environment must be able to support all of these delivery mechanisms together in one heterogeneous environment so that it is largely transparent to the learner.

For example, an employee orientation curriculum will likely contain a diverse set of information, ranging from corporate policies, specific training on the latest products, and sample marketing material, to technical training and assistance from experts online to help get them through their first few weeks. The sources of this information could include an internal website, a set of presentations on video, a set of PowerPoint or Director-based presentations, vendor-supplied CBTs and an online chat session or newsgroup. All of these have to be delivered and managed seamlessly to optimize the experience of the user.

L E A R N I N G M O D E L / D E S I G N / S T Y L E - N E U T R A L . Performance improvement professionals draw upon myriad theoretical models and paradigms in constructing training resources and in designing and formatting information to optimize usefulness for the targeted audience. Rather than force instructional and information designers to choose a particular approach to design, a successful performance improvement environment must be able to support all theoretical approaches, just as it supports all types of content and sources of that content.

Furthermore, users, through their learning preference indications, will require a variety of presentation styles. Some will want text only without audio because of their bandwidth constraints, some will need audio with animation to accommodate the needs



posed by especially complex content or limited reading skills. Again, a PIE must have the flexibility to support and accommodate all these variations.

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Eric Gomberg
&
Anne Derryberry

INTRA - / EXTRA - / INTERNET - DELIVERED. Most of us are familiar by now with the impact of the Internet and the World Wide Web on the individual's ability to access information. What we are less familiar is the potential of the corporate Intranet for providing relevant information to employees when they most need it to solve a business problem. In a recent survey by Georgia Tech University (Filipczak, 1997), it was pointed out that over 80% of the Fortune 500 corporations surveyed have implemented an Intranet. However, there were no consistent use patterns reported, and the use of the Intranet often remains a limited and inconsistent resource.

Performance improvement environments leverage the investment in an Intranet by optimizing the user learning experience so that interactions are rapid and precise. These characteristics are a critical key to success in an environment which to date has been typically unstructured and unmonitored. For casual users satisfying curiosities about different topics, the Internet provides high value in this regard. For the business user, who needs to optimize her time and get what he or she needs quickly, the experience must be much more directed. An effectively implemented PIE achieves both.

MONITORING AND MANAGEMENT CAPABILITIES. In order to be effective over the long-term, a performance improvement environment must undergo continual monitoring and optimization. This optimization occurs through constantly assessing the needs of the users, the proper mechanisms for learning and the characteristics of the content repository.

Performance monitoring has multiple components:

- *Mapping the changing needs of the learner to the proper sections of content.* The needs of the users will change over time and can become more and more individualized over time as the maturity of the PIE evolves. As users become more attuned to the ways of getting the answers he or she needs and the advanced training he or she desires, the PIE can better optimize the information channels that he or she uses. This may be reflected in refining the learning plans, tweaking search attributes or re-assessing a user's skills.
- *Carefully tracking the content usage statistics to optimize the repository.* Through monitoring capabilities such as usage reporting, the administrator of the PIE can weed out that content that is not being used and further invest in the content areas that are in high demand. The more mature the PIE gets, the more it is



attuned to the needs of its users. This optimization of content can save a significant portion of any training investment.

- *Linking the usage of the PIE to measurable business results.* A common application of a PIE is in the area of front office organizations – help desks, sales organizations and field services. Help desk personnel can achieve meaningful business results through the increase in call closure rates. Sales personnel can see an increase in the number of selling days per quarter and the reliability of their sales by having better product and market information at their disposal. Field services organizations can directly increase revenue through higher utilization rates and better value to their customers.

Through continual monitoring and refinement of the information channels between learner and content, several benefits emerge. They are:

- a growing trust by the user for the quality and relevance of the content;
- significant cost savings by the corporation because further investments of upgrades are only applied to content areas which are required rather than an entire CBT library for example; and,
- a growing familiarity with the usage patterns by both the users and the administrator to further streamline the information retrieval.

A good measurement of the effectiveness of a PIE is whether users can find the relevant information they need within 60 seconds or less. This is a very aggressive goal but one that can be met if the mapping of user needs and content is well understood and optimized.

PIE BENEFITS

The sophistication of a PIE can range from solving simple communication needs to a robust and dynamic environment of content and learning mechanisms for thousands of users with different needs. The former may be solved by providing an effective, well-designed Web site used by employees for updates on corporate events or policies. The latter often requires support for a suite of heterogeneous content, multiple learning approaches operating concurrently and tailored knowledge delivery to thousands of users spread remotely across multiple sites. Either can be effective in solving a particular business problem. The specific benefits of a performance improvement environment include:

- significant improvements in profitability from increasing productivity and lessening training time and costs;
- Improved professional development of employees; and,

- a more streamlined repository of training and support information for the corporation.

Additionally, through the controlled implementation of collaborative mechanisms and tools, the interaction among a distributed set of employees will be improved.

Traditional training mechanisms can continue to be very effective for providing a group of individuals with a common foundation of knowledge. The problem lies in the separation this creates between learning and transferring learning to work, resulting in significant impact on cost and productivity. The cost of pulling a sales force or a field services organization into classrooms for several days is enormous, often running into the millions of dollars in hard costs and lost revenues.

As the electronic learning marketplace continues to mature, the value of moving beyond developing and providing discrete units of online courseware will become increasingly clear. Performance improvement environments offer the means of leveraging learning and information resources in ways that will best suit the needs of the particular organization. This targeted approach to learning will increase profitability and better integrate training and support into the work environment.

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Ellen D. Wagner, Ph.D.

CREATING
EFFECTIVE
ELECTRONIC
LEARNING

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Ellen has written over 60 articles and monographs and more than 125 national conference presentations and workshops on instructional design, interaction strategies, and a wide array of topics dealing with electronic learning. She currently serves as a member of the Board of Directors of the Division for Instructional Development, Association for Educational Communications and Technology and is a contributing editor for Educational Technology, Educational Technology Research and Development, and The International Journal of Educational Telecommunications.

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CREATING EFFECTIVE ELECTRONIC LEARNING

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HEN AN organization decides to support electronic learning as a strategic performance improvement initiative, that organization's training and development professionals will find themselves dealing with an array of new opportunities and challenges. When embarking on efforts to integrate technology tools in an organization's performance improvement environment(s), it may be especially useful to consider what some of the potential challenges to implementation may be. Setting plans in place to deal with potential problems is one of the best ways to ensure that the impacts of such problems are minimized. This underscores the importance of being aware of what some of the potential problems may be. The following examples represent problems reported by individuals involved in designing electronic learning resources during the past decade (Wagner & Ellis, in press):

- Learning experiences available via technology may or may not look like or work like learning experiences that people in an organization already “know.” For example, some people in your organization may resist electronic learning, saying that it isn't “as good as” what they have experienced in the classroom. The notion of accessing independent content objects* to support learning needs may well be beyond their immediate comprehension. How are you going to respond to resistance to change if and when resistance rears its head?

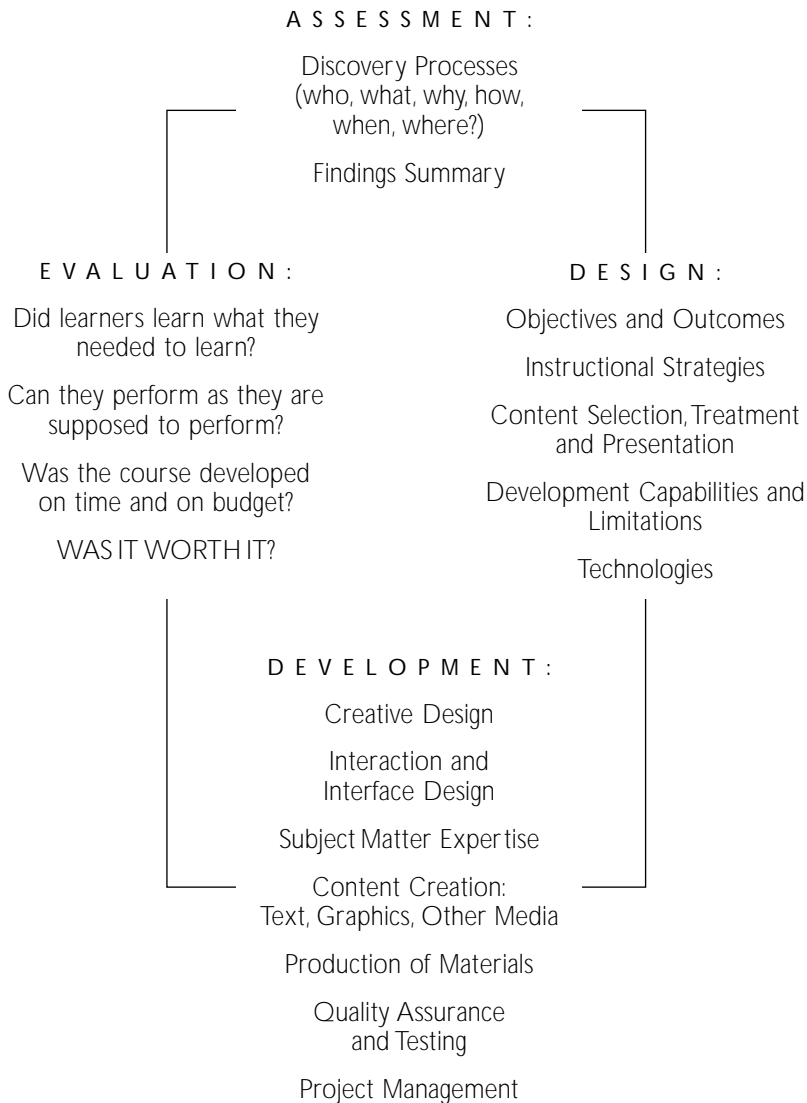
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* See Gomberg and Derryberry, *Performance Improvement Environments*, for a discussion of content objects.

- Tolerance for the limitations of traditional learning and performance support (such as instructor-led classroom-based training or quarterly new product briefings) may decrease when so many alternate means for accessing content are available. Where will people in your organization go for support for their immediate, “just-in-time” learning needs if you can’t schedule support when and where they need it?
- New media allow learners to access information they need when they need it, where they need it most. Clearly, strategies used for constructing learning designs must increasingly account for learner-determined and learner-navigated paths while keeping the company’s “bottom line” in mind. How will you respond to the independent learning and support needs and interest of your workforce while making sure that time spent on training tasks is still relevant to your company’s strategic directions? How will you help people determine where skill gaps exist so that they can focus on spending time on learning tasks that represent the greatest potential return on their investment of time and effort?
- Learning experiences of the future will very likely continue to emphasize content mastery. However, they will also be highly focused on increasing mastery of knowledge, skills, and procedures and processes relevant to individual and organizational success in the marketplace. How are you going to ensure that the content served to learners in your organization is the most relevant content to meet their performance improvement needs?

STAGES OF LEARNING SYSTEM DESIGN

When organizations embark upon new electronic learning initiatives, training and development staff may find themselves pushed to begin implementing programs that respond to specific tactical needs without considering what the general learning needs picture looks like at a department or an enterprise level. While this tactical approach may offer immediate relief for a specific performance problem, it may not help organizations address some of the more strategic issues that are encountered when one decides to invest in the intellectual capital represented by their employees. Many training and development professionals find that, for performance improvement initiatives to bring real value to their organization, they need to take a more systematic approach to considering what the learning needs of their employees actually are. It is then possible to propose solutions to learning problems that are likely to yield the kinds of results that justify making the investment. To this end, it is worth taking a look at the core activities associated with learning system design: *Assessment, Design, Development and Evaluation*.



A S S E S S M E N T . Assessment encompasses a range of activities used to determine variables that influence how learning and support experiences should be developed. Among other things, assessment considers the type and quality of performance that is expected upon completion of a learning experience and targets the essential tasks that need to be addressed as the learning experience is constructed. Assessment also examines the domain of the content to be included in a course or individual program of study. This ensures that the information needed for a topic to be adequately represented is actually included in content selection decisions, and often results in the establishment of content benchmarks related to the level and amount of content that a particular class of learners will need to achieve mastery. Content benchmarks are especially important



when electronic learning modules must be broken into content objects for inclusion in a performance improvement environment.

Assessment considers perspectives of a broad array of stakeholders, ranging from the learners for whom the course is intended, to the managers responsible for monitoring learners' progress, to the expectations of experts in the field, to the marketplace wherein "high performing learners" demonstrate their skill and content mastery. Assessment enables taking a close look at the attributes of the targeted learners to make sure that performance expectations and design elements (treatment, tone, and mode of presentation) of learning resources are articulated appropriately. Assessment also considers the context within which a learning experience is to be implemented, specifies the need for the technical support and ensures that resource scheduling has been addressed.

Some techniques used for conducting assessments include observations, extant document analysis, annual report reviews, surveys, reviews of literature, industry summaries, interviews, questionnaires, and user requirement workshops. Another rich source of assessment data includes summaries from course evaluations, instructor evaluations and program evaluations for related courses and resources. Recommendations for future research or summaries of "next steps" from evaluation reports also provide information that can be useful when compiling data from which to begin constructing a course design.

One area that presents electronic learning designers with a broad array of challenges is related to the technology, both hardware and software, needed to implement an electronic learning solution. Technology defines the attributes of a performance improvement environment in which any number of learning efforts (electronic or not) may be implemented. In most settings, answers to technology questions are directly influenced by perspectives held by the organization's IT or MIS staff. Training development professionals need to work closely with their organization's technology professionals to determine the impact that a proposed electronic learning design may have on technology infrastructure, services and support. At the same time, IT staff need to be increasingly aware that a technology solution alone will not be sufficient for meeting the needs of the variety of stakeholders that are typically involved in an enterprise-wide performance improvement effort. Assessment provides the means for figuring out opportunities and barriers to potential success before one travels too far down any particular path.

D E S I G N . Learning design efforts typically involve reviewing information collected during the assessment stage and constructing a proposal for meeting as many of the needs outlined by stakeholders as is feasible given context and circumstances. In constructing learning designs, whether at the enterprise level or the department

level, the intended audiences for learning resources are identified. Performance standards are established. Performance objectives and learning objectives are articulated. Primary and secondary resources for supporting the delivery of a learning experience are identified. Instructional strategies and tactics are specified. Any additional media needed to support the delivery of a learning experience are called out. The end result of an electronic learning design effort is a design “blueprint” that describes in great detail all of the elements of an experience that must be in place for that experience to be received as successful.

There are key elements of any learning design that are common among effective and implementable course designs. These include the following elements:

- *Objectives and Outcomes:* Learners need to know what is expected, and what they should be able to do as a result of an instructional or performance improvement intervention. Objectives should be stated using action verbs. They also need to consider the condition under which an expected performance is to be offered, and should consider what measures will be employed to demonstrate that an objective has actually been achieved.
- *Learning Strategies:* Learning strategies help define the approach to be used to make sure that content is presented in manner(s) appropriate for achieving intended outcomes. Examples of learning strategies include interaction techniques, learning activities, attentional and mnemonic devices. Learning strategies also consider learning styles and cognitive strategies likely to be employed by learners so that designs can complement the natural capabilities that learners bring to the tasks at hand.
- *Content Selection, Treatment and Presentation:* What needs to be said? How much information is enough? How can one tell if there is too much information for a given learning task? How should content be presented? If an array of content objects is being selected to train people to complete a particular task, what must be done to ensure some measure of consistency of pacing and presentation among the content objects? What kind of conceptual “wrap-arounds” are needed to provide a coherent presentation of independent objects? To what degree are content object users able to manage their own navigation among objects to achieve a particular learning outcome? Are the examples clear and relevant? Are they appropriate for all prospective members of a learning cohort?
- *Development Capabilities and Limitations:* Organizations need to make decisions about the degree to which they plan to get involved in the construction of learning resources they plan to deploy. Are they in a position to develop their own customized

teaching and learning solutions or will they use off-the-shelf courseware? Is the off-the-shelf courseware modular enough to be reused with a variety of learners in an enterprise? Will training and development staff be “replaced” by the introduction of automated performance improvement environments, or will these electronic environments allow training professionals to better support the real learning needs of an organization by being better able to respond to diagnosed skill gaps? Will there be support for learning resource maintenance?

D E V E L O P M E N T . Development involves the actual production of interventions called for in a specific learning design. In settings where commercially available content objects form the foundation of learning resources available in that environment, development activities may represent a very small part of the electronic learning picture. However, while training and development professionals may or may not be directly involved in constructing the interventions called for in a learning design, they must be familiar enough with the interventions being proposed to understand the constraints that may be encountered when actually constructing learning interventions.

An effective learning resource development plan needs to specify how the following range of activities is going to be accommodated:

- *Creative Design:* An appealing visual appearance requires some degree of input and participation from visual designers. If an intervention is not presented in an attractive, engaging, motivating way, even the most effective learning design in the world may not be able to capture the interest or participation of its intended audience.
- *Interaction and Interface Design:* The less ambiguous the intent of functional directions on a web page or a CBT screen, the more likely users will choose to engage in activities presented by means of that web page or screen. A well-designed user interface reduces the need for adjunctive training to use an online application. It can even increase accuracy of user responses because users can concentrate on the critical learning task instead of deciphering hard-to-read or hard-to-understand directions.
- *Subject Matter Expertise:* The credibility of a learning intervention is directly proportional to the accuracy of the information it presents. Subject matter experts (SMEs) play an essential role in conceptualizing, shaping and reviewing the information presented in an electronic learning design. Ensuring the validity of the content being developed establishes credibility with learners.
- *Content Creation:* Information presented to learners must be configured so that they can effectively use it. This means writing

it in a style and using treatments that offer the most appropriate perspectives for the electronic learning audience. This also means selecting or creating graphics, illustrations and tables that exemplify key points or summarize information in meaningful ways. “Wrap-around” templates may provide a presentation shell in which a variety of content objects can be displayed. As with any mediated instruction, it is critical to involve the multimedia, CBT, or WBT producers and developers in the process of content creation since their input has direct impact on the physical appearance of the content in presentation.

- *Systems Operation:* Well-written and well-produced resources can not have the impact they deserve if there are difficulties in getting the programming distributed to the right audience. Steps must be taken to ensure that servers are operational, that networks are configured appropriately, that client or learner machines have the appropriate capacity and connection capabilities, that the appropriate browsers and plug-ins have been installed.

EVALUATION. Evaluation is the process of interpreting information to make effective decisions. Evaluations help people make judgments about value, quality and importance. Typical evaluation questions include:

- Did the learners learn anything?
- Can the learners do what the design indicated they should be able to do? How is this demonstrated? Can they apply it in their work?
- Was it worth it?
- Would we do it again?

Electronic learning designers should keep in mind that in its simplest state, an evaluation may consist of nothing more than being able to use the results of one experience as the rationale for undertaking another similar experience. On the other hand, evaluation methodologies provide a highly rigorous means of quantifying impact, effects and results. From the perspective of an electronic learning design, the evaluation of learners’ performance through testing and performance appraisals can be used to determine whether or not stated learning objectives have been achieved.

SUMMARY

The process for creating electronic learning – and the management of that process – is as critical to the success of the effort as the creative effort put towards the instructional designs and the execu-

tion of electronic content. Modifying the time-honored approach to developing instructional materials to embrace the particular considerations of digital media will enable instructional designers to minimize their (and their organization's) transition to electronic learning.

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Learning without Limits, vol. 2



Anne Derryberry

MAKING THE
BUSINESS CASE:
PREDICTING ROI
FOR PERFORMANCE
IMPROVEMENT
ENVIRONMENTS
AND ELECTRONIC
LEARNING

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Under Anne's leadership, Informania has completed over 100 projects for business, industry, education and government organizations.

Each organization has realized productivity gains from their adoption of Informania programs to support "the business" of their respective operations.

Anne's award-winning work includes such projects as Apple Computer's multimedia-based training for networking products, which received a Cindy award. She designed Apple's online testing facility for delivery via Apple's proprietary electronic mail system. She also designed Tandem Computers' Solution Selling Performance Tool for Tandem's worldwide sales force. By conceiving and implementing the idea of an interactive website for the San Francisco Economic Summit, Anne helped the City of San Francisco set new standards for participatory democracy.

Anne's multimedia sales training program designed for Duty Free Shoppers (DFS) won a New Media INVISION award for multimedia training. Her conceptual design was the foundation for WEBLEARN™; the WEBLEARN™ core technology was at the core of a customer implementation for which Informania was awarded the ISPI Award of Excellence.

Anne's writings have been published in Technical & Skills Training, Educational Technology, Performance and Instruction, and in numerous conference proceedings. She is a frequent speaker both in the U.S. and abroad. She is also a former Chapter President of the International Society for Performance and Instruction (ISPI), and was track chair for the 1994 and 1995 ISPI Conferences. She has served as a judge for the New Media INVISION awards (the "multimedia Oscars") since 1994. Recently, she has been invited to join the Advanced Distributed Learning Initiative, co-sponsored by the White House Office of Science and Technology Policy and the Department of Defense, for which she leads the Business Forum on partnerships.

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MAKING THE
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URING THE PAST several years, training organizations have been pushed by their clientele – both external and internal – to be more accountable for the quality of the resources and services they provide. In fact, focus on accountability has reached such a level that many training organizations are finding themselves competing against other types of investment decisions to maintain their current, if not higher, funding levels (Lyau & Pucel, 1995). At the same time, training organizations are being pushed to offer more efficient means of accessing performance improvement resources and services. The push for accountability means being able to demonstrate that interventions have a direct positive impact on improving organizational competitiveness and increasing the productivity of individual contributors. The push for greater efficiency and accessibility has understandably led to expectations that interactive technologies will play an increasingly significant role in providing both services and resources.

Growing expectations that performance improvement interventions will increasingly depend on technology-based solutions requires the expansion of the essential skills required of high performing instructional designers and developers (IDs). One arena where ID skills expansion is becoming increasingly important is only indirectly related to technology proficiencies or understanding the dynamics of the teaching/learning process. This is the arena that deals with business decision-making. In particular, high performing instructional designers and developers will find their professional development well served by developing expertise in methodologies for determining return on investment (ROI).

Whether one works for a small consulting firm or a Fortune 500 training organization, ID practitioners must understand how to support and document the value that learning and performance improvement designs bring to their organization. Additionally, value must be demonstrated from multiple perspectives: shareholders, customers, management, and staff (Willyerd, 1997). This includes being able to articulate the cost-benefit of a recommended approach. Organizational expectations increasingly place designers and developers in situations where they must recommend a performance improvement design, must articulate the ways in which technologies must be deployed to achieve that design's intended outcome, and must make a business case to demonstrate the value of the recommendations they are making.

Despite time-honored, ongoing empirical debates about media effectiveness (e.g., Ross, 1994; Clark, 1994; Jonassen, Campbell & Davidson, 1994), heuristics for media selection (e.g., Tennyson, 1994; Casey, 1996; Choi, 1997) and the like, the reality of many contemporary ID practitioners' duties simply assume that technology deployment is a given feature of the design environment. Interactive technologies are increasingly called out as part of the defining conditions accompanying requests for design proposals. This arises from companies' interests in leveraging existing and future technology investments that may have been made with little proactive consideration for how those technologies could be used to support user learning and professional development. From a practitioner's perspective, it is essential for instructional designers and developers to know how to make the best business case for designing *and* implementing technology-based performance improvement environments that are at once responsive to the needs of learners, the organization and the bottom line.

Clearly, instructional designers and developers must be able to recognize opportunities for leveraging interactive technologies for improving both *individual* and *organizational* performance. The challenge in realizing these opportunities comes from understanding how to demonstrate the value that electronic learning and performance improvement environments offer for solving business problems as well as learning problems. Therefore, instructional designers and developers must be able to respond to two major challenges when identifying situations where a technology solution may be warranted:

- First, they need to ensure that the right design has been or is going to be selected, and that the criteria for making this assessment are clearly articulated, demonstrable, and reliable.
- Second, they must be able to “sell” a proposed solution. That is, they must demonstrate the value that a proposed learning or

performance improvement solution offers to funders, clients and users, and must be able to demonstrate value from the variety of perspectives mentioned above.

REVISITING TECHNOLOGY SELECTION CRITERIA

The decision to implement a performance improvement environment or an electronic learning system is a complex one, and is typically made after considering a variety of factors. Getting to that decision requires asking the right questions, such as:

- What is the nature of the performance deficiency that the intended solution is expected to address? What are some of the attributes of the targeted deficiencies?
- Is instruction or training the most appropriate intervention to achieve anticipated results? Would a performance support solution work just as well or better than instruction or training? Are both required? Is the core of the performance problem related to a need to build knowledge, skills, and competencies among the target audience? Is the real need related to information access?
- To what degree is technology able to respond to the identified deficiencies? To what degree can technology be used in lieu of existing methods of supporting organizational performance improvement?
- Who is the target audience? Are they site-bound or mobile? If site-bound, are they at a single location or campus, or are they distributed across multiple locations? Are they members of existing cohort groups, will they collectively constitute a new cohort group, or are they likely to demand services and resources as individual users?
- Every project has a budget. Is this one fixed or flexible? In other words, if increasing the project budget to include interactive technology could ultimately save or make more money for the organization, could additional funds be made available to support the project?
- Who else will benefit from this solution? What is the “trickle down” or “ripple effect” of this project? If others benefit, should these others pay their share?
- Is the person to whom you are making your business case the one who can approve it?
- What if the solution you recommend is different from what is requested or expected? What can you do if your recommendation exceeds the current budget?

- Who are the real decision-makers? Sometimes the gatekeeper (that is, the person designated to deal with project-specific personnel, resources and overall project management) may not be the decision-maker. Sometimes the designated decision-maker is simply representing the interests of the key stakeholder.
- Is interactive technology currently available in this setting? How widespread is it?
- If interactive technology is available, is it being used? If not, why not?
- If interactive technology is available, what kinds of resources are available to users currently? What are planned?
- Are these resources developed by commercial vendors, are they developed by a custom design firm, are they developed internally? What kinds of standards or protocols do they adhere to?

USING ROI TO SUPPORT BUSINESS DECISIONS

Many organizations are beginning to require inclusion of a cost/benefit analysis or return on investment (ROI) analysis to justify an expenditure such as what is required for a performance improvement environment or electronic learning system. Simply stated, ROI methods are used to demonstrate that the value of the benefits realized from using such a solution is going to exceed the price of its development and implementation. ROI and technology implementations clearly go hand in hand. Organizations actively look for ways to leverage existing and anticipated technology investments. For example, an intranet that may have been implemented to facilitate improved company communications may be a useful mechanism for distributing employee development programs. In another example, a fiber-optic data network may provide the means for distributing interactive video courseware among multiple campuses and campus sites. More to the point in this latter example, interactive video course delivery to corporate customers or partners may help offset the expense of the data network applications by providing an entirely new revenue stream to support the implementation. Consequently, it's important to remember that in applied settings, ROI is particularly valuable as a means to the end of making effective business decisions. In applied settings, research-styled methodological rigor is less the point than is developing well-supported rationales for ensuring that resources are being allocated in cost-effective ways.

Even so, ROI is not simply evaluation methodology focused on financial concerns. Technology decisions are often not just about the financial bottom line. Even if data suggests that a low-end non-tech-

nological solution may yield positive results, there may be a variety of organizational reasons that a low-end technology solution may not be as attractive to an organizational funder as is a more sophisticated, more costly technology solution. While ROI methods provide structure for systematically collecting, organizing and compiling data, the interpretation of those data and the resulting perception of value those data represent may be highly subjective.

ROI methods are typically most effective in environments where all of the “real costs” of doing business are considered in the calculations. An example of a “real cost” that is often overlooked is the cost associated with the extra time staff may be expected to spend to get a new program implemented. Technological innovations often make their way into a company as a result of staff willingness to take on design and development responsibilities in addition to their regular job responsibilities (these are often referred to as “skunkworks” projects). It may not actually cost “more” to have staff putting in extra time on project implementation, but by not tracking and including these time-on-task figures, a highly skewed view of the implementation may emerge.

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*Making the
Business Case:
Predicting
ROI for
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Learning*

TECHNOLOGY-ORIENTED INPUTS TO ROI DETERMINATIONS

Traditionally, ROI analysis has looked at financial data by reducing all variables to dollar amounts and their impact on the “bottom line.” If the amount of revenue produced by the intervention exceeds all the costs associated with the intervention itself, or if the overall reduction in expenses is greater than all the costs associated with the intervention, then the intervention is said to generate a positive return on the investment. If the reverse is true, then the intervention causes a negative return on the investment. When deciding between an interactive technology-based intervention versus some other type(s) of intervention, ROI calculations for all proposed interventions are compared. Generally speaking, a project that anticipates the greatest positive ROI is more likely to be approved.

In compiling a traditional ROI for a performance improvement environment or electronic learning system, many factors need to be considered. Beyond the basic expense items for development, the cost side of the equation includes some “hidden costs,” including:

- Purchase of new equipment and upgrades of equipment over time.
- Software updates, including the time-on-task for the development team, programmer analysts, subject matter experts, beta testers, and quality assurance staff for each revision cycle.



- Costs of packaging and distributing software and software updates.
- Training costs associated with using the intervention.
- End user technical support.
- Telephone and network access and service charges.
- Paper/printing costs for making “hard copies” of electronic documents.

There are often “hidden benefits” associated with technology-based interventions as well that need to be factored into a thorough ROI analysis. Examples include:

- Usage of owned but underutilized technology.
- Standardized interactive technology-based training and/or support yielding more consistent results than human-based training and/or support.
- Reduced downtime on the part of trainees and/or target audience when compared to other kinds of training or support interventions.
- Reduced expenses on the part of trainees and trainers as compared to other kinds of interventions, particularly when a distributed or mobile workforce would require a substantial travel budget.
- Ease of creating and distributing content updates.

ROI analysis need not end with the traditional quantitative measures, however (McLinden, 1995). There are a number of other somewhat less tangible factors that have a legitimate place in this examination. These include:

- *Reduction of turnover.* In a situation where turnover is high due to a perceived lack of opportunity, electronic learning systems and performance improvement environments can offer employees skills development opportunities that open up new avenues of growth within the organization. These cost savings can be calculated if the full measure of hiring, training, outfitting, and supporting replacement personnel can be accurately calculated.
- *Improved morale.* Organizations that experience low morale due to a perception that employees are not highly valued can correct that perception by an investment in performance improvement and electronic learning. This investment can be correctly seen as an investment in the employees themselves.
- *Disenfranchisement.* An electronic learning system, when implemented entirely in place of a traditional classroom-based train-

ing program, can cause people to feel disconnected from the organization – this is far less true than with a performance improvement environment, because of its interactive and communication components – particularly when they are mobile workers. This can lead to decreased productivity, morale problems, and turnover, each of which has a cost associated with it. To offset this, other kinds of programs may need to be implemented, and those costs must also be accounted for.

- *Increased usage of training and support programs.* By making an investment in electronic learning or a performance improvement environment, an organization signals the importance and value it places on training, support, and professional development. This, in turn, can motivate employees to avail themselves of these resources, thereby enhancing their own value to the organization.
- *Competitive advantage gained through usage of leading-edge interventions.* Until interactive technology is the norm, those organizations that adopt it for employee development will be recognized as leading-edge. Often, the cachet that accompanies this perception is the belief that such an organization provides leading-edge product and service to its customers and to the marketplace.

These factors will vary by project and by organization, and may require some creativity in devising appropriate measurement methods. They are nonetheless important factors in assessing the value of a performance improvement environment or electronic learning system.

Philips suggests that ROI is a fifth-level addition to Kirkpatrick's four-level evaluation model (1998). Instructional designers who have conducted program evaluations using Kirkpatrick's evaluation model may notice strong parallels between this expanded view of ROI analysis and each level of Kirkpatrick's evaluation model. Indeed, the design of the front-end ROI analysis and the program evaluations can and should be conceptualized simultaneously so that inputs and outputs to the assessment and evaluation efforts are consistent. In all cases, special care must be given to ensure that changes or values that are being attributed to the performance improvement environment are not, in fact, the result of some other influence (Lachenmeier & Moor, 1997).

MAKING THE BUSINESS CASE: ROI IN ACTION

In order to ground these ideas in real-world examples, the author has drawn upon recent experiences with corporate clients to show how ROI methods can be applied to support a recommended course of action – that is, to make a business case – regarding spe-

cific performance improvement recommendations involving interactive technologies. The point of these examples is to demonstrate how ID practitioners were expected to make a business case to support a particular technology intervention recommendation and to describe what happened as a result of the client's response to the business case. Identities and specific details of these cases have been masked to comply with nondisclosure requirements associated with each project. Readers are encouraged to contact the author if additional information or specific data per case is needed.

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Anne
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BUSINESS CASE 1:
SUPPORTING SALES TRAINING
WITH TECHNOLOGY-BASED
DECISION-MAKING TOOLS

A computer manufacturing company adopted a proprietary sales methodology for its mobile sales force. There were only five authorized trainers to instruct staff on how to use this methodology, and there were over 1,400 salespeople worldwide who needed this instruction. The company was concerned that taking the several months to get the entire sales force trained in the new methodology would reduce their competitive advantage in the marketplace. As an alternative to this approach, an intranet training and support system was recommended. Salespeople located anywhere in the world would be able to access the training site via their laptop computers; online decision-making tools available via the intranet would assist sales staff in modeling the new sales methodology.

The ROI analysis conducted to determine the feasibility of the intranet approach compared the costs of developing the software and implementing and deploying the intranet strategy versus the enormous travel and downtime budget of the traditional training and re-training approach. It factored in lost opportunity costs due to a delayed roll-out of the strategy versus time to develop the intranet system. Also considered were additional communication advantages provided to the sales organization that could be shared by all other parts of the company. The analysis included the projected loss of revenues due to the disruption in productivity associated with the technology implementation and the culture shift that a technology strategy would impose.

While the raw numbers actually suggested a negative ROI for this strategy, the intangible benefits were perceived as far greater than the costs. Consequently, the intranet strategy was adopted.

After a rocky implementation period during which complaints were fielded regarding the so-called "loss" of training privileges, sales staff saw that the online decision-making tools helped increase their sales numbers while also helping to reduce the time it typically took for customers to make buying decisions. Sales are up, due in part to



this strategy. Morale is up, since field-based sales staff feel as if their performance is being better supported than in the past. The perception of competitive advantage has improved since sales staff model the company's computers in applied business applications. In the past two years this strategy has become a core component of the overall business practices of the company.

BUSINESS CASE 2:

SUPPORTING WORLD-WIDE PRODUCT SALES TRAINING

In looking for a way to differentiate themselves in the highly competitive network operating system market, a multinational computer software company decided to promote a solutions-oriented sales methodology for both its internal sales force and its third party sales channel partners. They announced that the goal of the new methodology was to increase global sales by 4%. The team responsible for implementing the new methodology decided that the best approach for rolling out this new sales strategy on a world-wide basis should feature a series of self-directed workbooks and several instructor-led classroom-based seminars. Ten members of the company's internal sales staff completed a "Train the Trainer" professional development program and began scheduling face-to-face courses at locations around the world.

After six months, preliminary feedback on the success of the program was mixed. Product information was changing at such a rapid rate that it was difficult to keep materials current. Workbook translation ("localization") had not been completed. Registrations for the instructor-led seminars were low, since salespeople were unwilling to commit two days away from selling to attend the seminars. The logistics of shipping instructors to training sites around the globe were more complex and expensive than had been anticipated.

A Discovery Audit was conducted to ascertain features of a performance support system that would meet the needs of the intended customer base. The assessment indicated that there was high interest in having access to web-based information resources to keep salespeople apprised of new product features, sales tools, cost-benefit calculation tools and new training resources. An ROI analysis was conducted as part of the Discovery Audit to compare the costs of developing and updating print-based information and instructional resources with web-based information and instructional resources. Included among the costs were those associated with managing the print-based resources such as warehousing, packaging and shipping expenses. It also factored in the costs of providing global access to the Internet.



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In spite of being able to use ROI data to demonstrate that a web-based resource distribution strategy improved product reach, reduced resource revision time, and responded to customer time constraints, the corporation decided to maintain the current approach to courseware development and distribution. The product sales training instructors and staff management persuasively argued that the six-month ramping-up period had not provided a completely accurate picture of their success. They also persuasively argued that global Internet penetration was inconsistent, and that a web-based strategy was “ahead of its time”.

Following another 10 months of workbook and instructor-based resource distribution, the product sales training unit was still unable to achieve their projected numbers. Localization of print-based resources lagged by as much as 12 months from resource release dates. Web-based requests for product information increased during this same period by approximately 10,000-plus hits per month. Shortly thereafter, the product sales training group was disbanded.

BUSINESS CASE 3:
COMPETENCY ASSESSMENT
AND PERFORMANCE PRESCRIPTIONS
VIA THE WORLD WIDE WEB

The absence of a corporate training strategy left a multinational medical supplies wholesaler with many ad hoc training initiatives that produced inconsistent methods of operation, procedures and employee performances throughout the company’s distributed workforce. Recent mergers and acquisitions focused the spotlight on this problem as the organization grappled with blending cultures and retraining acquired personnel to the company’s way of doing business. This company is committed to being the leader in its industry; they believe the right training and development strategy is a significant contribution to making this happen. Upon completion of an organizational Discovery Audit that considered performance measures, learning outcomes, and financial measures, this organization decided to build an intranet-based training support system. It included a system component that enabled employees to assess their own performance via the Web, and determine their skill deficiencies. The system also provided an “intelligent advisor” to guide users to courses and other resources to help improve their competencies in diagnosed areas. By virtue of being delivered via the company’s extranet, it could be accessed by employees anywhere in the world via their desktop or laptop computers.

An ROI analysis conducted to examine the feasibility of this approach compared the costs of building and implementing a technology solution versus a more traditional face-to-face, training cen-

ter solution. The ROI considered additional hardware and infrastructure costs versus travel and downtime costs of trainers and trainees. It looked at morale issues associated with culture changes caused both by the mergers and by implementing technology solution. It also considered the readiness of long-time, middle-aged, non-computer-literate employees to adopt a technology strategy and the hidden costs associated with training and supporting users of the extranet system. It then factored in the value of consistent, comprehensive, readily accessible information via technology versus time-delayed human-delivered training and support. Finally, it attempted to account for the perceptual value that a technology solution brings to the company's attempt to become the industry leader.

The Discovery Audit's Findings Report indicated that the extranet strategy was a clear winner. In addition to the power that the system provides from a professional development perspective, it is viewed by the company as an indicator of its leadership in the industry. However, because of the culture shifts that are occurring within the company, it was determined that not all training elements would be delivered via interactive technology. While the training infrastructure was to be managed online, courses would continue to be available in face-to-face, and self-directed modes, as well as via the World Wide Web.

CONCLUSION

An expanded approach to ROI, one that includes ensuring that the appropriate intervention is being recommended coupled with both a quantitative and qualitative analysis of the value of the intervention, can strengthen any recommendation instructional designers make to clients or funders. ROI in any form, like evaluation methodology (Phillips, 1991), is most effective when viewed as an input to making well-founded, data-supported business decisions. By undertaking this kind of examination, instructional designers are sure to consider the broad-reaching effects of their interventions and can offer a strong business case, regardless of what direction the examination leads them.



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Rebecca L. Smith

MANAGING CHANGE:
A SYSTEMATIC
APPROACH TO
IMPLEMENTING A
PERFORMANCE IMPROVEMENT
ENVIRONMENT

—



Rebecca L. Smith

REBL SYSTEMS

REBECCA SMITH is the Principal of RebL systems, a consulting firm focused on business process and workflow management design and implementation. She works with business and technical executives to create and implement processes that improve knowledge workers' integration of constantly changing customer requirements, emerging technologies and business issues.

Rebecca has contributed to several Silicon Valley firms by developing processes and leading the systematic implementation of software engineering methods and tools that reduced development and maintenance costs, shortened product "time-to-market" and improved software quality for several R&D labs. She also directed a company-wide quality and productivity effort to redesign internal management processes. The business measurement system she established featured customer satisfaction and product performance metrics.

In addition to these company-specific contributions, Rebecca's experience and key areas of professional focus include: creating product implementation strategies and documenting the impact of the performance support technology infrastructure on customers' business results; designing and implementing workflow management processes that reduced a Fortune 50 Corporation's costs and response time to meet customers' expectations and ensure work/life balance for employees; leading design and initial implementation of a cross-organizational infrastructure to deploy business processes and supporting technologies to facilitate worldwide delivery of integrated technology support services; designing and implementing an integrated Enterprise Call Management system to provide on-line and off-line technical assistance and customer support for more than 15,000 worldwide desktop users; and designing and obtaining funding to implement a system for maintaining a technically proficient work force in several Silicon Valley companies.

RebL systems clients include: Hewlett-Packard Company; Sun Microsystems, Inc.; Bay Networks; ALCOA; Stanford University; Silicon Graphics, Inc.; Tandem Computers, Inc. and Adia Personnel Services.

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MANAGING CHANGE:
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ENVIRONMENT



PERFORMANCE improve-
ment environment (please see the Gomberg and Derryberry article in this publication) is a powerful facilitator for knowledge workers' acquisition of essential job knowledge and skills. The value of the environment can best be realized when a company thoughtfully and systematically pursues its deliberate implementation by identifying the critical business success factors and designing and managing the effective transition from existing training and education practices to a true performance improvement environment.

Implementing a performance improvement environment can represent a significant change in how an organization leverages its intellectual capital. And, just as every organization is unique, so each implementation of a performance improvement environment is unique. The configuration of the environment, the content objects it contains, the users and their usage requirements will all vary according to the particular organization's needs. Nonetheless, a systematic approach to change management can greatly smooth the transition to and implementation of this new and innovative way of supporting, training and developing its employees. This article describes a change management process that offers strategic and tactical tips for performance improvement environment implementation.

PREPARING FOR IMPLEMENTATION

Once an organization's management team has decided to install a performance improvement environment, implementation does not

automatically follow. Integrating the administration, technology and content infrastructure of the performance improvement environment with a business' existing, formal and informal knowledge and skill delivery methods must be thoughtfully executed.

Pulling all of these considerations together typically requires the formation of a team chartered with precisely this task. Team members should be drawn from each of the key stakeholder groups related to the implementation. This serves the additional purpose of identifying champions for the initiative who will drive the solution through the organization.

The team will decide whether they will perform all the work of the implementation themselves or will act as the subject matter experts and represent the organization throughout the performance improvement environment implementation that they, or an external vendor team, manage.

PHASES OF IMPLEMENTATION

There are four phases that must be completed to effectively implement a performance improvement environment. The phases are:

- Assessment
- Design
- Pilot Test
- Roll-Out/Full Implementation

A S S E S S M E N T . The information gathered from the assessment provides information about the company's unique context and articulates requirements for performance improvement environment installation. Performance improvement environment implementations require a comprehensive understanding of the following factors to ensure an effective integration throughout the company or business unit:

- *Business:* Such factors include business strategies, goals, objectives, budget, product types, global and local economy issues, competition, customers, markets, culture, customization of products and services, regulations, raw material availability, and availability of skilled knowledge workers.
- *Organization:* Factors likely to affect implementation include the company's management practices, business and workflow processes, product creation cycle time, product development methods, manufacturing, order processing and service delivery practices, sales quotas, demand for skilled employees, rate of technical obsolescence, staffing practices and turnover, physical

location, competencies, firm-specific training, and organization policies and procedures.

- *Technologies and Tools:* These include technology availability, the use of technology to meet business objectives, strategies for technology deployment, job performance support, demands for information technology/systems infrastructure such as rates of new technology or application introduction, rate of adoption of new technologies, and access to technologies, patents, and copyrights.

Defining the unique context and company-specific requirements leads to their translation into clear business objectives, sometimes referred to as a “burning platform” for the company. Some of these objectives will be answerable by a performance improvement environment and some will not. Listen for business objectives that sound something like these:

- “Reduce the cost of delivering product training to the worldwide sales force.”
- “Accelerate the rate at which the sales representatives apply new product training information.”
- “Improve call closure rates in the HelpDesk.”
- “Reduce the response and problem resolution times for support engineers.”

The best way to illustrate how to plan, launch and maintain a successful performance improvement environment implementation is to consider how this process might work in the context of a hypothetical corporation: NTA, Inc.

During the Assessment Phase, NTA, Inc. identified a key business objective:

“At the beginning of Q3 sales representatives were only meeting 80% of quota. The current calls-to-closure rate is too low to meet the fiscal year’s sales goals. Sales representatives need to improve their results or the company will not meet its profit goal.”

The Assessment Phase must also clearly identify potential *performance gaps* in the current system and articulate the objectives essential to the success of the business. A sample NTA, Inc. performance gap may look something like this:

“Sales representatives are not as knowledgeable of the new products and cannot properly position the company’s products with respect to the competition.”

NTA, Inc., properly determined that the situations represented by both these statements could be addressed through their performance improvement environment.

D E S I G N . The performance improvement environment installation will be designed to enable the company to specifically address the burning platform, or key business objectives. There are three major activities that must be included in the Design Phase:

- Design the knowledge architecture of the performance improvement environment.
- Ensure the content is properly designed and capable of providing essential training and support information.
- Decide how to best integrate the performance improvement environment into the company's existing technology infrastructure.

Specific to NTA, Inc., successful design guarantees that the sales representatives can quickly complete the new product training "learning objects" and acquire the specific knowledge they need to better represent our company's products in the marketplace.

The overall implementation strategy must be incorporated into the Design Phase. Engage managers and individuals who represent the appropriate functions within the organization (they should be found within the ad hoc implementation team) to assist in the design of the implementation strategy. This ensures the performance improvement environment has the support of management and that employees will be supported, and even possibly rewarded for using the performance improvement environment to secure relevant job knowledge. It will also help demonstrate that the environment is consistent with the company's approach to improving job performance.

For NTA, Inc. to address the sales representatives' product knowledge requirements, a team made up of the VP of Sales, Field Regional and District Sales Managers and Sales Representatives, product/business unit marketing managers, sales training and support teams and the internal, Information Systems/Information Technology team responsible for implementing performance improvement environment's technology infrastructure will work together to determine the most effective way to implement this change. The outcome of this team's effort is an implementation design and a plan to manage the business, technical and staff issues regarding the installation of this Environment.

P I L O T T E S T . Pilot tests are useful in identifying unforeseen challenges prior to full implementation. Test the performance improvement environment by implementing it for a team that is



representative of the larger business unit or organization. Information learned in the Pilot Test will then be integrated into the final roll-out plans.

At NTA, Inc., install the performance improvement environment in one sales district with a limited set of products upon which the sales representatives are to be trained. The pilot test should be designed to portray the sales representatives' reality as closely as possible and identify the technical issues that will be encountered during roll-out and ongoing support of the performance improvement environment.

R O L L - O U T . There are several key steps to accomplishing a successful roll-out of a performance improvement plan:

1. Plan the company, business unit roll-out of the performance improvement environment.
2. Incorporate that which was learned in the pilot, and correct any design problems.
3. Determine the sequence, breadth and depth of the implementation.
4. Complete implementation of the performance improvement environment.

During the roll-out phase constantly evaluate initial acceptance and use rates. For example, determine the percent of sales representatives who actually pursued the learning objects in the performance improvement environment and track their sales results. It is also important to further evaluate the effectiveness of the performance improvement environment in meeting the business objectives. If the sales representatives who used the performance improvement environment increased their sales quota, and those who did not use the performance improvement environment did not improve their closed sales rates, then, all other things being equal, it can be assumed that the performance improvement environment had a direct impact on the company's business results.

T H R O U G H O U T T H E I M P L E M E N T A T I O N P R O C E S S : Because moving to a performance improvement environment is a major change effort for a business, the transition must be managed deliberately. To be effective, the four phases of performance improvement environment implementation must be framed within a clear transition management strategy adopted by the company or business unit. There are critical actions to be managed by the performance improvement environment implementation team:

- Create and set the vision for moving to the performance improvement environment – create a picture of the “future state” of acquiring job knowledge for the organization.
- Communicate the vision – enable the new way of acquiring job-specific knowledge and skills to become a “way of life” in the company or business unit.
- Build commitment to the vision by addressing the following fundamental themes of change management:
 - Clearly articulate and gain buy-in for the *mission* (or reason to be) for the company;
 - Gain commitment to the corporate *identity* or outside image to be portrayed to customers and stakeholders;
 - Clarify and build relationships with the key *stakeholders* in the move to the performance improvement environment ;
 - Define and gain clear understanding of the way *work* can be performed with on demand performance support capabilities available through the performance improvement environment; and
 - Clearly identify the *culture*, or set of values and assumptions that distinguish a particular company from others that guide actions in the organization. That is, make it clear that invoking the performance improvement environment is a positive, desirable and rewarded activity in the company or business unit.
- Organize the staff, and what they do, so they are *aligned* with the vision. Be sure to integrate the roles, management systems and rewards for using the performance improvement environment. For example, incorporate measures of learning objects pursued into staff performance evaluations.

CONCLUSION

A performance improvement environment can be a powerful facilitator for knowledge workers’ acquisition of essential job knowledge and skills. The real business value of the performance improvement environment can best be realized when the company thoughtfully and systematically pursues a formal change management process as part of the implementation plan. This will call for identifying critical business success factors and designing and managing the effective transition from existing training and education practices to a comprehensive environment designed to encourage and support improved performance.

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