

Blended eLearning

Integrating Knowledge,
Performance Support,
and Online Learning

Learning

Larry Bielawski, D.Sc.
David Metcalf, Ph.D.

Blended eLearning

*Integrating Knowledge, Performance,
Support, and Online Learning*

By

**Larry Bielawski, D.Sc.
David Metcalf, Ph.D.**

HRD Press Inc. • Amherst • Massachusetts

Published by: HRD Press, Inc.
22 Amherst Road
Amherst, MA 01002
(800) 822-2801 (U.S. and Canada)
(413) 253-3488
(413) 253-3490 (fax)
www.hrdpress.com

First Edition, First Printing

Copyright © 2003 by HRD Press, Inc.

All rights reserved under International and Pan-American Copyright Conventions. No part of this book may be reproduced in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from the publisher. All inquiries should be addressed to HRD Press, Inc., 22 Amherst Road, Amherst, MA 01002. Published in the United States by HRD Press, Inc.

ISBN 0-87425-717-4

Production services by Jean Miller
Cover design by Eileen Klockars
Editorial work by Sally Farnham

Dedication

To our loving wives—Malyce and Katy—this book would not be possible without your love, patience, and support.

This page intentionally left blank

Acknowledgements

We would like to thank all of the individuals and groups that have contributed to this work either directly or indirectly throughout RWD Technologies® and Latitude360 and the eLearning industry at large. In particular, we would like to thank Dr. Robert W. Deutsch, Dr. David Yager, and Ken Rebeck of RWD Technologies® for their support of this project and use of RWD Technologies® materials throughout the book for illustration and case studies. We would also like to thank our many contributors and the software vendors who have allowed us to share excerpts of their white papers, strategies, case studies, and thoughts on blended eLearning. Special thanks goes to our editor, Chris Hunter at HRD Press, who shared our vision for this book and was patient enough for it to become a reality.

Personal Acknowledgements

Larry Bielawski—I would like to thank my many academic colleagues at Goucher College and the University of Maryland for their support over the years.

Personal Acknowledgements

David Metcalf—I would like to thank my professional and academic colleagues at NASA, Nova Southeastern University, Webster University, and Walden University. I would also like to thank my parents, David and Jan, and all of our family for their encouragement, especially my wife, Katy, and son, Adam. Most of all I thank my Lord Jesus Christ for the perseverance, intellect, and opportunity.

This page intentionally left blank

About the Authors

Larry Bielawski, D.Sc. is the chief eLearning Consultant with RWD Technologies® and has over twenty years of diverse work experience in information technology, knowledge management, and eLearning. He has contributed widely to the *University360* project at RWD Technologies® and previously held the Alonzo G. Decker Chair in Information Technology at Goucher College in Baltimore, Maryland. A frequent speaker at national conferences, he holds a Doctor of Science degree in computer science and is also the author of five books on computing technology and knowledge-based systems.

David Metcalf, Ph.D. is Chief eLearning Technologist at RWD Technologies® and is responsible for the analysis, design, and strategic alignment of RWD's technology solutions for learning. Formerly of NASA's Kennedy Space Center, Dr. Metcalf directed the Web Interactive Training (WIT) project at NASA that produced several award-winning, web-based training applications. Recently a recipient of Brandon Hall award for wireless eLearning, Metcalf holds a Ph.D. in information systems from Nova Southeastern University.

This page intentionally left blank

Table of Contents

Foreword	xv
Introduction—A Time for Blended eLearning	xix
Chapter 1: Scope and Applications of eLearning Systems	1
A Bullish Outlook for the eLearning Market.....	4
Three Major Market Segments of the Industry	8
Where is the eLearning Market Today?.....	9
A Market Whose Time Has Come.....	10
Uses That Go Far Beyond Training	13
What Do Online Learners Think about Their Experience?	16
Why eLearning?.....	17
Who’s Selling eLearning?.....	18
Where to Turn Next?.....	19
Digital Surrounds.....	22
The Overall Objective.....	23
Content Is Queen, Context Is King	24
Technology: How to Flip the Switch Smoothly	25
Going Beyond Today’s Blended Learning Model	27
Chapter 2: Performance Support Tools	29
Current Generation EPSS Implementations	35
The EPSS-KM Connection.....	36
Blended eLearning Through EPSS and KM.....	42
Chapter 3: Knowledge Management Systems	43
Defining Knowledge Management	44
Developing a KM Strategy.....	49
Technology Solutions for KM.....	50
Past KM Successes	51
Knowledge Management and ROK	52
KM’s Contribution to eLearning and Performance Support Practices	55
Applying KM to eLearning Problems	57

The Application of KM to Blended eLearning.....	59
KM Resources.....	60
eLearning/KM Case Study: Hyperwave.....	61
Chapter 4: Integrated Blended eLearning Solutions	67
Creating a Blended eLearning Process and Infrastructure.....	69
Launching and Tracking Blended eLearning Solutions	72
Learning Challenges and Applying Knowledge Within the Blended eLearning Model	73
Successful Blended eLearning Solutions.....	76
The Blended eLearning Decision Matrix	77
Applying the Decision Matrix for Blended eLearning	81
Blended eLearning Solutions as a Process.....	82
Case Study: University 360	85
Blended Learning Through <i>University 360</i>	88
The Adult Learning Model and Content Development ...	89
Chapter 5: Instructional Systems Design for Blended eLearning.....	91
Overview of ISD Approaches	91
Case Study: The RWD Technologies® Total Performance Support Model.....	92
Additional ISD Theories That Can Actualize Blended eLearning	95
Developing Content for Combined Learning Models.....	101
A Sample ISD Methodology—RWD iVision™	102
Chapter 6: Case Studies and Best Practices.....	115
Honeywell	116
3Com® University™.....	118
IBM <i>Basic Blue for Managers</i>	123
Northrop Grumman	129
BAE.....	132

Chapter 7: Analysis, Profiling, and Change	
Management Strategies for Blended eLearning	137
The ROI and ROK of Blended eLearning.....	137
A Practical ROI/ROK Generator for Blended eLearning Solutions.....	138
Capturing ROK Metrics	140
Capturing ROI Metrics	144
Developing and Using Stories Associated with ROI/ROK Gains.....	145
Case Study: Learning Profiles, Career Planning, and Development Within a Blended eLearning Solution (HRD Press)	145
Change Management and E-Learning	151
Centra’s Blended eLearning Guide	160
A Blended Learning Strategy Guide	162
Chapter 8: LMS Strategies for Human Capital	
Development and Management	165
Overview	165
Human Capital Development and Management	166
Integrated Learning Management Systems	176
Case Study: Learn360 LMS Supporting Blended eLearning	180
Chapter 9: Learning Content Management Systems.....	185
What is an LCMS?.....	185
Reusable Learning Objects (RLOs)	187
Standards.....	188
Metadata.....	188
Industry Examples of LCMS Technology Approaches.....	193
Vendor Approach #1: Learning Content Management and Jupiter™ Technology from Avaltus	194
Vendor Approach #2: TopClass Suite—A Complete eLearning Content Solution from WBT Systems.....	210

Chapter 10: Media, Collaboration, and Synchronous Tools..	225
Rich Media	225
Techniques	228
Audio and Video Production	236
Best Practices List.....	236
Case Studies	239
Future Uses	244
Collaboration and Blended eLearning.....	247
Synchronous Tools.....	250
Best Practices for Synchronous Sessions	252
Advanced Features of Synchronous Learning	256
RWD Adult Learning Model	260
Achieving Success with Blended Learning by Harvi Singh and Chris Reed, Centra Software.....	263
Conclusion	276
Chapter 11: Rapid Authoring and Delivery Tools	277
Overview	277
Info Pak Simulator (RWD Technologies)	278
DDI's OPAL™ (Online Performance and Learning)	281
Cisco AVVID—The Architecture for e-Business	286
Centra Knowledge Center and Composer	394
Centra Knowledge Composer for PowerPoint Enables Business Users to Author and Publish Interactive Knowledge Objects	303
Outstart, Inc.	306
Chapter 12: eBooks for eLearning.....	311
Overview	311
Current State of eBooks	311
The Open eBook Forum and XML Standard	313
Application to eLearning.....	314
Future Innovations in eBooks.....	315
Effect on eLearning	316
eBook Examples	316
Digital Rights Management (DRM).....	321

Electronic Learning.....	325
eBooks Application to eLearning—A Practical Example	329
Conclusion	330
Chapter 13: Wireless and Mobile Applications.....	331
Overview	331
Instructional Development Shifts	332
Technical Integration Shifts	332
User Interface Shifts	332
Learner Experience Shifts	333
Details of the Instructional Design Model for Wireless Performance Support	334
Details of the Instructional Design Process for Wireless.....	335
Case Study: 3Com [®] University Uses the Palm [™] for Mobile eLearning.....	339
Case Study: 360Sync Offered by RWD/Latitude 360.....	342
Conclusion	344
Chapter 14: Resources for Blended eLearning	345
Industry Analysts, Research Firms, Consortia, Standards Groups, Publications, and Major Informational Websites.....	345
Knowledge Management Consortium International (KMCI)	349
eLearning Information (ASTD’s Learning Circuits).....	351
EPSS Information	351

This page intentionally left blank

Foreword

At the turn of the millennium, *eLearning* was touted as the next killer application, a technology-based business solution heralded by John Chambers of Cisco and others that would be the key driver of corporate profits and a knowledge-based global economy. At the same time, eLearning was shown to have the inherent capability of delivering training programs—anytime, anywhere—to desktops or laptops in all reaches of the world that had Internet access. That eLearning might, almost as a by-product, significantly reduce travel and other indirect costs associated with training seemed mere icing on the cake. Thus, the real value-add of eLearning programs at large companies was that they could train and thereby enhance the competency of large numbers of employees who could, in turn, improve products, services, and overall productivity. So, have eLearning systems reached anywhere near this kind of potential?

The short answer is no, but things are moving in the right direction. At the present time, eLearning systems consist of several different software packages with components that were designed and produced by many smaller companies. These components typically include a learning management system, a learning content management system, collaboration software, virtual classroom software, a mobile learning solution, and testing or assessment software. Consequently, organizations that are purchasing these components have necessarily been heavily involved in the integration and customization of these disparate eLearning technologies.

In fact, putting together an eLearning system today is comparable to purchasing an automobile part-by-part for assembly at some later date. So it's not surprising to hear about the horror stories that companies have encountered with componentized eLearning systems that do not function properly.

These difficulties are a result of interoperability problems and unexpected component limitations in scalability or functionality. And for companies with Human Resources departments that use legacy systems, additional integration and data migration problems have arisen as eLearning systems are being required to incorporate employee training records into company employee files. These difficulties, among others, have raised serious concerns about the functionality of today's eLearning systems, as well as doubts about whether or not they will live up to their promised business potential.

Nonetheless, strategic eLearning investments are being made in what could be considered "best-in-breed" eLearning system components that can be fully integrated with other enterprise systems to satisfy the complex learning requirements of large organizations. These integrated eLearning systems will, of course, need to be upgraded in the future to include new training and learning technologies that are designed to work within established standards such as AICC and SCORM.

One way to avoid some of the guesswork associated with the initial installation, operation, and maintenance of an eLearning system is to install a hosted or ASP version as a pilot of a more comprehensive eLearning solution under consideration. Here, a hosting organization can provide the eLearning components and the necessary support staff for a specified period of time, typically one year. The company, in turn, pays a per-seat fee for trainees as payment for the pilot system. Then, based on the performance of the pilot, the company can decide on the final system design and the necessary resources to deploy a successful eLearning solution. In some cases, this type of eLearning hosting model can become a long-term solution for organizations that do not ultimately have the resources, or perhaps the business interest, to build and maintain their own eLearning systems infrastructure.

The primary formats for eLearning today are live, online, or synchronous instruction for many participants in a virtual classroom environment or, alternatively, asynchronous self-

paced training for individualized instruction. Such eLearning systems can, of course, be enhanced by conventional training methodologies that include meetings and seminars, instructor-led training that covers specialized topics, and structured on-the-job training. Thus, the term *Blended eLearning* is broad enough to include complementary methods and technologies used to supplement those included in eLearning systems today. And more often than not, this *Blending* will include performance support and knowledge management technologies as well.

With this kind of broad eLearning thinking as a backdrop, it is therefore appropriate that HRD Press is bringing out a new text that is devoted to this more comprehensive view of *Blended eLearning*. The authors, Drs. David Metcalf and Larry Bielawski, have a wealth of experience in university instructional programs as well as business and government programs associated with the training of personnel using emerging eLearning technologies. In this book, they have succeeded in producing a thorough and incisive description of the state of several technology segments that are currently being integrated into today's blended eLearning systems.

July 1, 2002

Robert W. Deutsch
Chairman and CEO
RWD Technologies®

This page intentionally left blank

Introduction

A Time for Blended eLearning

The topic of blended eLearning has been defined in a number of different ways within today's businesses and organizations. Most often, however, it simply means a blend of instructor-led training with some type of online learning activity, despite whatever the mix or "blend" might turn out to be. Yet such a definition does not add a lot of new meaning in the evolving eLearning context today, especially as this emerging area of eBusiness becomes more and more defined by ample variations of online learning approaches and web-based training activities. In fact, it is now even possible to describe a world of pure blended eLearning, where different online learning (OLL) delivery methods, such as asynchronous and synchronous course delivery, can be used to create effective training and development solutions that reflect a sophisticated blending of new eLearning technologies and alternative instructional design approaches.

What can complicate the matter even further—yet in a positive way—is the introduction of other learning-oriented systems and their accompanying technologies, such as electronic performance support systems (EPSS) tools and knowledge management (KM) systems or portals. Yet these complementary technology-based approaches—which are also directed at improving human performance—are very much part of the eLearning mix today, for it would be hard to distinguish where formal training interventions leave off and where performance support activities pick up, and surely both approaches fit squarely within the context of knowledge creation and transfer processes.

It is for this reason that in this book we have deliberately set out to define blended eLearning more broadly to not only include OLL, EPSS, and KM practices and systems but to demonstrate their many points of intersection within complementary web-based training and learning management approaches that are deemed “hot” in the marketplace today. We would even go further to argue that only those systems and approaches that embrace these three otherwise distinctive technology-driven solutions can begin to approach both the promise and the sophistication of online learning in what is becoming more and more a global training and employee development marketplace that is driven by performance objectives and return-on-investment (ROI) models.

Even though we acknowledge that eLearning as an emerging discipline has indeed come a long way in its short history, a much more fundamental shift we are currently seeing is the move away from believing that online learning by itself can somehow transform education or training in complex organizations. Successful businesses and organizations are starting to discover that an approach that integrates the best features of knowledge and performance management with other modes of eBusiness—such as virtual training seminars, collaboration portals, and eCoaching—often forms a powerful and winning combination that can support all training endeavors.

Similarly, online performance support tools do not solely belong to the business units themselves, nor should all knowledge management efforts be assigned to IT or MIS departments. In fact, this kind of unnecessary compartmentalization of knowledge management, performance improvement, and learning activities in distinctive departments—along with their attendant technologies—has allowed us to miss the tremendous opportunity of realizing significant increases in the quality, effectiveness, and reach of our emerging eLearning programs and their business advantage.

So, then, from a 40,000-foot view, how does the blended eLearning model contribute to the overall enterprise? From a business perspective, an integrative blended eLearning approach is one that is driven by performance objectives and business metrics, as depicted in the diagram below.



Courtesy of RWD Technologies®

Such a model affords a powerful and cost-effective continuous learning solution that combines the following elements:

- **Learning**—whether it is classroom, workplace, or web-based, and delivered in a “live,” just-in-time, or self-paced mode
- **Performance support**—whether it takes the form of job-specific, context-sensitive, or embedded systems that serve as job aides
- **Knowledge management**—whether it is manifest in expertise directories, lessons learned databases, best practices repositories, and communities of practice that all reflect and deliver knowledge to learners at a particular time of need

Most importantly, this kind of blended eLearning model has been developed from a clear understanding of the business objectives and how these can be translated into specific targets for human performance and learning, which are most often dependent upon two critical components: knowledge and skill.

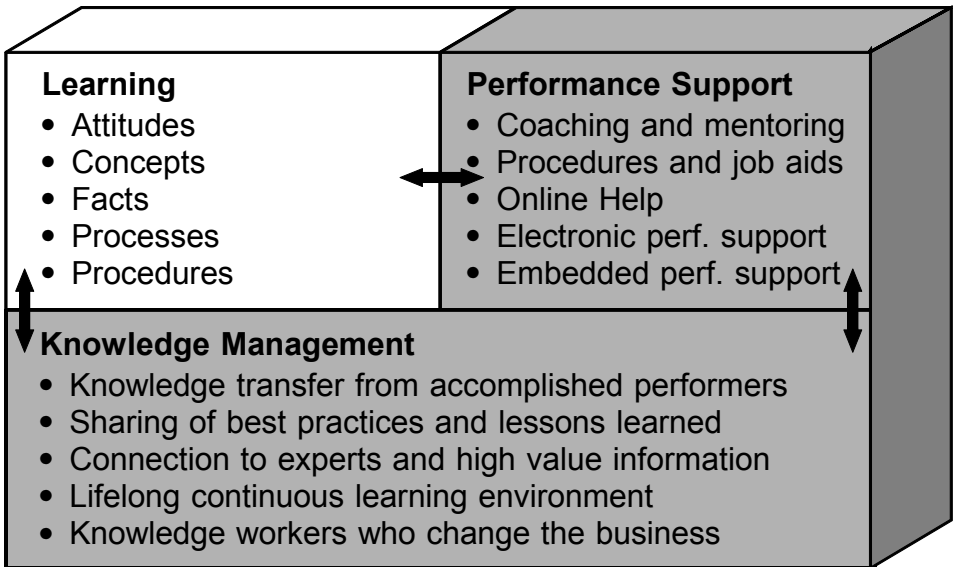
Hence, a combined learning, performance support, and knowledge management model acknowledges the fact that the basic categories of skill and knowledge can and often are imparted differently. As a result, the *blend* itself will focus on optimizing the mix of classroom instruction, online learning, and workplace performance support tools that can maximize the total impact on human performance.

Though such promises of performance and learning improvements are indeed large and sometimes suspect, it is only now with enterprise-class learning and content management systems coming into play that we can truly begin to talk about blended eLearning from the perspective of the learner, the manager, and the training administrator.

Put simply, the time for blended eLearning is now, and fortunately, there are a plethora of strategies, best practices, marketplace tools, and validated approaches to draw upon to begin building these types of systems and practices. No longer does eLearning need to be a somewhat siloed phenomenon or practice, typically associated with a forward-looking training department or instructional design team. In fact, this potential synergy—this convergence of people, processes, and technology across an enterprise—is the primary focus of this book: to demonstrate how a multidisciplinary approach to online learning and human capital development (HCD) can really make a difference and how the marketplace has finally given us the kinds of opportunities and technologies that can jump start the process.

Chapter 1

Scope and Applications of eLearning Systems*



As we acknowledged in the Introduction, online learning, or eLearning, has come a long way in its short history, even though we are seeing a movement away from believing that it can somehow transform training and education all by itself. Businesses and organizations are starting to discover an approach that integrates the best features of OLL, EPSS, and

*Sections of this chapter are reprinted from the special advertising sections of the May 15, 2000 issue of *Fortune* magazine.

KM with other means of sharing knowledge. But for many practicing online learners and instructors alike, this is really nothing new. In fact for years, some of the best approaches have integrated technology solutions with more traditional instructional delivery methods. But over the past few years, the Internet has given us many new options for blending our learning strategies, and it's now possible to deliver not only self-paced instruction over the web, but also rich-media simulations, virtual collaboration methods, real-time synchronous training sessions, online assessments and certifications, worldwide multimedia events, handheld performance support solutions, and computer-mediated online classrooms—all of which can extensively personalize the learning experience.

What's important to point out is that this new form of teaching and learning is largely not trying to imitate or replace the traditional world of classroom-based instruction; instead, it's using technology to transform not only the delivery mechanism of courses, but also their content and instructional methods in new and vibrant ways. In fact, eLearning is allowing companies to deliver “just-in-time” training to busy professionals who might have only an hour here and there in an otherwise hectic day to learn new things about the products and services their firm makes or for their own career development.

eLearning also allows technology-dependent workers, such as computing professionals, to keep up with the latest software applications by simply clicking and pointing at their desktop or laptop screens without having to wade through dense technical manuals or tedious classes that may or may not be relevant to their work or interests. Instead, they can learn at their own pace, whenever and wherever it's convenient—whether it be at home, on an airplane, or at the office. In addition, employees don't have to fly off to a conference or training event for three days, typically costing their employer huge amounts of money in travel and lodging as well as the opportunity cost of having the employees away from their posts for days at a time.

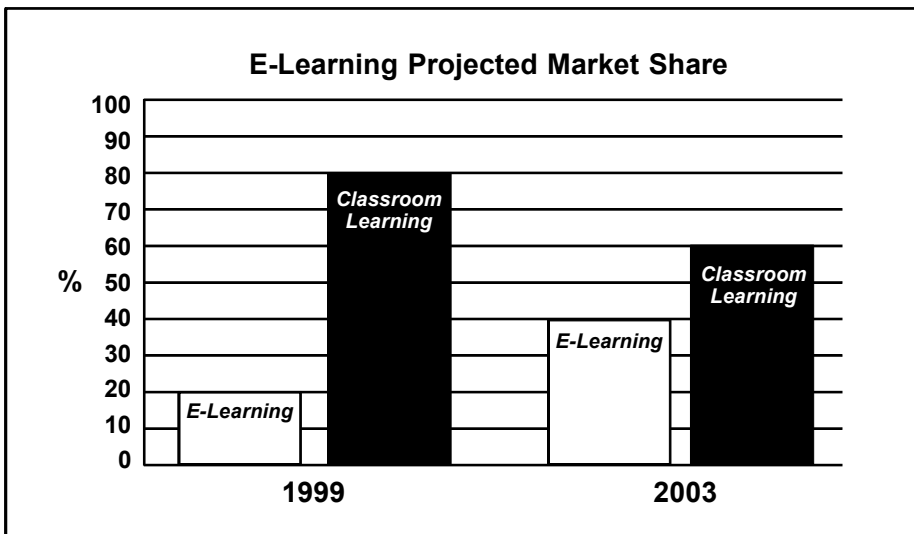
At the same time, online learning is also becoming increasingly fine tuned: it's leveraging the unique attributes of the Internet, such as interactivity, chat rooms, and online communities, and it's entertaining, making use of music, audio, animation, and even Hollywood-style cinematic experiences. Its proponents point out that those who participate in online learning retain as much, if not more cognitively than those who are taught in traditional classroom settings. And there are techniques now to manage corporate online learning systems, to assess students before and after they take the courses, and to calculate the ROI from such a venture.

The cost savings alone are compelling. Industry experts say that online learning costs on average about half as much as traditional classroom training. That doesn't even include the more intangible benefits, such as the opportunity cost of not having to send large numbers of employees away from their jobs at a physical training site for several days. Nor does it include the increased competitive advantages that companies derive from having a well-trained work force that's up-to-date on all the latest trends, collaborating with one another and sharing information throughout the company.

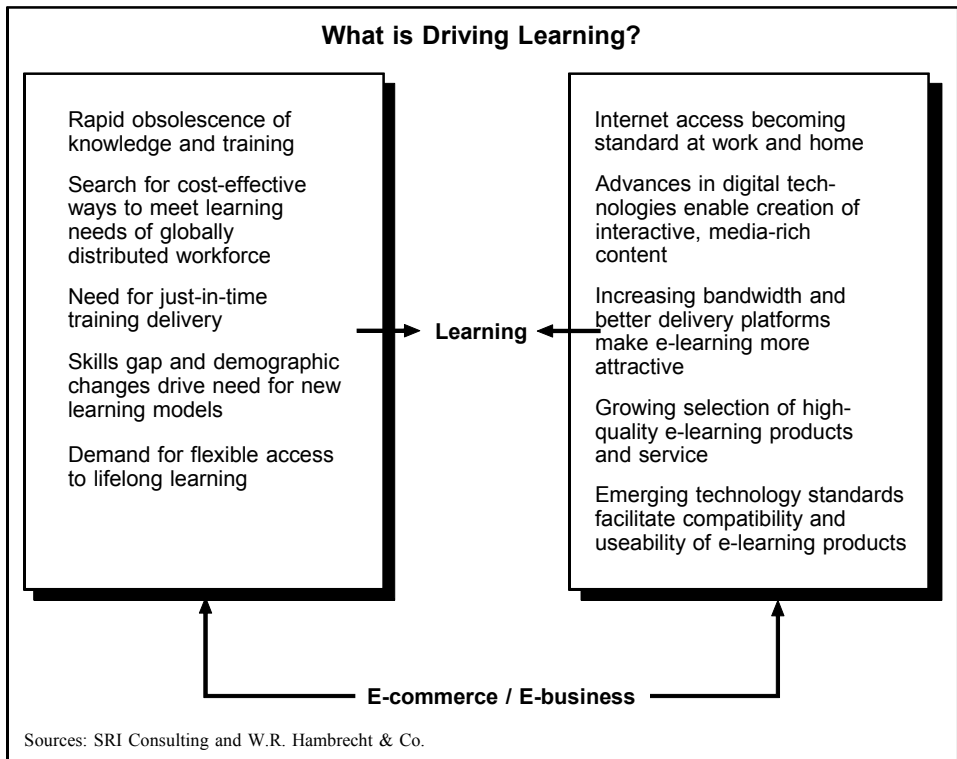
Today's web-savvy online learners cannot only access their interactive, multimedia studies from remote locations, but they can also build online communities, swapping questions and answers with their tutors and fellow students via e-mail and bulletin boards. Ultimately, online learning can make successful "knowledge management" possible—that is, using technology to leverage the intellectual capital of the entire company, which in turn leads to increased productivity, shorter time to market, and superior competitive advantage.

A Bullish Outlook for the eLearning Market

For some time now, online learning has been projected to boom. Corporations already spend \$66 billion a year on training, about 20 to 30 percent of which is spent on eLearning, and 70 to 80 percent on traditional classroom instruction. However, the Corporate University eXchange (CUX), a New York City-based organization, says that by 2003, this figure is expected to shift to 40 percent for online learning and 60 percent for traditional classroom instruction as corporations increasingly embrace the new learning technologies (see chart below).



“While the market is currently relatively small and in an early stage, it is poised to explode,” writes Cornelia Weggen, former research analyst at the investment firm of W. R. Hambrecht & Co. and now at ThinkEquity. In fact, Weggen has written a report about the industry entitled “Corporate E-Learning: Exploring a New Frontier,” which can be viewed online at the firm’s web-site: www.wrhambrecht.com. In the report, Weggen notes several major factors that are driving the growth in online learning (see graphic on the next page).



First, the U.S. economy is evolving into a knowledge-based economy, which in Weggen's words "puts a premium on intellectual capital." In this setting, lifelong learning is not just a buzzword: it's "an imperative." Second, a paradigm shift is taking place in the way education is viewed and delivered. Business success "depends more and more on high-quality employee performance, which in turn requires high-quality training," Weggen says. And third, there are huge knowledge gaps in the education system that demand reform. Weggen notes that U.S. students lag behind students from other industrialized nations in crucial areas such as mathematics and science. And according to the U.S. Department of Labor, more than 40 percent of the U.S. labor force performs at the two lowest levels on government literacy scales. Warns the Hambrecht report:

“The chasm between the higher demands of a knowledge economy and the educational status of the workforce is deep and must be addressed if the U.S. is to remain competitive internationally.” Thus, corporations will compete fiercely with one another for skilled workers, especially in times of low unemployment rates. According to Pricewaterhouse-Coopers, 70 percent of the world’s 1,000 top-tier companies cite lack of trained employees as their number one barrier to sustaining growth.

Nonetheless, more than one-third of U.S. higher education institutions offer online courses—including Harvard, Berkeley, Stanford, and NYU—and some are moving to offer full accredited degrees on the web, too, in a full array of subjects. The academic sector—in and of itself—will be a huge market for this industry. In the United States, the education and training sector is second only to health care as a percentage of gross national product. The total education market is a whopping \$772 billion in the United States, or 9 percent of GNP.

Worldwide, the education market is currently worth \$2.1 trillion, according to W. R. Hambrecht & Co. The potential for online learning around the world is vast, according to many industry leaders. Consider this scenario envisioned by Larry Ellison, CEO of Oracle, speaking before the 1998 World Congress on Information Technology in Fairfax, Virginia: “One day, a man in rural China will be able to get a master’s degree from MIT online, then start a business in cyberspace—all without leaving his village.”

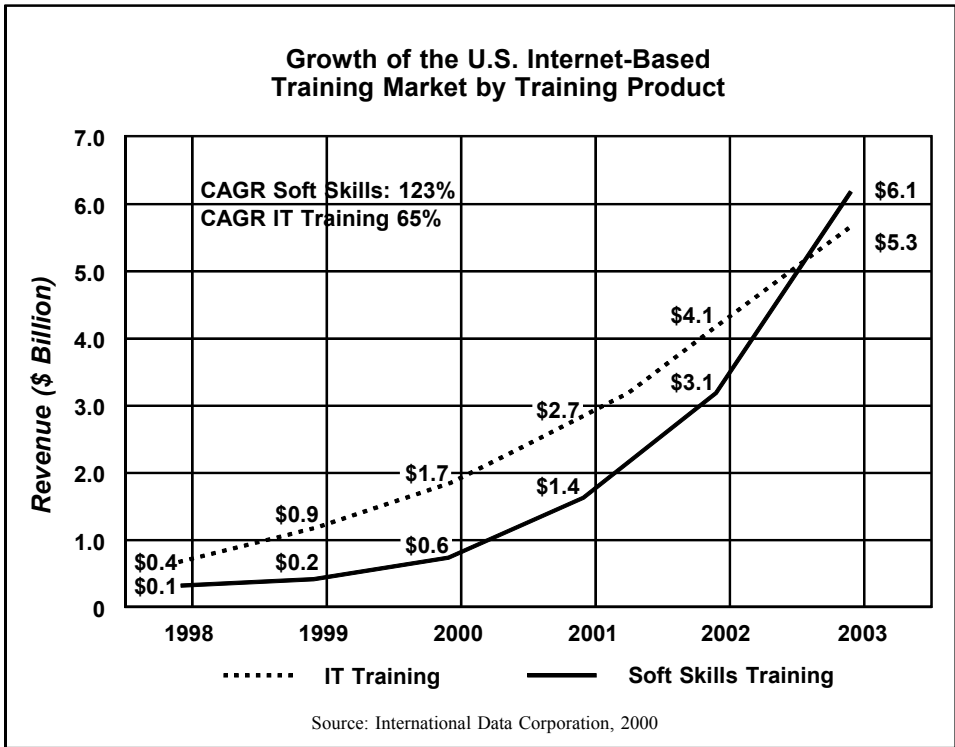
Quite apart from these futuristic scenarios, there are concrete, real-world examples of online learning being used around the globe. Elliott Masie, president of a think tank called The MASIE Center and guru in the learning field for almost three decades, travels the world conducting seminars about the revolution in technology and learning. Recently, he was in Abu Dhabi, the capital of the United Arab Emirates and a center of information technology training in the Middle East, where he

gave the keynote address at the first Middle East Workforce and Human Resources Conference. Reports Masie: “Online learning and distance learning is seen as a must-have for them to take a leadership role in the region. There was no need to build the case for IT training in their country. They ‘get it’ and are using skill development as a national strategy.”

Former Gartner Group analyst Clark Aldrich is predicting that the online learning business could soar from its current \$1.5 billion level annually to at least \$22 billion by 2003. “There’s no ‘inherent’ limit to the market size of this industry,” he says. “There is such a capacity to absorb good courses—not just from corporations, but from other groups, including the elderly, high school students, not to mention the vast populations of countries such as India and China.”

Other industry sources also predict high growth in the industry, albeit at a somewhat more restrained pace than Aldrich’s forecast. Nevertheless, the numbers are still huge. Cushing Anderson, program manager for learning services at IDC, an industry research firm, predicts that the U.S. corporate market for eLearning will exceed \$11 billion by 2003, representing a compound annual growth rate of 83 percent from 1998 to 2003. “While e-learning still faces some obstacles, vendors without an e-learning strategy will lose share to their competitors,” writes Anderson in his recent forecast for the market. By way of definition, IDC defines eLearning as the asynchronous or synchronous (real-time) delivery of training and education over the Internet to an end-user’s computer.

Anderson also predicts that in 2003 the non-IT learning share of the market will surpass IT eLearning for the first time (see chart on the following page). Well beyond simply teaching people computer skills, online learning is evolving to include a whole array of subjects, including what are known as “soft skills” at corporations. This includes course work in such areas as business writing and communication, or how to invest funds contributed by your company’s retirement plan.



Three Major Market Segments of the Industry

The online learning industry has three major market segments, according to IDC. First are “content” organizations, consisting of firms that furnish course structure, multimedia (graphics, video, sound, and animation), simulations, testing, and assessments. This includes both off-the-shelf as well as specially developed, customized applications.

Second are “learning services” firms, which provide needs assessments, program-building components—content design, development and programming, technical and systems integration, site management and hosting, maintenance, and online mentoring.

Third are “delivery solutions” companies, which sell technologies associated with eLearning, including training,

authoring tools, course management systems, collaborative software and virtual classrooms, and add-on tools. The delivery solutions category does not include hardware and network infrastructure, such as routers and firewalls.

Cushing Anderson at IDC predicts that “content will be king and will garner the greatest share of the market” during the next five years. Learning services will be the fastest-growing sector of the eLearning industry, in his view. Furthermore, his forecast says that delivery solutions will account for a less significant portion of the market over time, “as customers shift toward increased spending on content and services, such as course development, administration, and maintenance.”

He continues: “Tools will become a commodity as the industry consolidates around particular authoring, management systems, and synchronous learning solutions. In addition, we anticipate these tools to be embedded within end-to-end eLearning solutions. Obstacles to eLearning market opportunities will become less formidable in the near term. Specifically, Y2K time and budget constraints will subside in 2000, vendors will continue to enhance their course offerings in digestible ‘chunks’—called ‘chunking’—for more interactivity, and more content will be converted to or originate in Internet-ready formats.”

Anderson’s study, entitled “IDC’s Fifth Annual U.S. Training and Education Industry Survey, 1999,” utilized material from interviews with over 200 corporate purchasers of training and more than 40 providers of training content, learning services, or delivery solutions.

Where is the eLearning Market Today?

In 2001, U.S. organizations spent more than \$66 billion on formal training, a figure that was almost 25 percent higher than just seven years earlier. IDC estimates that approximately \$17 billion was spent on outsourced services, content, and technology for training, a figure that is predicted to grow to

over \$33 billion by 2004. Today, the vast majority of these expenditures are made on traditional training products and services like printed materials and instructor-led classes, while spending on eLearning totaled less than \$500 million. By 2003, however, IDC has forecasted that eLearning expenditures will reach more than \$11 billion. Clearly, a shift is taking place in the way companies are delivering learning opportunities to their employees, partners, and customers.

Today the eLearning industry is still in its infancy.

Certainly we have seen technology begin to pop up in the world of training in recent years. However, early manifestations of eLearning have looked a lot like traditional learning slapped on a web-site and decorated with a few bells and whistles. It is only in the past year or so that eLearning vendors have been delivering more sophisticated content and technologies that truly take advantage of all of the web's various capabilities. While bandwidth limitations still hamper the widespread use of some of the more intense multimedia applications, the growing base of subscribers to broadband Internet access is alleviating this problem and creating more demand for interactive content that goes beyond the boring "read-and-click-to-next-page" model of web-based learning. Today, eLearning can incorporate everything from simple text to complex simulations and streaming media. While such applications might not be necessary in all cases, the variety of ways in which material can be presented on the web makes it possible to cater to learners with many different learning styles.

A Market Whose Time Has Come

Industry expert Brandon Hall of brandon-hall.com suggests that the eLearning market, while hyped, is producing real learning and business results. "As learning moves closer to the job, blended instruction addresses the need for more just-in-time and project-based learning, performance support, open and distance learning, expert assistance and a generally greater variety

of events and experiences. The emerging e-learning model blends online learning for information transfer and procedural skill training, classroom learning for role plays and face-to-face discussions, and on-the-job learning, integrated with knowledge management and competency evaluation.”

Nathaniel Palmer of the Delphi Group has some additional thoughts on the rise of new partnerships between the corporate world and academia. “The lines are blurring between traditional neutral delivery vehicles and those that have a stake in what’s being delivered,” he says. Thus, many major universities will begin striking partnerships with corporations to create content in what he refers to as “New Age co-opetition.” One example: Top academic institutions could sell their high-end, branded courses to corporate universities. In summary, eLearning adds a whole new dimension to education—an ancient human endeavor. It promises to create engaging courses, accessible instantaneously anywhere in the world, at an affordable price. John Chambers, president and CEO of Cisco Systems, put it best. As he wrote in a *New York Times* op-ed piece on November 17, 1999: “The next big killer application for the Internet is going to be education. Education over the Internet is going to be so big, it is going to make e-mail usage look like a rounding error.”

Learning portals allow people to gain access to all of an organization’s online training information and other resources from one central site. Because of their ease of use, they have become an increasingly popular resource; there has been a tremendous surge of rollouts for learning portal sites. The term *portal* has become a bit overused, but it is still a valid approach for accessing learning in an employee self-service (ESS) model. Each portal has a different definition of learning and training management. Here are some tips and definitions for distinguishing the difference between the vast numbers of sites to visit, as discussed by industry expert Elliott Masie:

- **Portal.** Any site that offers a learner or an organization a consolidated access to learning and training resources. A portal can range from a simple page filled with links to a sophisticated virtual classroom and learning center. If the site defines itself as a single source for learning, it is a portal.
- **Content consolidation portal.** A good number of portals are aiming at the content consolidation and aggregation business. These portals offer the learner or buyer a simple way to shop for all of their training needs on a single page. This means a wide selection of offerings from a multitude of vendors. The portal benefits financially by claiming a percentage of the sales generated from the vendor. Some are “treating” the content so that it can be used interchangeably, mixing and matching training modules from several vendors.
- **Embedded technology portal.** These groups are using the portal as a way of embedding and selling their technology as a component of learning or on a LSP (learning service provider) basis. For example, after a single class is purchased, all related support information regarding training can be accessed. Or, the portal supplies a free or usage-based access to a virtual classroom with digit collaboration tools. These portals are selling technology more than content.
- **Internal portal.** Why go to the Internet if you can have a portal built to your specifications? A customized portal is located on the internal server and offers content consolidation and/or embedded technology. This strategy enables a learning site to be built rapidly. It also offers secure access because it does not require a connection to the Internet.

- **Community and collaboration portals.** These portals focus on building a digital community of users and are recognized by the presence of standard community technologies like chat rooms, new information on learning, discussions, and links to books to buy. We know that learning is a social experience, so it is anticipated that community portals will proliferate in the coming months.
- **Affiliation portals.** These portals, similar to community and collaboration portals described above, are primarily for nonprofit organizations. They evaluate products and offer their version of a “Good Housekeeping seal of approval,” allow content screening, and in some cases, discounts on purchases.

Keeping up with new information and knowing how to use it are “mission critical” activities to businesses and individuals alike in a market in which competition is no longer characterized by “the big beating up the small,” but rather by “the fast running past the slow.” If you were to define training as giving people the information and skills needed to compete effectively in the marketplace, many traditional training methods (e.g., classroom-based lectures, manuals) are anachronisms in today’s fast-paced, information-driven economy. With that in mind, enterprises that wish to maintain a competitive workforce are beginning to make room in their training programs for a new form of preparing individuals to be productive and thrive in today’s society. The growing use of networked technology to deliver training to workers has spawned an entirely new industry—one that has come to be called eLearning.

Uses That Go Far Beyond Training

Ultimately, this new approach to learning will have ramifications that extend far beyond the traditional spheres of training and development at corporations. It will become a tool for

e-commerce, as well as a strategic weapon, enabling companies to hone their competitive edge and engage in knowledge management. They will be able to use technology to leverage the intellectual capital of the organization, which is the most important asset in today's economy. As Shanti Mittra puts it, "The well-trained employee has transcended brand, technology, and even corporate equipment as the most valuable corporate asset. Training is the key to maintaining that."

Merrill Lynch, in an April 1999 report entitled "The Book of Knowledge," echoed the view that knowledge workers bolster a company's bottom line—a fact that's even reflected in a company's share price. The report was written by a team led by Michael Moe, director of global growth research at Merrill Lynch.

The team compares how companies' share prices are valued in the old economy versus the new one. The authors compared valuations of the 10 largest companies in the old economy, with that of the 10 largest companies in the new. "Those companies that have created growth by leveraging their 'off balance sheet' human capital assets have, in turn, seen their share prices rewarded with higher valuations," write the authors. They conclude that in the "old" economy, price-to-book was a useful valuation measure because it represents physical capital that companies leveraged into earnings power. In 1980, the price-to-book of the largest companies in the United States was 1.2x. Today, the price-to-book is 12.3x or 10 times greater. "Given the intangible nature of human capital, it simply cannot be 'line-itemized' on a balance sheet, as with tangible assets," they write. "We believe rising price-to-book ratios reflect, in large part, the fact that the productive assets driving growth are increasingly 'off balance sheet' assets."

Improved training will, therefore, have a positive ripple effect throughout a company, enhancing its productivity and ultimately its overall value. Furthermore, the widening gamut of online courses can be used to hone the skills of employees on

any rung of the corporate ladder. So, while lower-level employees might be studying things like how to use PowerPoint presentations in their eLearning seminar, the higher-level managers will be able to simulate critical business situations and role-play their decision-making online—whether it be deciding on a major acquisition, spinning off a division, or going public—without any adverse consequences. They'll be able to see how the results of these decisions play out in a simulated setting—a “virtual experience”—and, in so doing, groom themselves for the CEO slot.

Online learning can also be a powerful tool in eCommerce. It can be used as a way of educating your customers, and hence inducing them to buy your product. By way of example, the Gartner Group cites the web-site of Charles Schwab & Co., Inc., one of the nation's leading brokerage firms. People can log on to the web-site and take free, online investing courses. This, in turn, might spur them to become customers of Schwab. Or, notes Gartner Group analysts, a company with a complex product to sell—say, a sophisticated type of camera—could offer free, online courses at its web-site teaching people the proper way to take pictures with the camera. “And what if you could learn how to use the camera before you bought it?” asks Gartner Group analysts. Such a feature could spur sales, potentially from new and unexpected quarters.

“Not just training your customers, but training your prospective customers is awfully important,” say Gartner Group analysts. And, with the power of the Internet, you can reach potential customers all over the world. Used in this way, online learning is no longer an expense at a firm; rather, it becomes a profit center.

Training—seen in this broad light—then becomes cost-effective in its own right. “It's worth it to develop an organizational capability in e-learning,” says Gartner. “It increases the organizational capacity to learn, and it will become a business imperative.”

What Do Online Learners Think about Their Experience?

Because online training is a relatively new field, there's not a lot of data available about what online learners actually think of the experience. So the Corporate University eXchange (CUX) has set out to find some answers. The organization created a database of 10,000 eLearners, culled from FORTUNE 500® companies, who are currently taking or have recently completed online courses from a variety of sources. CUX is in the process of surveying these individuals and plans to publish the results of the survey entitled "Learning in the Dot-Com World: E-Learners Speak Out" later this year.

The results will shed light on some areas of keen interest to corporations. Among them: how to avoid "churn," or the problem of paying for courses that employees won't use. "We're trying to understand the impediments to people not finishing online coursework," says Jeanne Meister. "It says something about instructional design."

CUX already has some preliminary findings from about 200 respondents. For instance, many of these respondents said that if they had a choice between a two-hour online session and a two-hour classroom session covering the same topic, they would prefer the online session. While most eLearners participated in their course from their desk at work, nearly two-thirds indicated that they would have preferred to learn from home. And eLearning—contrary to some people's beliefs—was not a solitary pursuit. eLearners interacted with each other both through face-to-face meetings and on the telephone, according to CUX. Plus, almost half of the eLearners said they invited a friend over to take an online course with them.

Meanwhile, Internet-based training got a big thumbs-up from participants in a survey conducted by IDC. Almost all those polled said they would recommend Internet-based training, and 60 percent said they would recommend it highly.

Those surveyed included training managers, information system managers, and business unit managers.

According to IDC analyst Ellen Julian, three factors contribute to the success of Internet-based training programs: “flexibility, convenience, and cost-effectiveness.” The survey also found that lack of desktop access keeps some companies from trying Internet-based training.

Why eLearning?

A lot of lip service is paid to the “anytime, anywhere” aspects of eLearning, but the true power of eLearning is likely to be found in its potential to provide the right information to the right people at the right times and places. eLearning is often a more effective and efficient way to educate workers because it is:

- **Personalized:** eLearning allows entire programs of study to be customized for a company, a department, or even an individual learner.
- **Interactive:** eLearning can truly engage the learner in a give-and-take type of learning that involves simulations of real-world events and sophisticated collaborations with other learners and an instructor.
- **Just-in-time:** eLearning moves training away from the “just-in-case” model in which learners engage in event-based sessions that require learning to take place outside the context in which it will be used.
- **Current:** eLearning allows training providers to always offer learners up-to-date materials.
- **User-centric:** eLearning focuses primarily on the needs of the learner, instead of on the abilities of the instructor.

What's more, eLearning more effectively meets the needs of the 21st century enterprise, which often has workers spread out all over the globe, is working at a much faster pace than it was even five years ago, and depends on having the most current information in order to survive. For companies that fit this description, relying solely on traditional training methods simply won't cut it anymore—eLearning is a necessity.

Who's Selling eLearning?

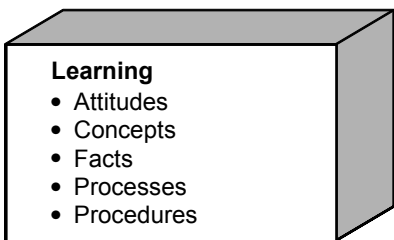
Considering eLearning is a fairly new concept, it might surprise you to know that there are literally hundreds of companies peddling eLearning products and services. To make it simpler to understand, you can try breaking this enormous and fragmented market into three categories: technology providers, service providers, and content providers. Of course, many technology companies also offer complementary services, and some content providers sell technology elements as well. Then there are the companies that are mainly service providers but also act as distributors of content and technology. (Okay, so maybe that categorization method wasn't so simple after all.)

The truth is that using any one of the above characterizations alone often leaves vast holes in the picture of almost any company within the eLearning market. To make things even more confusing, whatever categorization method you use today is likely to be invalid in the near future because, as in any developing industry, business models and product offerings are continually (and quickly) evolving. As companies seek to define their territory, many are trying to stake out fairly large areas in the marketplace by claiming to offer everything that everybody needs. To a large extent, the many vendors that claim to be "one-stop shops" for all eLearning needs are simply perplexing their target audience and causing hesitancy on the part of purchasers. This book is just the beginning of an ongoing dialog about blended eLearning, and we encourage our readers to visit the companion web-site for related information.

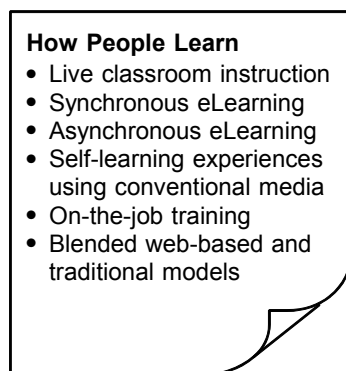
Where to Turn Next?

So, you have been assigned the task of choosing and implementing a successful eLearning strategy. You might be asking yourself “Where do I start? Technology? Services? Content?” Having reviewed the options, it is time to face the fact that this is not an easy or precise sport. Deploying effective eLearning programs may require products and services supplied by a variety of vendors—leaving you to connect the dots. For example, you might be wondering whether you should execute an approach that places all the eLearning components online at once or if you should simply plan to execute the new strategy in phases over time. Since there are no absolutes when designing a successful eLearning strategy, this book is intended to provide some guidance as to which questions should be asked and answered before proceeding to vendor selection. How you answer some of these questions will ultimately determine which type of eLearning solution is right for your company. The benefit will be a smooth and fruitful vendor selection process.

The First Building Block



People have basic learning needs in any organization



Categories of eLearning

To fully appreciate the potential impact of eLearning and to begin to sort through the confusion, we must also understand the forms eLearning can take and how these affect learning. To affect attitudes, concepts, facts, processes, and procedures, a variety of learning interventions are used. Anyone who has had any formal education has surely encountered techniques such as classroom, instructor-led training; mentoring; and tutoring by caring teachers and trainers. What we are proposing throughout this book is not a replacement of these tried-and-true methods, but rather an expansive augmentation of them. Since most people will be familiar with these methods, we'll save further details about these learning interventions, or methods, until we begin to discuss the decision structure of blended eLearning in the tools section. Let's move on to explore some of the newer techniques that have not been experienced by as wide an audience at this point.

Facilitated Synchronous

Facilitated synchronous is a somewhat academic term frequently used to describe live training online—real-time interaction between an instructor/facilitator and remote students. For example, a sales training session could be conducted over several hours. Presentation files could be displayed to reinforce key points, audio could be delivered over a teleconference call or over the Internet, and web tours and application sharing could take place. Additionally, the real benefit of this method is the two-way interaction that can occur in real-time with students responding to information and asking questions or answering survey/poll questions. This format most closely mirrors the familiar classroom format and is often an easy transition to first steps from more traditional methods into online learning.

Facilitated Asynchronous

Asynchronous denotes time-shifted. Instruction is just-in-time, when you need it. This model is typically followed by educational tools used in distance education and training where there is an instructor to guide, but timing is an issue. In an online classroom, instructors and students correspond via e-mail and discussion boards while following a set curriculum that students can complete at their own pace. Assistance is available and this separates this learning intervention from a fully self-paced instructional module like those discussed next.

Self-Paced CBT/WBT

Computer-based training (CBT) has been with us since the 1960s, but increasing power and multimedia capability have brought it to a new state-of-the-art level. Unfortunately, we've had to take a few steps back in both instructional treatment and use of advanced media with the advent of the web for delivery. Web-based training (WBT) is just now beginning to catch up to CD-ROM and computer-based delivery methods as broadband capabilities become a reality. CBT and WBT share similar characteristics of following a very logical instructional design paradigm that packages most of the instructional elements as well as the content to be learned into a self-contained, learner-controlled environment. Learners can go through the information at their own pace, pick out the parts that they need, and usually go back later to the learning material to refresh. The repeatability and consistency of the format have advantages for online practice/simulation and ensuring instructional consistency.

Collaboration

The broad category of collaboration begins to combine various formats from above, with some of the modern techniques for sharing information among peers and colleagues. For example, online chat functions are being added to CBT/WBT to produce a richer result that feels like having a personal tutor to turn to if

you get “stuck” in the self-paced environment. Additionally, discussion boards, peer-to-peer networks for digital content exchange, and of course, e-mail are all being used to promote information sharing and online assistance.

In addition to these common online learning techniques, we’ll be exploring a variety of other learning interventions and the combination of those throughout the book. Next, let’s examine a new spin on an age-old principle of mixing learning methods within the classroom environment, in this case with the addition of electronic media.

Digital Surrounds

One relatively new area of eLearning technology support for instructor-led training (ILT) is the use of Digital Surrounds, a term coined by Elliot Masie and used to describe rich media technologies that support and enhance traditional classroom-based instruction. According to Masie in a survey on the use of Digital Surrounds, the addition of eLearning components to traditional instructor-led, classroom-based training experiences can enhance the offering by adding technology before, during, and after in-person meetings. Here is a summary of how Digital Surrounds are most often used:

- E-mail access to instructors—post class (67 percent)
- Links and resources to Internet—(57 percent)
- Online pre-work (39 percent)
- Online assessment and testing (38 percent)
- Online courseware and textbooks (38 percent)
- Frequently asked questions (FAQ) listings (28 percent)
- Virtual classroom or chat room scheduled (18 percent)
- Digital field trips in class (165 percent)
- Media streaming of classes (11 percent)

In each of these categories, the 1,360 respondents Masie interviewed reported significant planned growth of Digital Surrounds. But alarmingly, when he asked respondents about

trainer readiness and acceptance of integrating technology and training, 62 percent felt some of their trainers were skeptical or resistant to integrating technology and training.

The Overall Objective

Live eLearning has become a hot topic. In late 1999, Cisco's John Chambers brought attention to eLearning by calling it the next "killer app." As the economy has transitioned into one where knowledge is the supreme competitive advantage, educated work forces and customer bases have evolved into the definitive means of achieving market domination.

But how do companies educate people quickly and cost-effectively in order to reach such lofty goals? Many companies are turning to the Internet as the all-around salvation for corporate training and education. And why not? The Internet is an informal learning channel when you consider that it is used primarily as a means of communicating, disseminating, or sharing information. The issue with the World Wide Web as an eLearning system was that it did not allow for instantaneous feedback or interaction. Further, the web was an unreliable communications vehicle, which proved the need for less painful interactive experiences. Since learning is inherently a social activity, many considered that there had to be a more effective way to educate.

eLearning was born out of the need to leverage the Internet's natural facility for timely communication. Many pioneers in the field considered the Internet to be a solid foundation on which to build. Thus, eLearning has become a way to address learning experiences that run the gamut from ad hoc meetings to ongoing communities of practice. But what factors do you need to take into account when establishing an eLearning strategy for your company?

The first thing to consider when looking at different eLearning solutions is the purpose of the system. How does your company propagate learning? Is it a formal activity that takes

place in a structured environment or is it more informal, such as a weekly meeting to exchange information? Does your company have an ongoing forum for educating customers and employees, or is learning an ad hoc event that may or may not occur at any given time? Does your company view eLearning as a profit center or simply a cost of doing business? By reinforcing educational practices currently in use and reaching beyond the learning options your company offers today, the outcome will be a robust solution that will have the power and flexibility to expand with your company as it grows.

Content Is Queen, Context Is King

In the end, you want a vehicle through which you can train large numbers of people in a timely and cost-effective manner. The first consideration has to be content. What do you need to communicate? What do people in your organization need to learn in order to be successful? What do your customers need to know to achieve maximum success with your products or services?

These basic questions beg yet more inquiries. The most critical issues you must consider in relation to training content are content sources and content quality. These are important for two reasons: you may have to buy content from someone else (i.e., off-the-shelf) and/or you may need to harvest internal expertise (i.e., custom content). But what does this really mean to you?

If you are interested in sharing valuable knowledge with an audience, you may simply purchase the content, modify it to suit your purposes, and teach it. This requires only that you have some idea of your desired outcome and that you know where to go to get the content of interest.

If, however, you want to harvest the expertise or experience base of some or many of your internal knowledge experts, then you have different challenges. You must first design a method of gathering the information of value to your audience. This might involve exhaustive interviews that you tape or record in some

fashion. It might entail surveying many of the experts from whom you desire information. It might simply rely on informal communications among the “counsel of advisors” you select.

But there is an easier way to lure such information from internal experts—simply choose an eLearning platform that is designed to quickly and easily draw out content or valuable information that you intend to use.

Technology: How to Flip the Switch Smoothly

Now you have the content or you have selected the process for procuring the content. Next you must figure out what type of technology makes sense for your environment. There are three key questions to ask yourself at this point in your planning:

- Am I building an infrastructure to support a profitable business around eLearning?
- What is the delivery vehicle for my content?
- How will I manage the content, the classes, and individual education plans?

When it comes to infrastructure, many professionals start a slow burn that evolves into the shakes and sweats. Infrastructure means change to the existing technological architecture, which can be the precursor to problems on a grand scale.

Fortunately, today there are many software technologies that act as infrastructure without the implementation nightmares commonly associated with such rollouts. The key here is to ensure that your eLearning infrastructure is flexible enough to evolve with your company as your needs change.

Usually, the best decision is one that relies on innovation and experience. Who is the leading innovator in the space and who has had experience implementing large-scale projects on a worldwide scale? Can the technology handle firewalls effectively? Can it handle your firewall effectively?

The eLearning delivery vehicle is the most visible choice of your eLearning strategy. This is where people assess your success or failure. Does it work or doesn't it? How smoothly does the new system work? If you are building the framework for a new profit center, then the new eLearning delivery platform needs to address certain additional requirements. Issues such as digital rights management, billing, and branding all become more significant when the technology is the conduit for revenue.

The next consideration revolves around eLearning management. Once you have envisioned the best eLearning strategy for your company, how do you manage the many classes or channels offered? How do you effectively plan for and manage the individual learning plans for each professional in your extended organization? How do you account for learning plans that include a number of different learning options such as live eLearning, recorded content, physical classroom experiences, etc.? Ultimately, a blended learning plan that includes a number of different options will be best administered by a learning management system (LMS). Vendors that offer LMS options can outline the many benefits of using an LMS and how to incorporate such a system into an eLearning implementation.

The last and most significant question in the area of technologies has to involve support. What kind of support do you need? The answer really goes back to your original objective. Are you augmenting an existing internal education program or are you establishing a new profit center for your company? In the case of the latter, you will demand a higher-level support for your customers who might be paying as much as \$200 for every virtual seat in your classes. In this circumstance, you may desire online class monitoring where an experienced individual attends your class as a fail-safe in the event that there is a technical issue or an unexpected personal problem for the instructor.

Going Beyond Today's Blended Learning Model

As stated in the Introduction, the most common form of blended learning found in corporate workplaces today is a combination of instructor-led training and one or more forms of online learning. In fact, with the events of September 11, 2001, as a backdrop to reductions in travel associated with corporate training, more often the preferred blended learning solution is some type of synchronous web-based activity with a minimum of classroom-based events that absolutely require this mode of delivery. However, we have found that blended learning can be much richer than simply moving the classroom online or taking advantage of the latest advances in e-meeting technology and virtual learning environments. In such cases, this richer eLearning will also take the form of self-paced asynchronous courseware, and we suspect that more content of higher quality will be developed over the next several years to meet these growing needs. But we also wanted to lay the foundation for the most essential component of blended eLearning solutions that take advantage of electronic performance support systems and knowledge management practices.

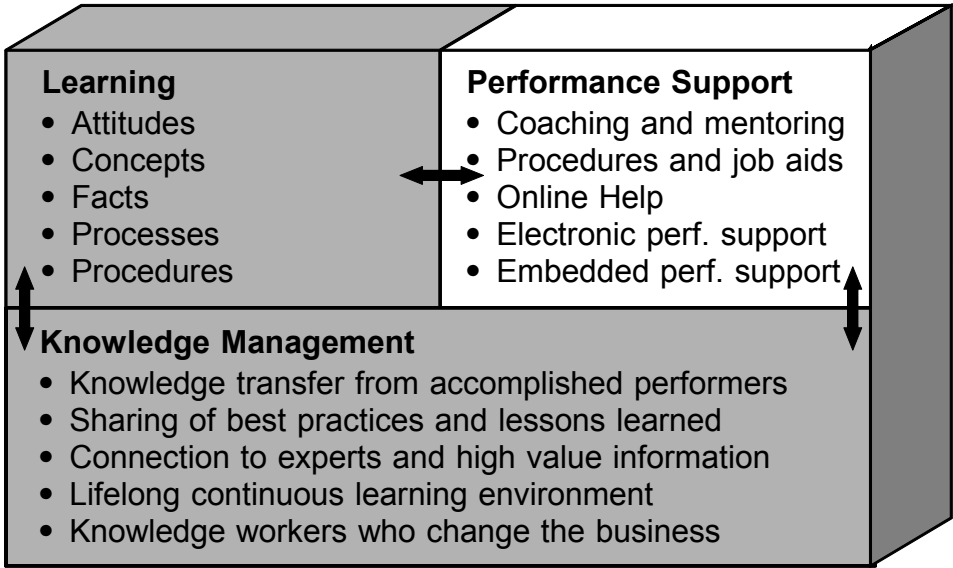
So in this chapter we have provided you with a brief overview of the market promise of eLearning, expert views on the topic, and a description of the various methods that have given shape to contemporary training and development approaches that rely on new technologies. Hopefully this has broadened your view of what online learning is and how it might be put to use in organizations that have this broader view. For more details on the evolving topic of eLearning, please consult the book's web-site for new information in this fast moving area at:

<http://www.blended-elearning.com>

This page intentionally left blank

Chapter 2

Performance Support Tools



It would be impossible to talk about electronic performance support systems (EPSSs) without considerable attribution to Gloria Gery's pioneering work in the field. Gery has defined EPSS as "an integrated electronic environment that is available to and easily accessible by each employee and is structured to provide immediate, individualized on-line access to the full range of information, software, guidance, advice and assistance, data, images, tools, and assessment and monitoring systems to permit job performance with minimal support and intervention by others." A simpler definition, however, might be that an

EPSS is nothing more than a tool that can improve human performance by reducing the complexity or number of steps required to perform a task; by providing the performance knowledge an employee needs to perform a particular task; or by providing a decision support aid that enables people to take action, to solve problems, or to push forward the boundaries of past accomplishment.

Although more recent definitions of EPSS have expanded upon Gery's original work, they still primarily focus on providing whatever is necessary to generate performance and learning at the moment of need. This concept of performance support at the exact point of need is now a common theme of all on-the-job performance support systems today and is critical to reducing both time-to-understanding and time-to-competency in task-oriented performance.

According to Gery, three factors contributed to the development and deployment of electronic performance support systems as we know them today:

- The rapid development and implementation of information technologies.
- The increasing complexity of the workplace, including the exploding amount of technical information required to perform complex tasks.
- The need for increased performance and competency to enable individuals and organizations to become more competitive, especially in times of fiscal constraint.

Thus, an EPSS can dramatically help organizations reduce the overall cost of formal training while increasing productivity and performance at the same time. Often, an EPSS will empower employees to perform tasks with a minimum amount of training or coaching. And by relying on an EPSS, new employees will not only be able to complete their work more quickly and accurately, but they will also learn a great deal

more about their job and their company and hence contribute to knowledge transfer and organizational learning. The methods of EPSS vary widely, but generally fall into these categories of support:

- Mentoring (one-to-one coaching)
- On-the-job training (OJT) (structured and unstructured forms)
- Job aids (paper and online)
- Online help (Windows, web/html)
- EPSS databases (repositories of recombined EPSS objects)
- Embedded systems (context sensitive help)
- Threaded discussion groups
- Live online help (chat)

Often, many of these performance support forms will be combined, and what follows is an example from the enterprise resource planning (ERP) world that will help demonstrate this crucial role of an EPSS. In the succession of screens that follow, you will find an EPSS embedded within a common SAP[®] transaction dealing with time management. Although the system shown is “self-service” in nature and does not require formal classroom-based training, there is still a need for documentation, demonstrations, and simulations—all EPSS tools in their own right—to help guide users toward successfully completing their SAP-related work.

Welcome to RWD's SAP 4.6 Employee Self-Service Course



Course Intro 
Learn how to use this course

ESS Overview 
Learn the basics of the Employee Self Service Application
Offline - No Assessment Information Available

Time Management 
Learn how ESS can help manage and track your time
Offline - No Assessment Information Available

Travel 
Learn how to be compensated for company-related travel
Offline - No Assessment Information Available

Personal Information 
Learn to update ESS with your current information
Offline - No Assessment Information Available

Benefits 
Learn how to keep track of your benefits
Offline - No Assessment Information Available







Course Summary 
Review what you should have learned

Time Management

- Introduction to Time Management
- Time Management Data
- Enter Time Sheet Data
- Enter Leave Request
- View Leave Information
- View Work Schedule
- Cancel Leave Request
- View Time Statement
- Time Management Chapter Summary

Used by permission of RWD Technologies®

Home > Time Management
Page 1 of 18

More Resources - Microsoft Internet Explorer

More

Use these links to quickly reference the "How do you do it?" page for each task, where you can launch a printable step-by-step job aid, a demonstration, and a simulation, for all the tasks covered in the course.

Chapter Name	Job Aids	Demos	Simulations
ESS Overview	Using the Navigation Menu	Using the Navigation Menu	Using the Search Function
	Using the Search Function	Using the Search Function	
Time Management	Enter Time Sheet Data	Enter Time Sheet Data	Enter Time Sheet Data
Travel	Enter Expense Report Data	Enter Expense Report Data	Enter Expense Report Data
	Display Travel Expense	Display Travel Expense	

What is in this Chapter?
Duration: 45 minutes

Introduction to Time Management
Defines the Time Management application

Time Management Data
Explains the importance of maintaining accurate data

Enter Time Sheet Data
Describes how to enter data

Enter Leave Request
Describes how to enter data

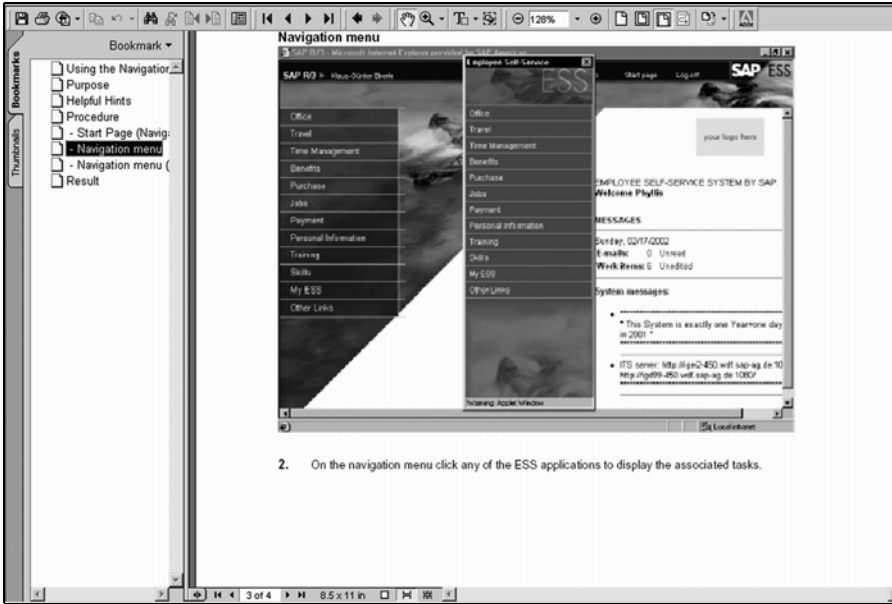
View Leave Information
Describes how to view data

View Work Schedule
Describes how to view data

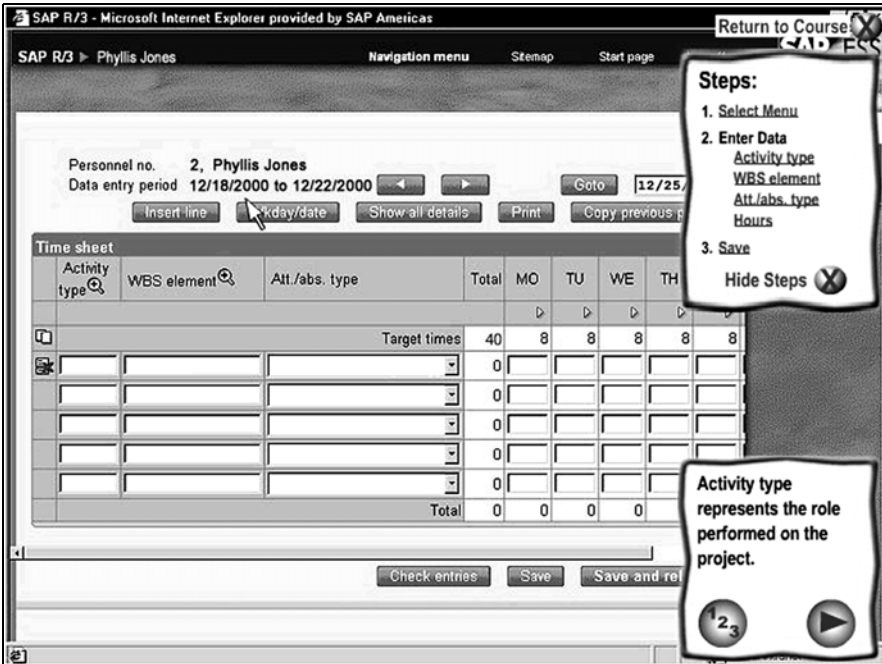
Done Internet Internet

javascript:openBrowserWindow('standard/html/more.html','More','status=yes,scrollbars=yes,width=640,height=480')

Used by permission of RWD Technologies®



Used by permission of RWD Technologies®



Used by permission of RWD Technologies®

What is interesting to note about this particular EPSS from a blended eLearning point of view is that it supports or augments a brief online training effort and yet could stand alone as a set of high-quality performance support tools. In other words, while the Time Management module presented here is ostensibly a 45-minute eLearning program, the embedded EPSS elements that are brought up from a “+” key at the top of the window could just as easily be launched from the SAP module they relate to—at the time of need—and hence serve a dual role as a multi-purpose EPSS. And when these supporting instructional or coaching materials are contained within a common information warehouse or knowledge base, they further enhance the notion of a Blended eLearning solution that leverages existing assets in a develop-once, deploy-many model of learning content development and delivery.

Recognizing the critical role that human performance plays in activities such as the one above, most businesses and organizations have attempted to identify better ways to support and enhance on-the-job work performance. An important driver in this effort is the growing need to cut labor costs by essentially enabling workers to do more with less. Although efforts to better support on-the-job work performance have taken differing approaches, an emerging centralized theme is the need to deliver task-specific information using some form of computer-based performance support technology at the exact time of need.

An important and interesting lesson learned from such efforts is that the “technology” part of the equation seems to play a minor but nonetheless important role. It appears that the various associated design activities, particularly those involving content design and configuration of a graphical user interface, dictate the program’s success.

Current Generation EPSS Implementations

Current EPSS implementations can use any combination of these major features:

- Online reference information
- Online help or decision aiding
- Task-specific computer-based training
- Expert advice for workplace problem-solving
- Task-related automation tools

In most instances, however, today's EPSSs seem to still focus primarily on online reference information and task-specific computer-based training. That is, most current performance support systems focus almost exclusively on displaying multimedia-based information in either a standalone or networked configuration. These mixed media formats commonly include text, graphical images, voice recordings, videos, and animations, all of which greatly add to the effectiveness of the EPSS. The typical benefits of such systems include:

- Quality of products as measured by the reduction of defects
- Training time and time-to-competency reductions by as much as 75 percent
- Cross-job flexibility that leads to better employee utilization and rotation

Capturing and evaluating these kinds of pre-defined performance measures help to assess the overall effectiveness of the training or learning interventions and provide the mechanism to sustaining individual and organizational goals by capturing best practices and lessons learned. This component of an EPSS is designed to do the following:

- Systematically and continuously measure the effectiveness of performance against pre-defined goals and targets
- Define where performance is below expectations so that corrective action can be defined and focused
- Determine where performance exceeds expectations so that action can be taken to build this into the way work is done to ensure that performance is sustained and continuously improved

Combined, these kinds of metrics can form a powerful basis for achieving performance objectives, for creating consistent and predictable performance, and for allowing organizations to efficiently and quickly convert new knowledge into practice through EPSS.

The EPSS-KM Connection

An EPSS can also describe “how” information and knowledge are delivered to the performer and “when” that information will be needed, thus recognizing that an EPSS is most often used when maintaining information within memory that is either impractical or undesirable. Hence, the activity of performance support itself can draw from elements found in online learning and knowledge management as well as those specifically designed for performance support. Furthermore, an EPSS can provide structured access to predefined information or knowledge nuggets or granules (such as procedures, troubleshooting guides, and learning pieces related to specific tasks) as well as unstructured access to knowledge bases loaded with task-related content (such as case histories, best practices, etc.).

The key to transitioning from EPSS into a true KM practice is collecting the tacit knowledge held in workers’ heads and incorporating that knowledge into some type of collective corporate memory that can be used to solve real-world problems. In

other words, while we might have access to a great deal of information and knowledge, we still need a way to make these assets meaningful in terms of the performance we want to achieve with them. If information is the “what” and knowledge is the “when, how, and why,” then clearly performance support interventions such as EPSS can bridge the two. Yet, performance support can serve both our information and knowledge needs, for an EPSS can distill information and knowledge into usable chunks and deliver it accordingly. Rather than sending someone wading through piles of documentation, an EPSS support tool can offer them concise procedural steps for the task they are about to perform. And performance support can also answer the “when” and “how” questions of knowledge seekers by providing materials that answer those questions.

The bottom line is that the aim of both EPSSs and KM systems is to create learning organizations that provide equal access to, and leveraging of, corporate memory. A learning organization denotes a structure of practices, systems, and culture that promotes sharing experiences and lessons learned to encourage quality performance and continuous improvement. Corporate memory includes all the information and know-how that a company possesses. But sometimes this memory is only captured as explicit knowledge and ignores the more important undocumented tacit knowledge. Here is where KM attempts to open the vaults of tacit knowledge stored in people’s heads and add it to an active corporate memory and by doing so offer higher quality resources for training purposes and performance support purposes.

Hence, the object of a KM system is to capture users’ tacit, practical knowledge and make it available as part of the system. That’s why EPSS is the first step toward KM; it puts knowledge and information where it’s most needed. But knowledge is not just in the heads of expert users; it’s in the hands of all users. For this reason, it’s important to realize that a KM system is not just a repository for corporate memory, but a reflection of corpo

rate consciousness or group-think. The thinking part is the ability of users to share their knowledge and enhance the system's contents and functions. This ability generates a dynamic work environment that fosters collaboration and innovation. The result is a system that actively supports continuous performance improvement, not just the one-time formalization of a process. Of course, the challenge for EPSS designers and developers lies in planning how to bridge the gap between the EPSSs of today and the KM systems of tomorrow. A practical approach for crossing has two stages: tapping tacit knowledge and then spreading the knowledge throughout an organization.

The first stage focuses on how information is gathered for the analysis and design of an EPSS or a KM system. Many current performance support efforts are limited to the use of existing, explicit documentation for a process or system. Relying on explicit knowledge limits the progress that can be made with the EPSS, both in terms of effective process support and in bridging to KM. There are a number of strategies that can be applied to extract and leverage tacit knowledge. Most importantly, you need to get out of documentation and learn how things work on the floor. Watch the system in action and talk face-to-face with the target audience. Users can tell you what they do and what they currently use to get the job done. They might have a library of unofficial (tacit) work aids they use regularly. This information can be essential in guiding your approach to performance support interventions and may even do some of the work for you.

To expand the value of data collection, talk to supervisors and downstream clients of the process or system. Supervisors can clue you in to how the users respond to the system, as well as trouble spots that might be good candidates for support interventions. Similarly, downstream clients can help identify areas of weakness or inconsistency that need clarification and support. This kind of information is rarely captured formally, but can

prove invaluable in the success of a performance improvement intervention.

In addition to helping you design better support tools, tapping tacit knowledge provides the opportunity for process improvement. Shocking as it may be, what users do with a process or system does not always match what the documentation says. This is why it's dangerous to rely solely on explicit knowledge. By reconciling the explicit knowledge of documentation and the tacit knowledge of users, supervisors, and clients, you can develop an improved and unified approach.

For example, even if users are performing their tasks correctly, the system might not provide all the information that's needed downstream. A downstream group may feel this is due to user error and begrudgingly correct the error rather than isolate the system problem that created it. The process of tapping tacit knowledge at multiple levels may highlight needs and inconsistencies, such as those that involve people or systems. This new insight can lead to meaningful improvements and better overall performance.

The second stage of bridging to KM focuses on how information is gathered and applied. This step can boost an EPSS into the realm of a KM system. The key is to allow users to input their tacit knowledge directly into the system. Once you tap the tacit, give it the opportunity to keep flowing. Few current systems allow users to do anything but work. This forces users into the position of creating personal libraries of tacit knowledge to support their performance. A KM-oriented EPSS enables users to share questions and tips by creating the opportunity for user input. At first, this could simply be a *LISTSERV* or electronic bulletin board where users post questions or comments. The idea is to establish an environment of sharing that involves a two-way knowledge flow. This is a start in capturing users' tacit knowledge in an online form and adding it to the corporate memory.

As the flow of tacit knowledge increases, you can integrate input opportunities directly into the system. Likely candidates for online knowledge sharing include the following:

- Comments and questions about content
- Tips and tools provided by users
- Work (processing) examples
- Best-practice case studies

As an EPSS becomes more robust in KM capabilities, it opens even more continuous improvement opportunities to enhance the knowledge and performance of the company. Process improvements and system enhancements can be made by applying user comments and knowledge that are captured online. Openly encouraging and applying new ideas foster the cooperation and innovation that are critical to a learning organization. With all of this system-based sharing going on, you may wonder about the role of training in the new organizational order. While evolving EPSS create bridges to the future, training is still needed to provide direction to the bridge and lead the charge over it.

Anytime something new is introduced, people need to be shown where it is, what it can do for them, and how to use it. This has always been part of training's responsibility, and EPSSs and KM systems don't change the need. A common mistake that many companies make is thinking such systems are so user-oriented that they don't require training. This fallacy has doubtlessly led to the failure of many worthy systems. Before a system can work, users must be prepared to use it. Training should provide the direction needed to clarify the company's new approach. This goes beyond teaching users the functional aspects of new systems and capabilities. Providing direction means introducing the new concepts required to successfully implement KM programs. Training must show people the map to the future and build their confidence in the journey that is to take place. Without such preparation, people

may be more inclined to jump off the bridge than to continue to the other side.

A new direction for training in the transition to KM systems is teaching people how to interpret information and think about appropriate actions. Most current training, even that relating to EPSSs, focuses on the skills needed to follow explicit directions (for instance, how to access and follow step-by-step procedures, how a system functions to perform tasks, and so forth). A knowledge-based worker must not only know where to find information and how system functions operate, but also how to interpret information and apply it appropriately.

For example, in current EPSSs training, a user might be taught how to apply a performance support tool for a specific task. With a KM-oriented system, there is no longer just one tool for a task. There may be a procedure, user tips, process examples, and a case study related to the task. The user must know how to take all of this knowledge and determine what applies to the current situation. Rather than simply learning to perform a task, a user needs to learn how to think on his or her own given current information, and then know how to take the appropriate action.

A trainer's duties don't end with preparing people and leading them to the threshold. Training must also actively lead the charge over the bridge. People often resist change, even when it makes sense to them. As a training professional, you have a stake in seeing that all of your preparation doesn't go to waste. Users may need continued encouragement as new processes and systems are implemented. While management plays a large role in the success of this phase, training can help by offering transitional mini courses and on-the-job coaching to bring users along.

Another role for training is to be a champion for the continuous improvement implications of an EPSS and KM system. It's not enough to gather the users' tacit knowledge with the system; this knowledge needs to be analyzed and applied. Trainers—

often the leading advocates for users—can team with other groups to formulate process improvements and system enhancements.

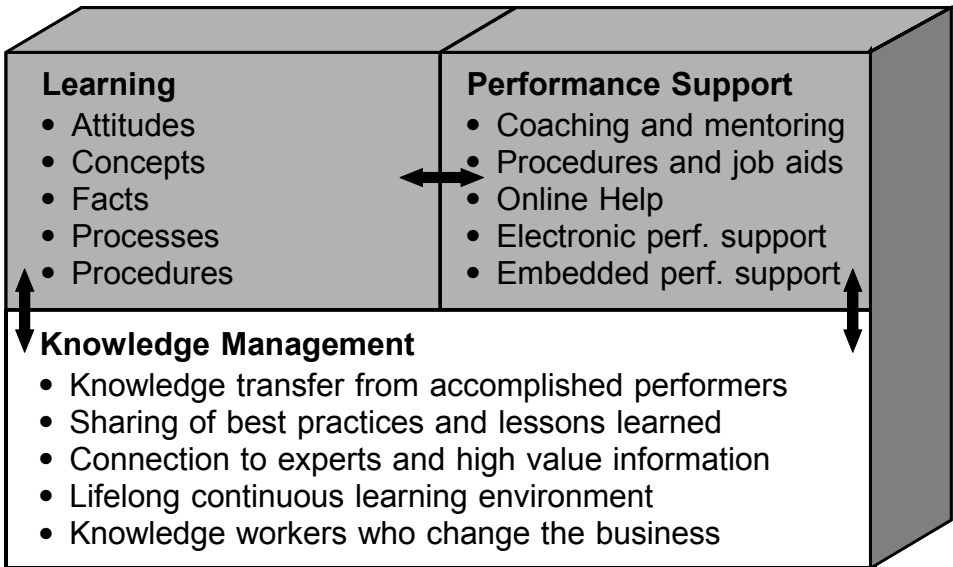
Finally, trainers should continue communicating with users as processes and systems are revised and enhanced. Users can become frustrated if things change unexpectedly. For small changes, a simple system notice or update newsletter may be adequate. For more significant enhancements, supplemental training sessions may be needed to keep everyone up to speed.

Blended eLearning Through EPSS and KM

Training and performance professionals are positioned to be the new leaders of future blended eLearning Solutions. But rather than waiting for new directions to come from management as learning systems become more broadly applied, they can take performance support tools such as EPSS and KM systems and begin building bridges to training and learning activities today. Knowledge and action go hand in hand, so who better to take an active role in changing the world than performance and development professionals? Combined with online learning and KM, the EPSS implementations of today stand ready to be leveraged into new areas of utility within the blended eLearning model.

Chapter 3

Knowledge Management Systems



“If we apply knowledge to tasks we already know how to do, we call it productivity. If we apply knowledge to tasks that are new and different, we call it innovation.”

— Dr. Peter F. Drucker

Defining Knowledge Management

As we have suggested in the preceding chapter, perhaps the most important dimension of a blended eLearning solution is the system's knowledge management, or KM, component, for it is here that content is contributed, leveraged, and stored so that it can be re-purposed in a variety of ways to support learning, performance, and development activities. Hence, the Peter Drucker quote above helps establish the main reason why it is necessary to include knowledge management within the context of blended eLearning, for only KM has the capacity to sustain and improve organizational learning practices while also inspiring quantum leaps in innovation that help an organization keep pace in a rapidly changing world.

When it comes to KM—which has, at times, been an over-used and misunderstood term—there are of course many working definitions. But within the context of blended eLearning, one that seems particularly relevant comes from Davenport and Prusak's book *Working Knowledge*:

Knowledge [management] is a fluid mix of previous experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers.

— Davenport and Prusak, *Working Knowledge*

What's important about this definition of KM is that it allows knowledge to be a process as much as a thing, which is crucial to the notion of creating flexible learning content that can be re-used or re-purposed in a variety of ways. Or, put another way, "Knowledge is the capacity to take effective action" (Peter Senge, *The Fifth Discipline*).

The Davenport and Prusak definition of KM is general and objective in nature, making it a good starting point. But in his book entitled *E-Learning: Strategies for delivering knowledge in*

the digital age, Marc Rosenberg provides additional amplification and clarity on KM that will serve our purposes here.

The creation, archiving, and sharing of valued information, expertise, and insight within and across communities of people and organizations with similar interests and needs with a goal of building competitive advantage.

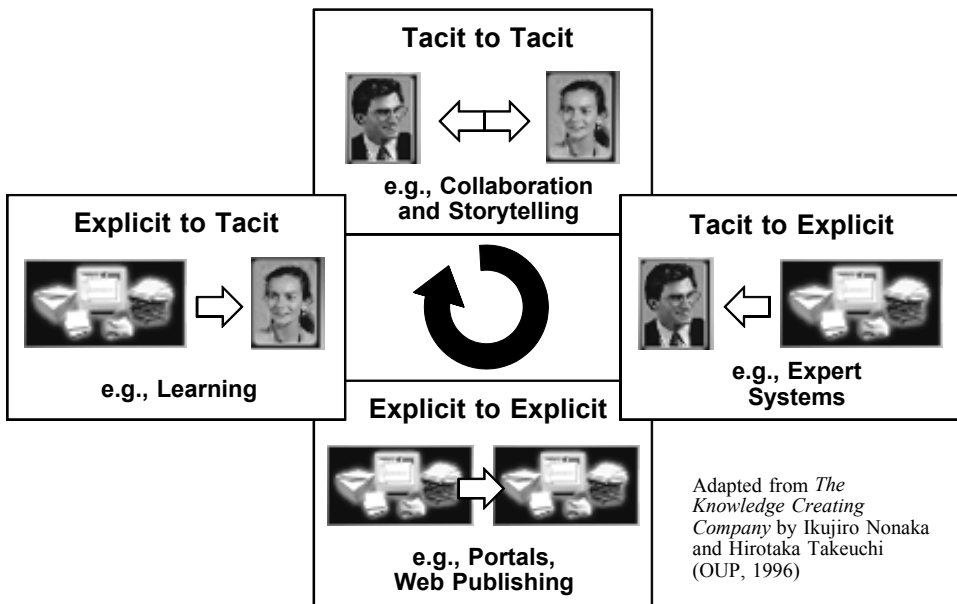
— Marc Rosenberg, *E-Learning*

What Rosenberg has added with his definition of KM is the notion of *context*—that is, not just KM for KM's sake. Rather, he sees KM as a tool for creating community, for sharing knowledge and insight, and for achieving competitive business advantage. In this broader definition, knowledge management refers to knowledge generation, codification, and transfer in both its *explicit* and *tacit* forms. And it is precisely these forms of knowledge that are useful in creating successful Blended eLearning solutions, which often exhibit these features and business objectives:

- Knowledge transfer from accomplished performers to others
- Sharing of best practices and lessons learned with a broad work force
- Easy connectivity to experts who hold high-value knowledge
- Promoting a lifelong continuous learning environment
- Enabling knowledge workers who can affect the bottom line

To see some of these benefits in action, we offer an example drawn from industry. On the next page is an adapted pictorial from Jeff Wessel, Knowledge Manager at Northrop Grumman, which depicts how knowledge often moves within an organization.

How Knowledge Moves



While such a depiction of knowledge flow looks advantageous, these KM flows do not occur automatically. When creating blended eLearning solutions, there are three critical sets of actions that managers (as well as instructional designers) can take to move their organizations toward becoming more knowledge-driven enterprises.

First, managers or KM stewards need to continually reflect on knowledge as an organizational phenomenon. Because knowledge is distinct from data and information, considerable discussion and reflection are required to develop a consensus about knowledge itself. In particular, the KM leadership team needs to take the following steps:

- Develop a shared understanding of knowledge at local levels, since it is often difficult to define at the enterprise level.

- Allow individuals frequent opportunities to discuss and debate how knowledge is created and shared.
- Help individuals identify their current and desired knowledge-sharing roles.
- Ask individuals to identify knowledge implications for business processes.

Second, KM managers must be obsessive about noting and correcting errors in their stock of knowledge—or, more precisely, in what they think they know. Such attention must go beyond a mere verification of so-called “facts,” that is, descriptions of what is unambiguously true. Unfortunately, this sort of attention is the inevitable focus of a data- or information-dominated view of knowledge. However, facts constitute only a small part of the “stuff” of decision-making. Therefore, managers need to continually expose knowledge content and subject it to scrutiny in every possible way. In doing so, they will quickly come to recognize one critical consequence of the flow perspective of knowledge: substantial portions of knowledge content are always tentative, temporary, and subject to change. There are few absolutes. It is imperative that managers ask the following questions with regard to customers:

- What do we know, or think we know, about different aspects of our customers?
- Do we know our own perceptions, beliefs, assumptions, and projections about different categories of customers?
- How does what we know and what we don’t know about customers affect specific decisions?
- What do we need to know about potential customers to make specific decisions and how is it different from what we think we know?
- What errors might reside in what we think we know?

- What might be the consequences of these errors?
- How might we rectify these errors?

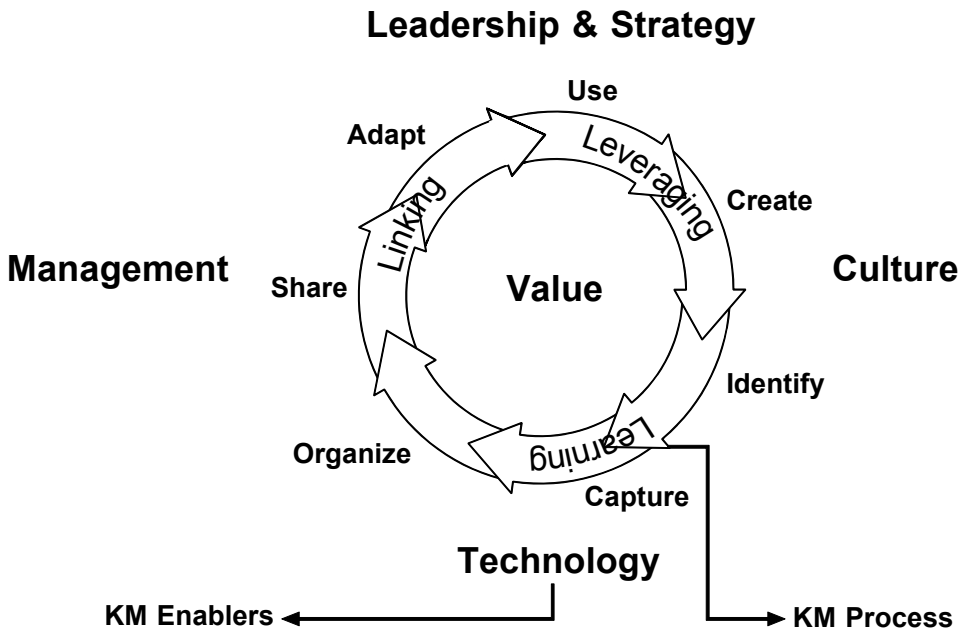
Third, managers must be vigilant about detecting and correcting errors in their processes of knowing—the generating, moving, and leveraging of knowledge throughout the firm. Such learning processes are often deeply embedded in the way the organization does things. Questions managers need to ask are

- Which individuals play what roles in developing and testing information?
- Which individuals, or categories of individuals, are not involved in dialogue around specific issues and topics? How might their involvement affect the content and flow of knowledge?
- How is knowledge flow facilitated or impeded by the organization's structure and systems?
- How does tacit knowledge influence the generation and transfer of explicit knowledge?
- How is technology used to unearth and influence tacit knowledge?
- What role do experiments play in knowledge generation?

In sum, an organization must engage in critical, sustained, and honest self-reflection about the errors noted in this section. By doing this, it can avoid the pitfalls that are evident in the approaches of many organizations' attempts to work with knowledge. What is needed, then, is an overall KM leadership strategy.

Developing a KM Strategy

In this section, we will focus on the process of knowledge generation, organization, and use. While different KM practitioners have taken the process to various levels of granularity and used a variety of terms, Davenport and Prusak use the terms *knowledge generation*, *codification and coordination*, and *transfer* as the key descriptors for the overall KM process. Marc Rosenberg, in contrast, uses the terms *creation*, *archiving*, and *sharing* in his book *E-Learning*. And the American Productivity & Quality Council (APQC) has an expanded model, shown below, that includes create/identify/capture, organize, and share/adapt/use. Each of these descriptive processes follows the same functional steps of generating, organizing, and using knowledge.



Used by permission of American Productivity & Quality Center

The framework above goes into more detail than the general models that are in use right now. Through many APQC publications, this model has been widely accepted in practice in the KM community. For further reading, our readers may want to go to the APQC web-site, <http://www.apqc.org>, to review additional information on the process, the enablers, and their practical implementation represented in the various case studies.

Technology Solutions for KM

Clearly, knowledge management is about more than just technology. The initiatives involve people, process, and technology, and below we focus on some of the technologies that make enterprise/organizational KM even possible. To distinguish between general KM and technology for KM, we'll refer to the technologies as knowledge management systems (KMS). There are a number of general resources for information on KMS development and product suites listed in the additional resources chapter. In addition to this more detailed information, the following list is a good starting point for categories of KM tools that support blended eLearning:

- Content portal technologies
- Collaborative filtering techniques
- Intelligent agents
- Taxonomy generators
- Search engines and text retrieval
- Directory technologies and expertise locators
- E-mail filters
- Data warehousing and business intelligence tools
- Collaboration technologies (discussion boards, chat rooms, peer-to-peer)
- Virtual synchronous classrooms
- Digital content asset management systems
- Content management systems (web-based)
- Electronic Document Management Systems (EDMS)

- Expert systems
- Digital library technology
- Knowledge map software

Past KM Successes

“If we only knew what we know at TI,” is often quoted from Jerry Junkins, former chairman, president, and CEO of Texas Instruments. Yet with all the talk of forming a “Learning Organization,” few companies really know where or how to start implementing an effective knowledge management system and how to extend learning beyond the walls of training organizations. In order to create a learning organization that can capture, manage, and disseminate knowledge, it is necessary to consider technologies that can make this process easier, more cost-effective, and widely distributed.

Surely, ROI-based success stories of KM do abound, and here are just a few of the headlines from recent years:

- “Dow Chemical increases annual licensing revenues by \$100 million by managing its intellectual assets.”
- “Silicon Graphics manages its product information communications processes and reduces sales training costs from \$3 million to \$200,000.”
- “Steelcase realizes an upswing in patent applications and a threefold increase in productivity after implementing knowledge sharing processes across multi-disciplinary customer teams.”
- “Texas Instruments avoided the cost of building a \$500 million wafer fabrication plant by leveraging internal knowledge and best practices.”

Knowledge Management and ROK

But an even more important concept in KM is the determination of return on knowledge, often referred to as simply ROK. Studying ROK involves both a quantitative and qualitative analysis of opportunity costs associated with loss of organization memory and key technical know-how. This analysis often involves reevaluating the concept of corporate knowledge “assets” and how they are used. And typically, the ROK business benefits do not easily lend themselves to a quantifiable model, as shown in the following examples of KM at work:

- Allowing users to access relevant knowledge through an employee portal that has easy-to-navigate directories or natural language queries, thereby adding depth and breadth to KM practices
- Profiling employees so that other users can identify colleagues with relevant skills and knowledge to help solve business problems
- Delivering highly personalized knowledge and information that helps employees stay on top of industry events and competitive intelligence

For this reason, it is necessary to look at KM ROK from a variety of perspectives with questions in four key areas—strategy, process, support, and application—as defined in greater detail below.

KM Strategy

- How well does the KM strategy match the business culture?
- Does the strategy identify knowledge as a core strategic asset?
- Does top management understand the need for KM and are they willing to make a commitment to its practice?

- Are the major stakeholders and decision bodies on-board with respect to KM?
- Has the KM strategy been defined in sufficient detail to estimate its impact?
- Are KM practices understood as value-adding?
- Is there a business culture that favors a learning organization?
- Will there be a high-level KM committee or chief knowledge officer (CKO) in place to steward activities?

KM Process

- Have relevant knowledge areas or domains been defined along the lines of core business capability?
- Are there too few or too many of these knowledge domains to be useful?
- How will communities of practice (COPs) contribute to the KM process?
- Is there a process for new COPs to come into place and for others to retire?
- Have KM processes for sharing best practices and lessons learned been developed?
- Are knowledge bases now in practice accessible to the right people?
- How integrated is the KM process with other existing work processes?
- Do corporate “yellow pages” of expertise fit into the KM strategy?
- Will benchmarking processes be used to promote and evaluate the KM process?
- How well linked are the communities with external sources of expertise?

KM Support

- Does a central KM office exist with a CKO at its head?
- Is there a need for a formal KM office within the organization?
- Are the KM practitioners in the business units or HR organization?
- Are KM tools available for creating COPs and KM repositories?
- Is there an evolving KM methodology in place?
- How is community participation with KM practices established?
- Are KM contributions seen as part of the performance assessment process?
- Is the company information portal considered part of (or central to) KM technologies that support collaborations?
- Have standards for knowledge transport and security been established?

KM Application

- How is knowledge tracked, managed, and applied within the organization?
- Are COPs used to solve business problems or are they merely information-sharing forums?
- How is a knowledge base used and leveraged across the organization?
- Does existing knowledge contribute to the creation of new knowledge with the plan of a learning organization?
- Is there a mechanism for separating explicit from tacit knowledge and applying each appropriately?
- Are the competency modeling and skills development processes tied to KM efforts and performance objectives?

KM's Contribution to eLearning and Performance Support Practices

Knowledge management, no matter how it might be implemented, can add greatly to eLearning and performance support practices, often by simply using off-the-shelf KM-related technologies. In fact, KM solutions in the marketplace today can add significant value to an organization in areas such as knowledge transfer, document management, and workflow—all of which support learning and performance. KM's contribution will typically fall into one of these four areas:

- **Integration**—Provide a single system through which workers can locate and retrieve organizational knowledge
- **Contribution**—Provide a means for added captured knowledge, in structured and unstructured forms, from formal documents to threaded discussions
- **Expertise Location**—Identify people by their subject matter expertise area and then return their relevant contact info or profiles
- **Organization**—Collect and store in one place all available knowledge assets through categories or taxonomies that can be leveraged and reused in eLearning and EPSS situations

With these kinds of contributions toward a blended learning solution, KM practices allow for the following high-value activities to occur, such as:

- Capturing expert knowledge transfer from retiring work force for competitive advantage
- Deploying standardized best practices for achieving consistency and efficiency in work processes while eliminating redundancies

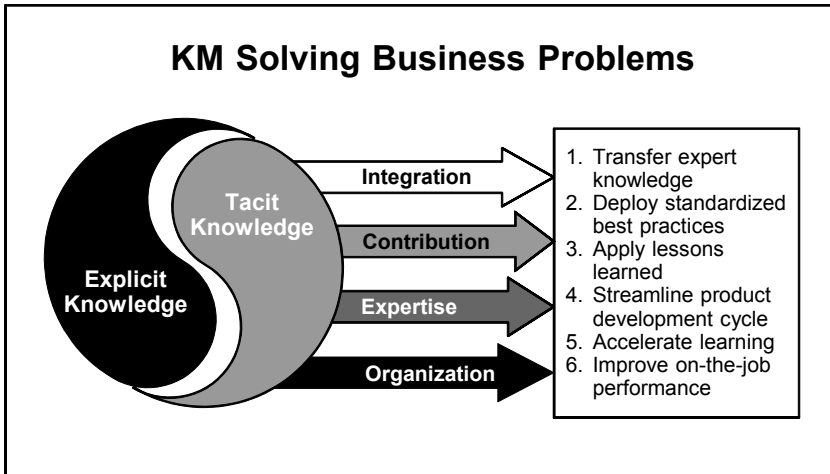
- Fostering “lessons-learned” sharing for continuous improvement by establishing a learning organization that is tied to business metrics
- Streamlining product development cycles by eliminating waste and rework, and by integrating complex knowledge sources that support rapid decision-making
- Accelerating training and learning programs by reducing time-to-competency and increasing proficiency for new workers while building cross-functional skills
- Supporting on-the-job performance by pushing just-in-time knowledge in a timely, accurate way

In addition, many companies today are recognizing a need to improve their internal KM methodologies, their resource-sharing practices, and their project management processes, especially when approaching the complexities and business impacts of knowledge management projects. Here integrating other software development and implementation methods with KM will provide a foundation for a standardized KM process that:

- Combines the best practices from systems/software development and technology implementation methodologies, project management, human performance technology, training, and quality assurance into standardized work processes
- Is properly customized to the work environment and corporate culture
- Incorporates lessons learned
- Is targeted to meet business goals and objectives and therefore has management’s support

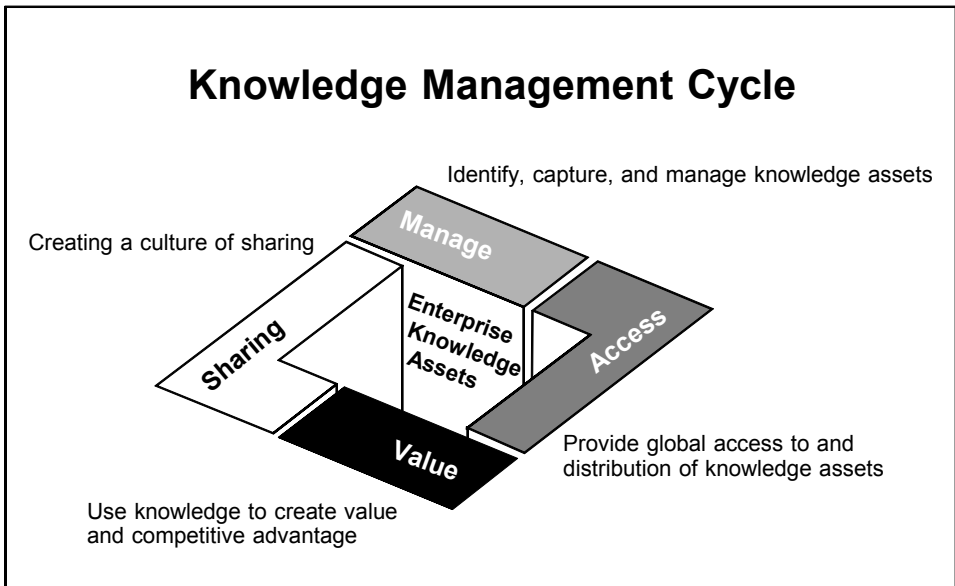
Applying KM to eLearning Problems

Combined, then, the strategies, processes, support and applications of knowledge management can form the cornerstone or foundation for blended eLearning solutions that help solve complex business problems, as shown in the graphic on the following page.



What this model suggests is that people with highly valued skills and competencies, who are well trained and following a proven KM process, stand to offer incredibly high value to an organization. This is the essence of understanding return on knowledge, or ROK. At a lower level, ROK is a measurable improved competency and an increase in the bottom line results of an organization. These levels deal with the effect of training and knowledge on the overall mission and bottom line success of an organization. Establishing systems and processes that aid in capturing and managing the asset of usable employee knowledge is a critical goal to organizational survival in the information age.

In this sense, related KM work in the development of a total training or eLearning solution will provide a baseline for applying these efforts to a larger, more encompassing learning system. And conversely, some of the same innovations, techniques, and technologies used for training or learning can also be effective for the development of enterprise-wide knowledge management practices. Thus, knowledge management itself can be seen as an endless cycle or process, as shown in the graphic below, beginning or ending at any one of the critical stages of managing, accessing, creating, or sharing knowledge.

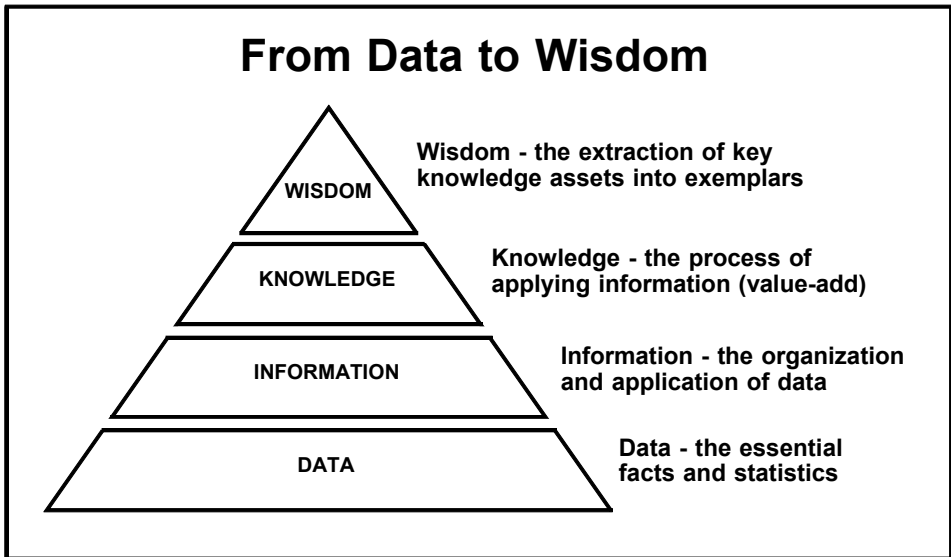


The Application of KM to Blended eLearning

Given the over-arching promises of knowledge management, it is difficult to understand exactly why KM fell out of favor for a time. Perhaps over-inflated claims or under-inflated commitment levels might be to blame. But with the passage of time, we've gained some perspective on what works and what does not work in KM. And with respect to its relationship to blended eLearning, we can now see how KM can expand its scope and utility beyond training and IT departments to the strategic, organization-wide level. The key is to enable knowledge management systems to reach connection points between traditional learning system components and knowledge components.

Here, the context and use of KM are probably the key differentiators. Also, if the learning initiative is viewed holistically, one can build training, performance, and other business line knowledge elements from a single knowledge base using common communication tools between all three areas. This also leaves organizations open to future areas of expansion that far exceed what we traditionally think of as "training." As we have mentioned before, the first three areas of blended eLearning—learning, performance support, and knowledge management—are just three initial areas that could leverage enterprise links to other key systems. In future chapters and on the book's accompanying web-site, we'll explore the integration of other enterprise applications, like HRIS, CRM, CMS, ERP, and EDMS, with blended eLearning.

What should be clear at this point is that knowledge management—whether it's seen as a technology, practice, or discipline—can easily become a bedrock component of blended eLearning. For just as we move from a fact-driven training model to the creation of a performance-driven learning organization, the necessary evolution from data to wisdom, as shown in the following graphic, will become ever more central to the blended eLearning solutions we create.



KM Resources

While there are a good many resources on KM that are cited in the book's companion web-site, a particularly rich collection of references is located with the "ITtoolbox on Knowledge Management," which is shown in the graphic below, and located at <http://knowledgemanagement.ittoolbox.com/>

eLearning/KM Case Study: Hyperwave

Hyperwave eLearning Suite

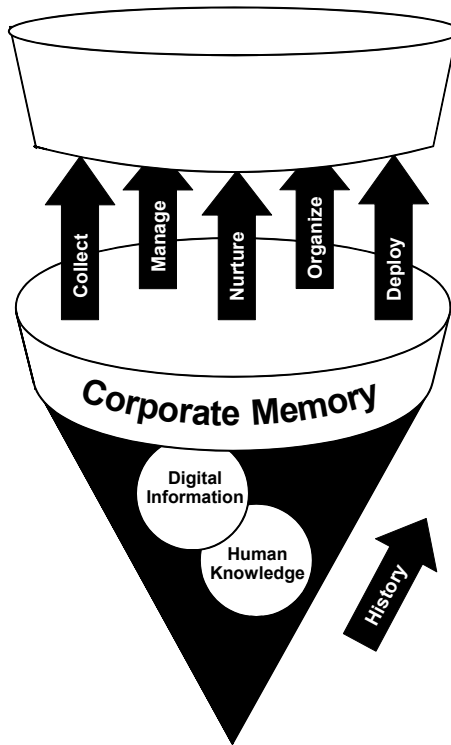
Surveys of businesses that use web-based or computer-based training programs have found that their employees most often miss the opportunities afforded by communication and cooperation.

After all, it is a proven fact that people retain information better when in addition to the material to be learned they also have the opportunity of informal learning.

Hyperwave eLearning Suite encourages informal learning with numerous synchronous and asynchronous communications tools, such as email, chat, and discussion forums, tailored and available specifically for each course.

Moreover, Hyperwave eLearning Suite lets users create private or public notes directly in the course content and then send them the respective tutor for a response.

The special feature here is that both the question as well as the answer can be saved and made available to future course participants. So with the ability to retrieve and process course content at any time from any location, the efficiency of training programs improves noticeably.



Beyond Courseware—“Holistic” eLearning Leverages Corporate Memory

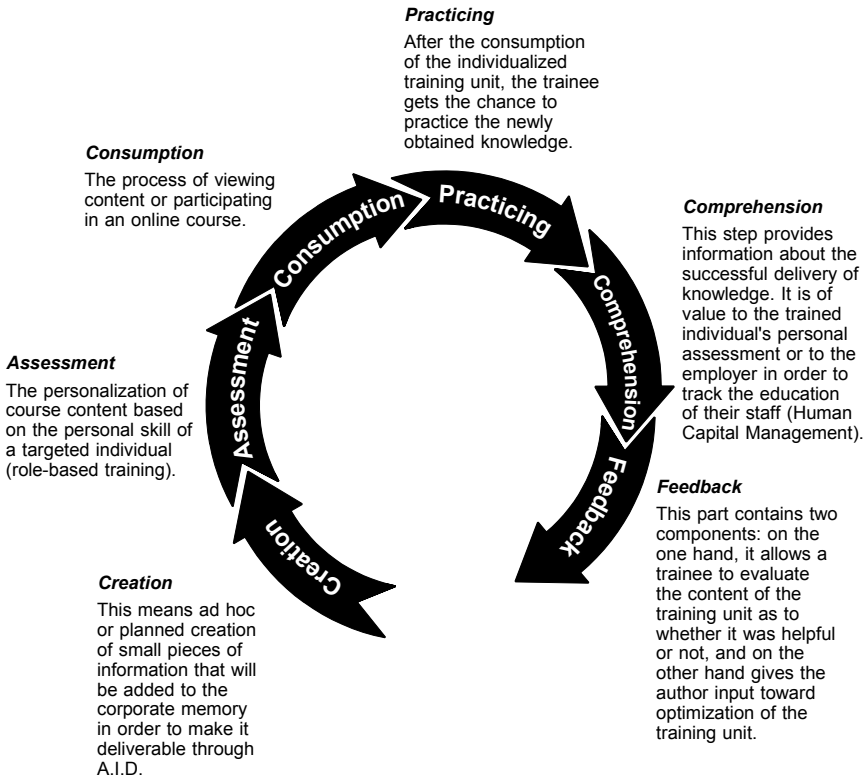
eLearning alone is not enough. Though online training will have dramatic benefits, it's only part of the solution. The benefits of true organizational learning go beyond the traditional “course,” whether it is in the real world or in the virtual world. What is equally important is to harness the collective knowledge and experience of the entire company. In short, the challenge for companies today is to combine topical material with the collective knowledge and experience of an organization's staff.

Corporate memory, made up of the information that is found within the company, often includes huge collections of documents and discussion forums that have been collected over time. It also represents the experiences of organizational members—regardless of whether an endeavor was successful or not. The key to effectively accessing corporate memory lies in taking a very dynamic approach to content.

To raise it to its full potential, it needs to be collected, managed, organized, and made easily accessible to all members of the organization. In fact, the system needs to be proactive in alerting interested parties to new information that will help them better accomplish their job. It also needs to proactively and reliably inform individuals of new or updated content that is relevant to them based on personal preference or job function.

Assured Information Delivery (A.I.D.)

The following discrete steps describe the effective eLearning process to deliver any piece of corporate memory to a predefined group of participants. **A.I.D.** is the implementation of this process within Hyperwave eLearning Suite to support knowledge management-based eLearning within an organization. **A.I.D.** is the process for **assured information delivery**. When done correctly, it is a closed feedback loop.

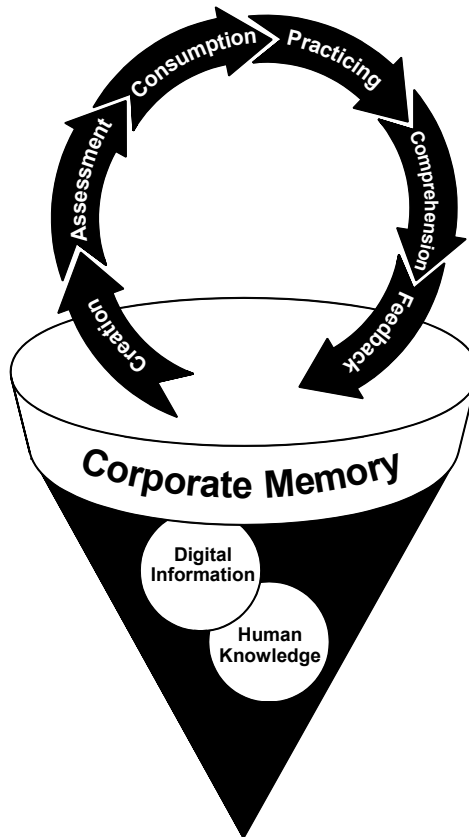


eLearning Optimizes Business

Although still today misunderstood as WBT, eLearning is actually the integration of different tasks into a “holistic” solution with the goal of managing, multiplying, and conveying corporate knowledge.

Knowledge management and training are integral and closely associated parts within a single framework. Knowledge management allows effective control and management of the corporate memory—the knowledge that is within the organization.

Knowledge management makes it possible to store content in such a way that it can be found easily, that virtual teams can process the information together, that content can be kept up-to-date and correct by implementing feedback, and, moreover, that assessments can be performed as to its usefulness.



Be Smarter Wherever You Are

If an eLearning solution enables you to make content of the knowledge repository directly accessible to individuals using ad hoc courses or as part of a planned and laid-out curriculum, there is an added value through the integration of KM and WBT components.

eLearning—Integration of Related Disciplines

Intuitive authoring tools built right on the knowledge repository provide centralized management of corporate knowledge as well as course content and thus fast and efficient maintenance and short-loading cycles in order to convey new content of current interest within the organization. As experience shows, conveying information is, however, only one part of knowledge generation since most knowledge is the result of the exchange of experience and interaction. Chats and discussion forums integrated with the web courses meet precisely this requirement. As a result of corporate knowledge, a virtual classroom evolves, which in addition to the classic “live training program” makes a dialog/interaction possible despite “distance learning.”

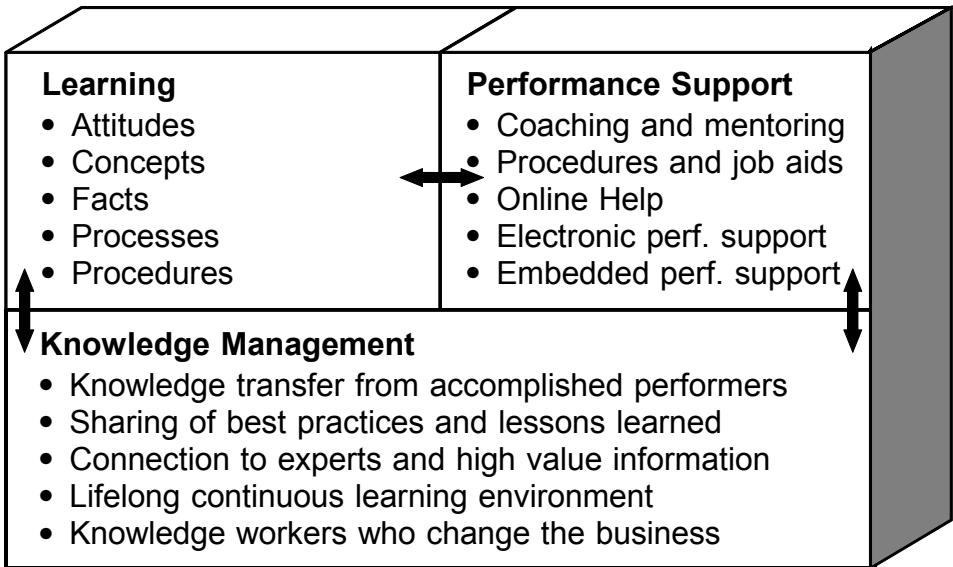


Used by permission, Hyperwave AG

This page intentionally left blank

Chapter 4

Integrated Blended eLearning Solutions



Most training and development organizations or departments in the world today are talking about the blended learning model, and yet what's interesting is that they're not necessarily talking about the same thing. This is not surprising, however, since learning—which includes all types of training interventions as well as the various forms of continuous education—is a costly, complex, and time-consuming task for most companies at a time when they can least afford it. So, as we stated earlier, to most

people, even blended eLearning simply means combining instructor-led training with some form of eLearning in a way that makes sound business sense—that is, an approach that reduces cost or increases performance, preferably both. But the premise of this book is that blended learning can equally and simultaneously mean a blend of enabling technologies in order to create a hybrid model that merges elements of online learning, electronic performance support, and knowledge management to not only make immediate business sense, or return on investment (ROI), but also to offer a strong return on knowledge (ROK)—or the expansion of intellectual capital for competitive advantage and innovation.

Consequently, a more thoughtful and detailed answer to “What is blended learning?” is that it can mean both blended delivery methods as much as it can the blending of technology-based learning solutions that are aimed at attainable performance goals. This latter type of blended learning solution is sometimes referred to as simply “eLearning,” which somewhat masks the larger convergence of technologies and practices that are taking place. And yet eLearning projects have allowed many businesses and organizations today to discover approaches that integrate the best features of eLearning with other means of sharing knowledge in a powerful way, and the Internet and the web have given us many new and exciting options for blending our overall learning, training, and knowledge management strategies. For example, it’s now possible to deliver not only self-paced instruction over the web, but also rich media simulations, group collaborations, real-time synchronous learning sessions, online assessments, and performance support solutions.

Creating a Blended eLearning Process and Infrastructure

So, then, what might a blended eLearning process model look like and how can we best build an infrastructure to support it? When we think about a blended eLearning infrastructure, we are tempted to visualize a hub-and-spoke model in which the management of learning or learners is at the center of the process. But from a business point of view, a blended learning model that is driven by performance objectives and business metrics would more likely look like the process depicted in the diagram below.

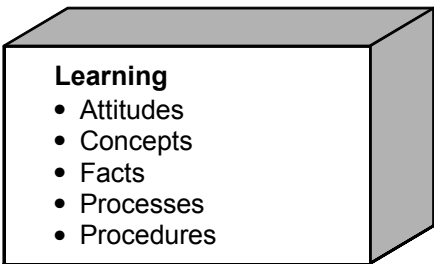


Courtesy RWD Technologies®

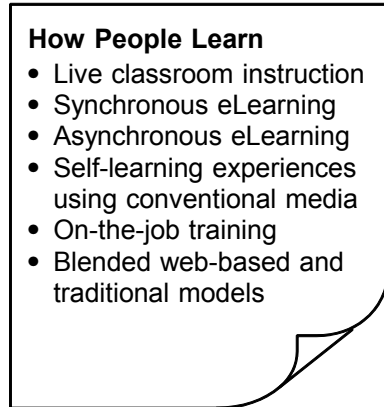
Such a model affords a powerful and cost-effective continuous learning solution that combines the following elements:

- **Learning**—Whether it's classroom, work place, web-based, or Intranet/Internet based, and delivered in a “live,” just-in-time, or self-paced mode.

The First Building Block

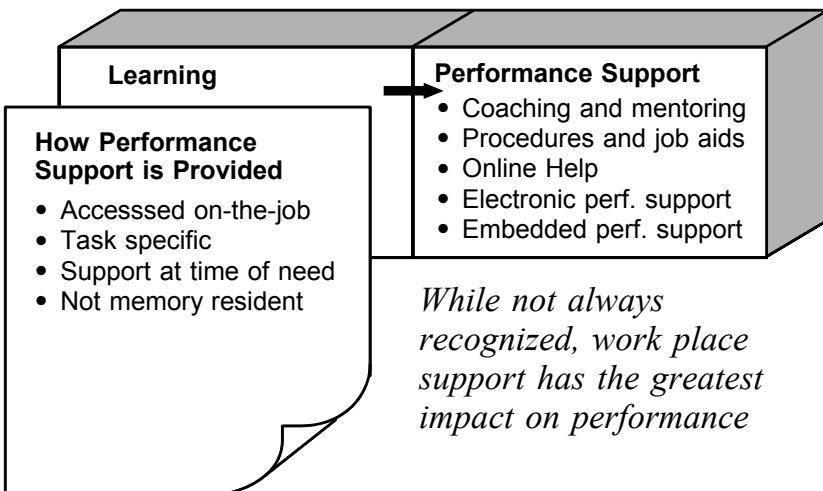


People have basic learning needs in any organization

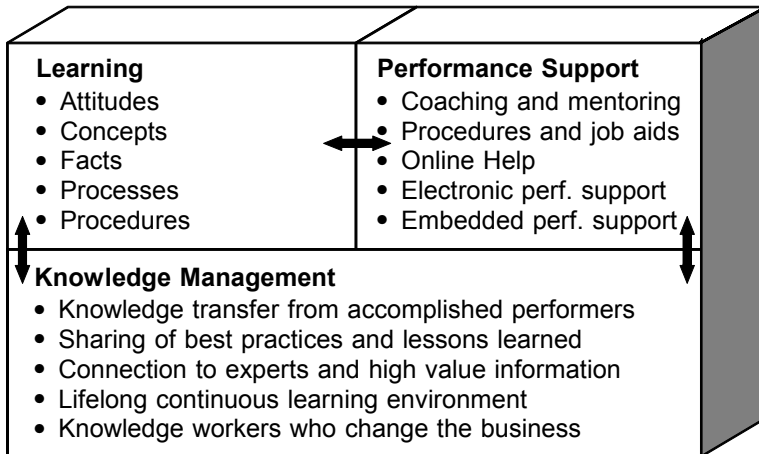


- **Performance Support**—Job specific, work place resident, paper-based, electronic, context-sensitive, and embedded support mechanisms such as job aids.

The Second Building Block



- **Knowledge Management**—Those key documents, expertise directories, lessons-learned databases, best practices, and communities of practice that reflect and deliver knowledge to learners at a particular time of need.



Most importantly, this kind of blended eLearning model is derived from a clear understanding of the business objectives and how these can be translated into specific targets for human performance, which is often most dependent on two critical components: knowledge and skill. The learning, performance support, and knowledge management model acknowledges the fact that the basic categories of skill and knowledge are imparted differently. As a result, it focuses on optimizing the mix of classroom instruction, web-based online learning, and work place performance support to maximize the total impact on human performance.

The learning component of the blended learning model relies on blending classroom, asynchronous and synchronous eLearning, and on-the-job training to support the delivery and retention of the knowledge and skills needed to produce performance improvement. Similarly, the performance support component of

the model provides access to the knowledge base in the workplace—both before and during job performance—to help direct and guide task-based activities. Here, performance support activity can draw from elements found in learning or knowledge management, or those specifically designed for performance support. Each of these core components of the blended learning model can stand alone; however, when properly integrated, they form a powerful strategy for achieving performance objectives, creating consistent and predictable performance, and allowing organizations to efficiently and quickly convert new knowledge into practice.

Launching and Tracking Blended eLearning Solutions

Many organizational eLearning projects begin with the implementation of a learning management system (LMS), where a typical LMS can help with the launch and tracking aspects of training management, performance measurement, and a career plan of a learner's continuous development needs. Thus, a typical LMS-focused system should be able to track training activities, including completion of those activities, track the performance of the learner, track their assessment results, establish a learning plan or curriculum for learners, and allow learners to register for upcoming training events or self-service eLearning opportunities, such as a typical web-based training course.

Yet, there are many other critical functions that contribute to a successful blended eLearning strategy. For example, learners should have access to communities of practice where they can interact with their peers, mentors, and trainees to provide a high-level of social learning. The system should also be able to track tacit learning and individualized learning as defined by the learner. A knowledge management component to a system will allow this to occur, and the ability to launch a wide variety of eLearning activities will be central to an effective blended eLearning strategy.

It's also essential that the system can manage instructor-led classes; self-paced web-based training; real-time (or synchronous) eLearning sessions; access to discussion boards; best practices databases; assessments; communication tools like the now, chat, and instant message applications; curriculum maps and other learning resources, such as the web; audio and videotapes; books; magazines; journals; etc. This will allow the learner to self-select the materials that are most useful to him and also give the instructor or curriculum developer the most possible options for the delivery of sound instructional content.

There are also other elements of the infrastructure that are very important to the overall process of an effective blended eLearning system. For example, the definition of a synchronous learning tool or several synchronous learning tools will allow real-time classes and training. And some organizations are choosing to host these services internally, while others are choosing to address these needs externally through an Application Service Provider (ASP) model.

Learning Challenges and Applying Knowledge Within the Blended eLearning Model

In a more practical sense, all organizations seem to struggle to create blended learning solutions that optimize the mix of classroom instruction, structured on-the-job training (SOJT), and web-based learning. This process includes a thorough approach for conducting the planning, analysis, design, implementation, and evaluation phases relating to training interventions and can be applied to a full range of business situations, from basic course or curriculum conversions to development of a virtual corporate university.

Thus the blended eLearning development process must also include extensive criteria for making sound decisions on course content conversion, the level of student/participant interactivity, assessment, and testing/certification, as well as the media delivery strategies that will be used. Here, solid planning

ensures that a comprehensive solution can be created that satisfies a company's complete needs for rapid and cost-effective learning, performance support, and knowledge/content management. The learning component, in most cases, will support the delivery and retention of the knowledge and skills needed to produce performance improvement, for learning describes "how" information and knowledge are delivered to the learner. It draws its content from the knowledge base, which often includes predefined granules that a learning management system (LMS) needs to organize and present a blend of traditional training and eLearning interventions.

Learning has three phases:

- **Prior to job performance (training)**—This includes how to do tasks, how to use performance support, and how to participate in knowledge management practices. Its objective is to bring people up to a prescribed level of knowledge and skills.
- **During job performance (when actively doing the job)**—This includes structured on-the-job training (SOJT) and self-training using performance support. Its objective is to bring people up to a prescribed level of performance.
- **During job performance (when not actively doing the job)**—This includes participating in knowledge management. Its objective is to allow people to access and share the knowledge needed to exceed previously defined levels of performance.

"What" involves the knowledge being communicated, taught, learned, or applied and has a significant impact on "how" that material is best conveyed for maximum comprehension and retention within the organization. Embedded within the KM component of a blended eLearning solution are five basic catego

ries of knowledge that can impact performance: attitudes, concepts, skills, processes, and procedures.

- **Attitudes** are developed to help people make sense of, or interpret, other pieces of knowledge within the context of learning. Attitudes are often culturally based and strongly influenced by peer groups. Attitudes can be acquired and form the early part of organizational learning that is often thought of as change management.
- **Concepts** include generalizations and structures into which more detailed pieces of knowledge can be formed or housed to give them a context within the whole. Mental models, process flows, and knowledge taxonomies are all examples of concepts.
- **Skills** are the explicit capabilities individuals must have to support the execution of complex tasks.
- **Processes** are the inter-linking of tasks that lead to specific accomplishments.
- **Procedures** are the core knowledge elements that lead to performance improvement, the “how to” of job-related tasks. For example, to understand how to apply a procedure, the performer must have a working knowledge of its five essential aspects, including Why, Who, When, Where, and How. These five dimensions are not equally easy to communicate or learn. And becoming proficient in executing procedures requires the acquisition of both explicit (step-by-step) and tacit (experiential/judgmental) knowledge around each of these aspects.

Each of the basic categories of knowledge potentially contains a mixture of tacit and explicit knowledge. Explicit knowledge (e.g., how to make a photocopying machine produce multiple copies, collate the pages, and staple the results) can easily be put into a static knowledge base and used within a

performance support system, while tacit knowledge (e.g., what I've learned to do when the copier jams) can be extracted from subject matter experts (SMEs) through protocol analysis, what-ifs, and teachbacks before it is recorded into an explicit form. However, complex explicit knowledge (e.g., how does one keep a nuclear reaction “in balance”) poses such demands upon most people's information-processing capabilities that performance support technologies can be useful to augment people's limited memory capacity and information processing speed.

A sufficiently large knowledge base can also be useful in recording a model of the system plus its dynamics. In contrast, complex tacit knowledge (e.g., In making this decision, how do I ensure that Group A's interests are not perceived as having higher priority than Group B's interests, even though that is the case?) is not easily represented within a knowledge base, nor is such knowledge readily teachable, except in circumstances that foster mentoring and apprenticeship experiences. This is where the integrated nature of the blended eLearning model is most powerful. It can address the needs of different learners and performers at different times in their learning and performance life cycles.

Successful Blended eLearning Solutions

Because of their synergistic and multi-disciplinary nature, blended eLearning solutions often exhibit several key characteristics that allow them to dramatically and positively affect training and development activities. The following list describes several key attributes of an effective blended eLearning solution:

- **Formalized**—The solution is based on sound research and development in the field of adult learning and also reflects eLearning “best practices” industry.
- **Systematic**—The solution relies on a strong methodological and project management approach with measurable outcomes or predictive metrics.

- **Repeatable**—The solution can be widely deployed across disparate parts of the organization by a diverse work force with similar positive outcomes.
- **Scalable**—The solution is not prototypical but rather scalable to an enterprise-wide implementation.
- **Manageable**—The solution can be easily managed as an internal or outsourced training solution with strong ROI.
- **Adaptable**—The solution is not brittle and can accommodate a wide array of learning styles and organizational training contexts.
- **Standardized**—The solution uses standard approaches and measures for instructional design, outcomes assessment, and system interoperability, such as AICC and SCORM.
- **Integrative**—The solution synthesizes a variety of existing training models, typically involving other systems such as ERP and CRM.
- **Synergistic**—The solution combines the complementary elements of online learning, EPSS, and knowledge management to build a total solution that is greater than any of these technological approaches alone.

The Blended eLearning Decision Matrix

However, for all of this to make sense and to assemble an effective blended eLearning solution, the development team needs to make many careful decisions and look more deeply at the business and performance ramifications of each decision one makes. For this reason, we have created and included here a decision-support matrix for blended eLearning. This matrix is meant to be descriptive, not prescriptive, in that it allows developers and program managers to see what they have covered and what they may have overlooked in the way of a checklist.

Decision Matrix for ILT and eLearning Interventions

	Instructor-Led Training (ILT)	ILT/Virtual Asynchronous Classroom	ILT/Virtual Synchronous Classroom	ILT/Virtual Asynchronous & Synchronous	Virtual Asynchronous Classroom	Virtual Synchronous Classroom	Electronic Perf. Support Systems (W/EPSS)	Knowledge Management (W/KM)
Purpose	Instructor-Led Training improves the level of student involvement by direct interaction with instructor, interactions that include feedback, both verbal and nonverbal.	ILT with direct instructor-student interaction complemented by electronic communication for place/time shifting.	ILT with direct instructor-student interaction complemented by electronic real-time interaction for place shifting.	Synchronous and asynchronous delivery methods augmented by instructor-led training for physical learning components.	To provide group learning and communication and accommodate place/time shifting.	To provide collaborative learning in a real-time environment and accommodate place shifting.	To provide learners practical knowledge and problem-solving skills in a just-in-time format.	To deliver knowledge assets to the entire enterprise or to create a learning organization.
Types of Learning	Learners who prefer (or need) ILT are often novices who lack a conceptual learning framework. They may also find it difficult to grasp complex concepts that require instructor interpretations and explanation.	Uses ILT for conceptual framework then adopts VAC for less-structured problems.	Ill-structured learning but with a need for a conceptual framework up-front.	Learning model is similar to ILT but with attention to place-time constraints.	Less structured problems that require application, analysis, synthesis, and evaluation.	Ill-structured problems that require synthesis and evaluation of information and shared experience.	Ill-structured problems that require analysis and synthesis of elements, relationships, and organizational principles.	Used to reinforce a culture of sharing around communities of practice and experts.

Adapted from the work of Dr. Margaret Driscoll

	Instructor-Led Training (ILT)	ILT/Virtual Asynchronous Classroom	ILT/Virtual Synchronous Classroom	ILT/Virtual Asynchronous & Synchronous	Virtual Asynchronous Classroom	Virtual Synchronous Classroom	Electronic Perf. Support Systems (W/EPSS)	Knowledge Management (W/KM)
Roles of Facilitators, Instructors	Role of instructor is to provide flexible facilitation that supports learners' exploration of domain-specific topics or problems. This role draws upon instructor's real-life work experiences and use of pedagogical tools, such as simulation.	Readies students to transition from ILT to VAC, then adopts role of facilitator.	Provides conceptual framework and stays involved throughout the learning engagement.	Requires a multi-disciplinary approach that offers facilitation, mentoring, and performance observation.	Facilitator of Group Learning: guides instruction, provides resources, evaluates outcomes, and communicates with learners.	Coordinator of Learning Experience: participates as a co-learner, recommends learning direction, but does not determine direction or evaluate outcomes.	Organizer of Content: locates, analyzes, abstracts, indexes, and classifies information into learning modules.	Serve as experts and COP moderators, and CKOs can guide the knowledge transfer and learning practices.
Roles of Learners	Learners are encouraged to learn from one another, as well as from instructors, through projects, case studies, and in-class exercises, where new knowledge and skills will allow them to perform at a higher level.	Learn concepts from ILT, then become independent learners using VAC.	Learn concepts from ILT, then transition toward more dynamic interactions.	Active in initial asynchronous engagement then engaged in ILT for simulation and hands-on; then use synchronous for follow-up work.	Guided by facilitator as an individual or as a member of a group; participates in instructional activities; and receives feedback.	Active participant in a collaborative learning process with facilitator and peers, participates in dialog and reflects on experience.	Takes initiative to direct own learning; determines level of detail; and assesses success of instruction.	To gain valuable knowledge by interacting with mentors and others with greater job experience.
Methods	ILT draws upon lecture, discussion, and collaborative learning strategies such as brainstorming, discussions, and problem-solving to achieve its goals.	Classroom instruction blended with asynchronous learning to accommodate place-time constraints.	Transition from ILT to online discussions and problem-solving that require real-time learning and collaborations.	Pre-work is often VAC, followed by ILT and VSC learning components.	Experiential tasks, group discussions, team projects, self-directed learning, discovery method.	Dialog and discussions, problem-solving, and maximum interaction.	Problem-solving, scientific method, experimental method, project method.	Communication, discourse models, mentorship, teaching.

Adapted from the work of Dr. Margaret Driscoll

	Instructor-Led Training (ILT)	ILT/Virtual Asynchronous Classroom	ILT/Virtual Synchronous Classroom	ILT/Virtual Asynchronous & Synchronous	Virtual Asynchronous Classroom	Virtual Synchronous Classroom	Electronic Perf. Support Systems (W/EPSS)	Knowledge Management (W/KM)
Interactions	Multimedia, simulations, application exercises, whiteboards, in-class communication with instructor	Classroom multimedia, hypertext, hypermedia, bulletin boards, web/CBT, e-mail, listserv	Classroom, multimedia, whiteboards, web conferencing	Classroom, multimedia, hypertext, hypermedia, bulletin boards, e-mail, conferences, listserv, simulation, e-mail, exercises	Multimedia, hypertext, hypermedia, bulletin boards, notes conferences, modules of web/CBT, e-mail, access to facilitator and peers	Synchronous audio- and video-based conferencing, shared whiteboards, shared applications	Multimedia, hypertext, hypermedia, bulletin boards, notes conferences, modules of web/CBT, e-mail, access to facilitator and peers	Story telling, document sharing, profiling, searching
Media Type Selection	Print media, PowerPoint, Presentations, simulation	Print, video, hypertext, CD-ROM, simulation, stand-up instruction	Print, video, simulation, stand-up instruction, audio conferencing, teleconferencing	Print, video, hypertext, CD-ROM, simulation, stand-up instruction, audio conferencing, teleconferencing	Video, hypertext, CD-ROM, simulation, audio conferencing, teleconferencing	Video, hypertext, simulation, audio conferencing, teleconferencing	Video, simulation, hypertext, online job aids, e-mail	Threaded discussions, documents, COPs, intelligent agents
Assessment Mechanism	Paper-based assessments, individual evaluation of participants, and performance-based assessments	All of ILT, plus effectiveness of web-harvesting techniques	All of ILT, plus effectiveness of web-harvesting techniques	All of ILT, plus effectiveness of web-harvesting techniques	Web-based testing/exams, individual evaluation of participants, performance-based assessments	Individual evaluation of participants, level of participation	Proper execution of given tasks, performance-metrics appraisal	Problem-solving ability, community involvement, effective knowledge transfer

Adapted from the work of Dr. Margaret Driscoll

Applying the Decision Matrix for Blended eLearning

To use the matrix on pages 78 through 80 effectively, one needs to look at the immediate needs and future potential of a blended eLearning solution, and not only at its component technologies, for there are many elements of a blended eLearning infrastructure that may or may not come into play over time as the team assembles the actual delivered system. What is certain, however, is that each cell in the decision matrix represents a single descriptive element or component of a total blended eLearning solution and carries with it a cost factor and success indicator from a learning point of view.

So the best way to use the matrix is to see it as a checklist of sorts that can be reviewed from time to time during the strategy selection and building processes. For example, the matrix will allow decision-makers and developers to test the “right fit” of their blended eLearning model with their current business objectives. In other cases, it might help the team see the role of “augmentation” in moving from one delivery approach to another, especially when the “blend” includes some form of instructor-led training. Alternatively, the matrix may also be used as a migration planning tool as one works from left (completely ILT-based learning) to right (a total virtual learning environment) in creating the most effective blended eLearning solution over time. And finally, even a cursory scan of the matrix that attempts to define the targeted or desired “blend” on the horizontal axis and then reveals the areas impacted on the vertical axis will give decision-makers a much better idea of the complexity of the overall solution and the development work that lies ahead.

To use the matrix in a practical sense, an effective strategy might be to simply copy it from the book, select the type of blended eLearning solution at the top that is being sought, and then color in or highlight the cells that represent either up-

coming work or major areas of impact. In this sense, the decision matrix will have served as a “road map” of sorts that helps keep the development team and business owners aligned on all of the decision points and impact areas that need to be addressed. Undoubtedly, understanding what type of blended eLearning is the best or “right” solution, and in what measure to deploy it in a total blended eLearning solution, requires a framework for analyzing the complex criteria and learning options that are available. And if the blended eLearning model within your organization can be best described foundationally as the combination of traditional ILT approaches with eLearning that promotes performance improvement and effective knowledge transfer, then the matrix may simply be a validation or internal selling tool that will help expand everyone’s point of view.

Blended eLearning Solutions as a Process

The decision matrix on pages 78 through 80 also allows developers and business owners to see that blended eLearning really is a process and not simply an implementation option. And in fact, most people who work in the area of training and development believe that learning in general is a process—an ongoing experience involving the delivery of learning events across time and space. But as we have shown, blended learning also refers to a type of learning process that combines multiple delivery methods and technologies toward a common goal. And because more methods of delivering learning are available today than ever before, conscious choices that are not necessarily vendor-driven have to be made.

What’s most important in all of this, however, is that the lines between the various approaches (and their related technologies) are not sharply drawn. So just as Webster’s Dictionary defines blending as the ability “to pass or shade imperceptibly into each other,” it is hard for us to distinguish where learning leaves off and where performance support begins—and of course how both of these approaches constantly draw upon the man-

agement of knowledge. Thus, the technological goal of blended eLearning is building a completely integrated eLearning solution, which purposefully and imperceptibly combines learning events from diverse delivery methods throughout the learning process. And since it would be impossible for any single system to fulfill the combined promises of OLL, EPSS, and KM, we are fortunate that the eLearning industry has now provided us with a vast array of delivery methods and technologies that meet today's complex training and learning needs.

However, combining these technologies alone will not ensure success. Multiple delivery methods do enable the creation of powerful solutions, but they still require a purposeful approach to the selection, coordination, and implementation of these technology-driven options. In fact, it turns out that the key to successful blended learning lies in the following:

1. Selecting appropriate delivery methods for specific learning outcomes, and
2. Effectively combining diverse learning events and interventions into a holistic training and development program based on a blended model.

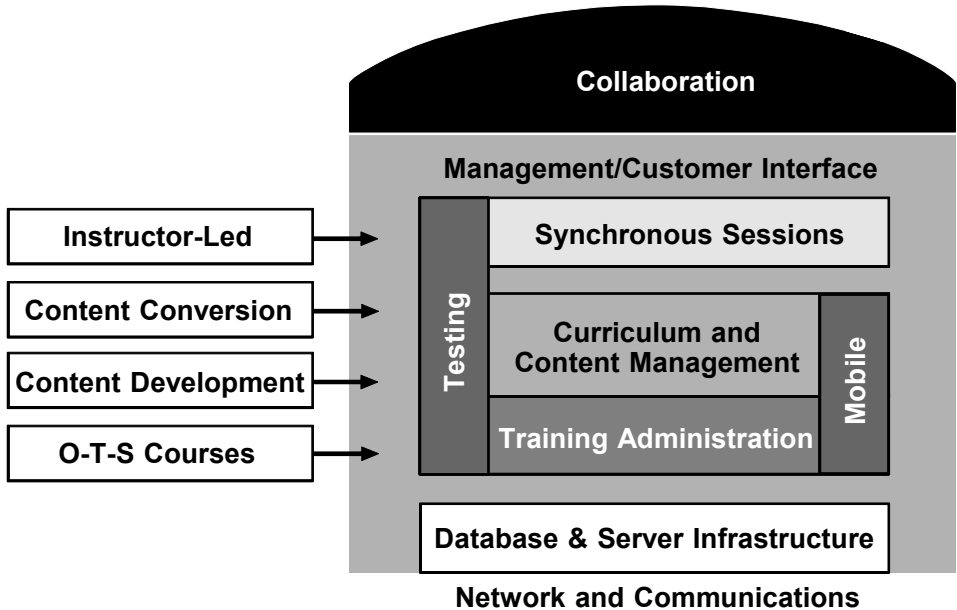
Much like pharmaceutical development, blended eLearning is about combining elements or compounds in the correct way to produce a desired reaction. Effective blended eLearning requires proper execution because we cannot expect the inclusion of multiple elements alone to yield optimal results. The trick is to find and execute the right formula. Because disparate learning needs may not require the same formula, eLearning leaders need to be in the business of continuously creating new mixes and blends. We must also recognize that the learning process is composed of many learning events and discrete learning elements, and multiple delivery methods can be implemented for any given element. These methods can include formal learning experiences that accomplish a specific learning objective (such

as synchronous or asynchronous course delivery), but informal learning experiences can also contribute information that supports a specific learning outcome.

So if learning is truly a process, and current delivery capabilities can provide a rich blend of experiences throughout that process, then designing a blended eLearning solution is a complex undertaking with multi-dimensional considerations. Yet, there are no optimal blends or mixes, and no decision point referred to in the matrix is inherently more important than another. The key is to determine which considerations are most critical to a particular training need and then examine the options and make informed choices. By considering various factors and applying established decision points, the effects of each delivery method can be maximized to create a robust learning solution. The right blended eLearning formula creates a powerful reaction, and there are many formulas to be created.

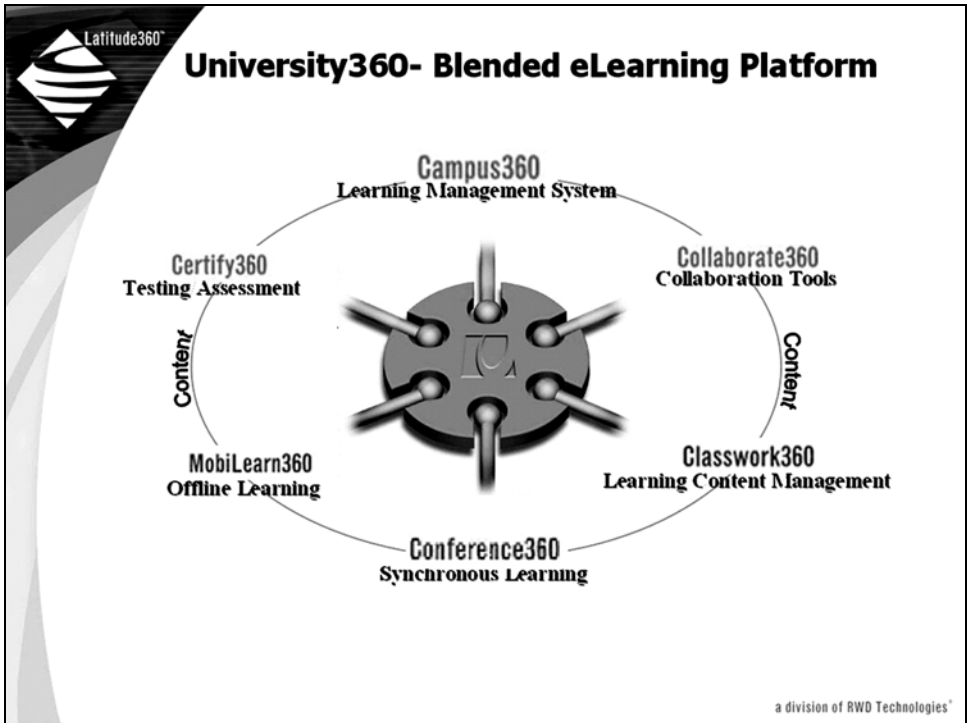
Case Study: University360

Early in 2001, Latitude360, a division of RWD Technologies, introduced **University360**, which is a fully hosted eLearning platform that comprises a comprehensive suite of online learning components and value-added business services. The corporate learning/training infrastructure upon which **University360** is built is depicted in the graphic below.



© Copyright 2001 Latitude360™ a division of RWD Technologies®

Regardless of the learning content sources, a common set of interconnected hardware and software system components are used to achieve a full-featured online learning environment. **University360** provides this level of integration through a Message Broker architecture in a hub-and-spoke model that offers a unified log-in to each of its online learning components, which perform discrete functions (as depicted in the graphic on the following page).



Each component of **University360** is derived from a “best-of-breed” eLearning technology so that the overall system can minimize the risk associated with creating an in-house corporate university system. Moreover, **University360** within an ROI model can be delivered and appropriately priced at a component level within an ASP model, thereby limiting up-front investments. While each implementation of **University360** can be thought of as a “virtual campus” within an organization, its components can be delivered and evolved separately as time and resources permit.

The Components of **University360**

Campus360™ is built upon RWD’s own Learn360 LMS or optionally the Saba Learning Enterprise, an industry-leading LMS. Both Learn360 and Saba’s LE architecture can dynamically build courseware catalogs, schedule instructor-led or online courses, manage accounts relating to finances, expenses, and internal charge-backs (including linkages to ERP and eCommerce systems), and track enterprise-wide learning objectives,

which can include instructor-led training, self-paced instruction, and web-based eLearning. Campus360 is also highly scalable to meet the changing demands of extended enterprise learning and includes a layered security system, managed approval processes, and electronic signatures.

Classwork360™ is built upon WBT's TopClass eLearning content management system and is tightly integrated with Latitude360's value-added configuration, content development, hosting, and integration services. TopClass is a feature-rich embedded CMS technology within University360 that reflects an "open standards" modular architecture. In addition, TopClass leverages the full power and flexibility of learning-object technology to rapidly build, manage, and deploy asynchronous courseware in rapidly changing eLearning environments.

Certify360™ is powered by Latitude360's own CertificationNet product and offers web-based examinations, assessments, and surveys. Certify360 ensures that exams not only test a user's understanding of products or processes, but it also measures the application of their understanding. These online testing and certification components can be accessed from both the Internet and intranets, thereby offering an assessment and certification infrastructure that supports diverse database system integration, complete course evaluations, and participant tracking. Certify360 also provides secure test registration and reporting as well as assessments that include detailed psychometric reports on examination instruments.

Conference360™ is powered by a choice of Centra, Interwise, or Placeware live eLearning products to offer synchronous virtual classrooms that support blended instructor-led training and eLearning delivery methods by offering rich media content and system integration with the other University360 components. These services are offered on a 7x24 basis and hosted at Latitude360 with dedicated, secure, peer-based ISP access. Configuration, training, documentation, and support services for Conference360 are all offered within the ASP hosted model.

Collaborate360™ is the messaging component of University360 and is powered by Akiva's WebBoard. WebBoard is a web-based resource for disseminating team or group-based information and building communities of practice through discussion threads within both asynchronous and real-time learning environments. WebBoard's "virtual boards" can be used as

places for virtual conferencing, providing information and support to both employees and customers, or promoting discussions centered on product development and support. Each virtual board or forum can contain an unlimited number of “conferences,” which are topic-based discussion threads that can hold text messages, rich media file attachments, and URL links. WebBoard complements the Classwork360 component and thereby accommodates place-time shifting for asynchronous eLearning activities.

MobiLearn360™ offers the option of delivering University360 content and assessment components in an off-line mode. Fitting the needs of a mobile work force or employees who wish to work through eLearning modules while not connected to the net, MobiLearn360’s off-line delivery functionality is achieved through the integration of software synchronization components owned by RWD and branded as 360Sync. MobiLearn360 enables learners to download web-based courses to a hard drive and use them off-line with full functionality in a mobile learning environment with remote testing, digital signature capability, and full synchronization occurring once a connection to the Internet/ intranet has been re-established. In doing so, MobiLearn360 offers companies a way to deliver media-rich, fully mobile eLearning content without having to create or maintain high-bandwidth connectivity pipelines.

Blended Learning Through *University360*

University360 offers several eLearning content development and delivery strategies that focus on business and learner performance improvement, thereby helping organizations ensure a maximum ROI when implementing eLearning technologies. The *University360* approach offers an effective blending of:

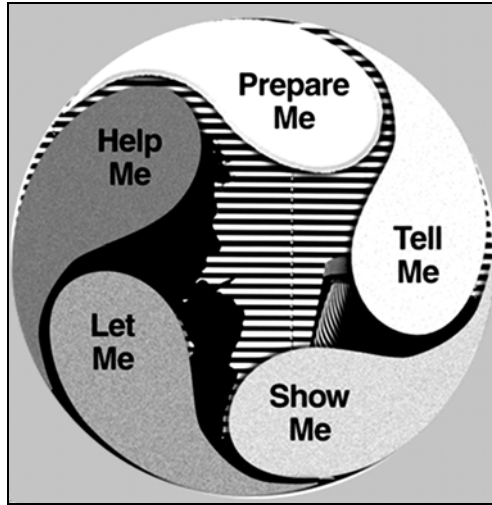
- **eLearning**—Web-based, live, real-time, or just-in-time self-paced instruction
- **Online Performance Support**—Job specific, work place resident, context-sensitive, embedded performance support tools

- **Knowledge Management**—Knowledge assets maintained at their source and deployed for multiple business purposes

This kind of performance-based content development and deployment helps companies create eLearning solutions that optimize the mix of structured on-the-job training and web-based online learning. This approach also includes a rigorous method for conducting the planning, analysis, design, implementation, and evaluation phases relating to eLearning content development and management in a range of business situations. Latitude360 has also developed robust decision-support and rapid-development tools to aid in making sound decisions on course content conversion; in determining the appropriate level of student assessment, testing, and certification; and in reaching the optimal mix of media delivery strategies.

The Adult Learning Model and Content Development

University360 implementations also draw upon *Latitude360's* process-oriented adult learning model, which acknowledges that, since every eLearning content creation or conversion process is different, an effective and efficient needs analysis is vital to providing a basis for a flexible eLearning program design and a forward-looking system implementation. Latitude360 can facilitate this kind of content development phase by applying the adult learning model as shown in the graphic on the following page.



Courtesy of RWD Technologies®

Chapter 5

Instructional Systems Design for Blended eLearning

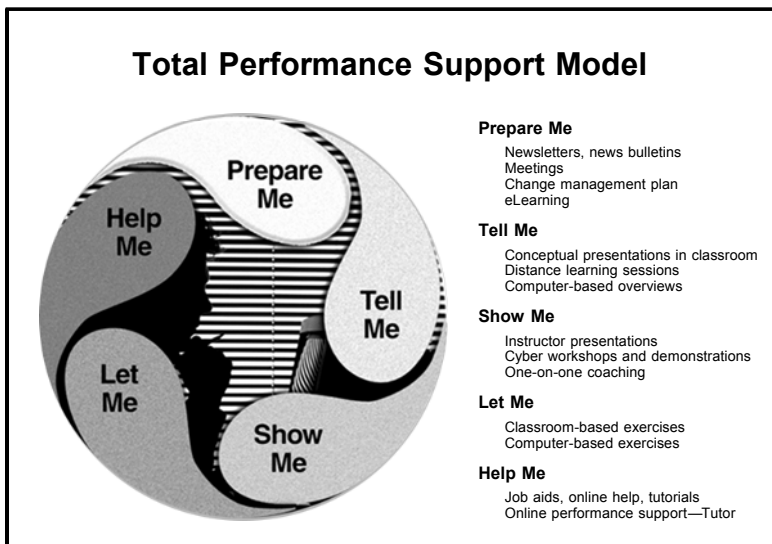
Overview of ISD Approaches

To fully realize the benefits of blending *learning*, *performance*, and *knowledge*, a rich infrastructure and quality content are not enough: a solid Instructional Systems Design (ISD) that is effective for intended audiences is also imperative. And, in fact, ISD is expanding in many organizations as performance and knowledge are being integrated into the traditional “objectivist” models that have pervaded existing eLearning and CBT courseware to date. In this chapter, we’ll explore some of the theories and methods that can be applied to Blended eLearning ISD designs, as well as examples of marketplace tools that can assist with the implementation of solid and appropriate ISD objectives. Understanding the goal of the training and the final outcome is critical to achieving the expected results from a learning program, no matter what ISD approaches or theories may be behind it. But first we need to look at the traditional objectivist model of instructional development before delving into other complementary theories.

Traditional ISD has followed several models that have proven highly effective for teaching and learning in a variety of disciplines, both in the classroom and online. Models such as the “Component Display Theory” from David Merrill, the “Criterion Reference Model” from Robert Mager, and “Goal-Based Scenarios” from Roger Schank have all shaped the traditional design models most commonly found in CBT and asynchronous WBT.

However, content developers will find that as they begin to blend delivery methods, a variety of learning modalities are also available, and here several learning models may be blended, just as courseware delivery models are often blended. This issue becomes even more complex as we begin to add models that go beyond training and instruction into core knowledge and performance models that sometimes do not even look or feel like training. Plus elements of change management and performance support can and often do shape and influence the overall curriculum design for an individual module, course, or an entire series of courses. Knowledge management can shape the baseline archiving and retrieval of information that can be put into a learning context. Below is one proprietary example of how these theories might come together to form a practical model that begins to expand into the areas of blended learning, performance, and knowledge.

Case Study: The RWD Technologies® Total Performance Support Model



Courtesy of RWD Technologies®

Prepare Me

Prepare me corresponds to the change management and awareness activities in the learning process. This can take on the change communication (e-mail, newsletters, change management activities) and pre-work before a learning event.

Tell Me

The actual learning event usually starts with an introduction to concepts and information. This can take the form of in-class presentations, distance learning sessions, or computer-based overviews. Some of these concepts might have been introduced in pre-work, but reinforcement is necessary to promote full understanding and to provide enough baseline knowledge for the learner to understand what they will see and do.

Show Me

For adult learners, it is not enough to tell them something without context. Showing it to them, particularly if it is a process or procedure, is the next logical step in understanding. Demonstrations can be performed in the classroom, on video, or online through simulation, screen recording, or movie files. Sometimes the simpler solution of one-on-one coaching and personal demonstration can be even more effective in promoting understanding. For most people, it is still not enough to just see a process or task performed and be expected to know it. It must also be practiced.

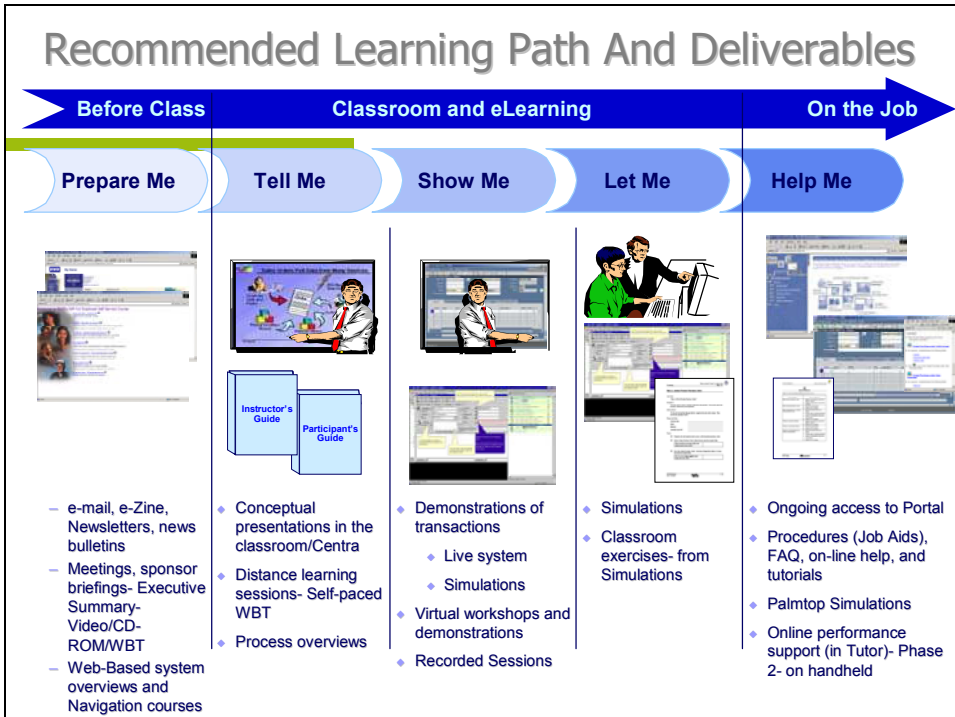
Let Me

Performing the task provides the practical, hands-on activity needed to perform a task effectively. Sometimes this is on live systems or involves the actual process in conjunction with a mentor or personal instructor. In the context of eLearning, it is often in the form of simulations, scenarios, or practical exercises. Computer-based (or web-based) practice can be particularly effective because of the personalized timeframe that can be devoted by each person until he or she feels that they have attained an appropriate level of mastery. Once mastery has been achieved, it is necessary to maintain the newly gained skill.

Help Me

If a skill is not used right away, it is easily lost. To maintain, or reinforce, knowledge and skills, ongoing performance support can be provided. For example, job aids (online or paper-based), help desk, online help,

collaboration tools, and online performance support modules can all enhance performance, even if details of a process or skill are not remembered in their entirety. The following example shows the interventions in a logical path of action, with sample deliverables.



Courtesy of RWD Technologies®

This is just one example of a learning model or approach that has the flexibility to accommodate learning, performance, and knowledge solutions. Based on the needs of the learner, the environment, and the type of information, a blend of more than one model might be more appropriate. The following section outlines some of these models and provides examples of how they can be used whether independently or added into an existing learning plan and approach.

Additional ISD Theories that Can Actualize Blended eLearning

Adult Learning Theory

Patricia Cross is credited with presenting a viable, heuristics-based model on how to provide effective instruction for adults. She promotes the following four core principles:

1. Adult learning programs should capitalize on the experience of participants.
2. Adult learning programs should adapt to the aging limitations of the participants.
3. Adults should be challenged to move to increasingly advanced stages of personal development.
4. Adults should have as much choice as possible in the availability and organization of learning programs.

These principles can be applied to blended learning by providing a self-service approach to learning and providing many activities that allow learners to build upon their previous experience, or contribute to a group in a collaborative fashion. The self-paced, self-service model is particularly appealing in light of the fourth guideline. Giving responsibility for the learning activity and changing the locus of control to the learner, rather than an external force (like an instructor) can make way for other theories that are closely tied to the adult learning theory from Cross.

Androgogy

Closely tied to the Adult Learning Theory is Malcolm Knowles' "Androgogy" model. This model is also an attempt to describe the principles of how adults learn, rather than how children learn (which is generally referred to as pedagogy). The core tenants of this philosophy are as follows:

1. Adults need to be involved in the planning and evaluation of their instruction.
2. Experience (including mistakes) provides the basis for learning activities.
3. Adults are most interested in learning subjects that have immediate relevance to their job or personal life.
4. Adult learning is problem-centered rather than content-oriented.

The practical implications for this model include the need for self-service that is goal-based and allows for a certain amount of planning of learning activities in relationship to larger goals like career planning and measured skill tracking (certifications, matriculations). Online access to human capital development in management (HCDM) information can be a primary motivator for adults.

Additionally, experiential learning can be achieved in the blended model through the use of role-playing and simulations that allow the learner to take a problem-oriented approach and also to provide real-world relevance. Allowing for mistakes and trial and error can also help reinforce learning. A simulation of a software product's operation can keep these mistakes from having costly impact to systems or the business processes they support.

Goal-Based Scenarios

Another great thinker and practitioner in this area is Roger Schank of Northwestern University and Cognitive Arts, Inc. Among his many theories is the idea that the best learning is often through a scenario that has a specific goal attached. If the scenario is realistic to the final outcome, a significant effect can be the full immersion of the learner into a required role leading to the expected outcomes.

This process turns the normal “show, do, test” process upside down. The beginning is a realization of an activity that will test the learner, and a series of activities that must be done. If they can be performed without assistance, great. Most likely, a learner will need to resort to gathering additional information, or having someone provide corrective feedback to show the learner how to perform a task.

An excellent example is found in a Cognitive Arts web-based training course for Columbia University. In the course, the learner assumes the role of a caseworker who must manage the individual profiles of students, observe their behavior, and report back to management and parents about the activity observed and its implications. Soft-skills are integrated with the actual task-based activities that must be accomplished to provide a very compelling experiential learning module that represents the Goal-Based Scenario model.

Constructivism for Learners Who Are Familiar with a Knowledge Domain

Not all learning starts from a zero knowledge base. As learners progress in their careers or given disciplines, they generally have a great deal of prior knowledge to draw from. This can help learners follow a discovery learning model where more “trust” can be placed on the individual to find the information he or she might need. Let’s look at several theories that support this overall concept.

Constructivism

Basing new ideas and exploration of knowledge on existing knowledge is a core tenant of Bruner’s Constructivist Theory. The process is sometimes called discovery learning. Constructivism as an approach is most effective when there is a high-context culture that has previous knowledge, or analysis skills to derive a final result from a hypothesized approach. The

experimental nature of this approach makes it ideal for research-oriented knowledge domains and the sciences.

It is also possible to address the needs of a sophisticated audience that is a subset of a larger group, with less experience. Providing an alternate method for accessing information (perhaps contained in a course) can give advanced learners quicker access to needed information. As an example, a simple search engine that allows the learner to “jump” right to the section of interest could help promote ongoing performance support and also appeal to those people with enough experience to know what they need and to go out and find it. The ability to have the learner participate in the process saves valuable time by making their base need the innate, unspoken learning objective. The online testing or validation is the timely, and accurate discovery of the required information. This approach is more closely tied to concepts and knowledge than performance-oriented practices.

Cognitive Flexibility Model

A companion theory that is often lumped under constructivism is Rand Spiro’s Cognitive Flexibility Theory. Many experts and subject matter experts learn best using this learning theory. The reason is that it was built with complex, ill-structured domains of knowledge in mind. Examples include fast-changing fields like medicine and high tech as well as aerospace. Often times this theory manifests itself as a concept map that can be viewed from many different starting points, depending on the experience of the learner and what she is looking for. The model is often for ongoing knowledge exchange.

Examples like Google’s relevancy rating system and the GroupLens collaborative filter for Amazon’s book “recommender” allow for relevancy ratings based on previous history from an individual’s profile as well as the preferences of others with similar profiles and buying characteristics. While these tools are seldom thought of as learning resources, they are perfect examples of tools that help people who already know something about

the knowledge domain and can use that context, combined with dynamic information that the computer calculates, to derive a result in a very timely fashion.

For most practical purposes, online rating systems, concept maps as a navigation structure, and advanced search and retrieval capabilities in complex knowledge domains are the main examples of this theory in action. Collaboration can also play a role in assisting with the personalization of the singular learning/discovery event.

Collaboration Models

Further study of collaboration leads to several other theories and activities of early practitioners. There are many tools to help facilitate collaboration, but without a good theoretical base and practical approaches to back up the technology portion, most systems will sit dormant. First and foremost, there must be a compelling reason to collaborate for it to be effective. Contrived collaboration is easily seen through and impossible to maintain. Going back to a credible research base can help solidify the need and approach.

The “Cooperative” Learning Theory

Drs. David and Roger Johnson of the University of Minnesota have spent years developing a sophisticated, validated model for cooperative learning. Some of their core tenants are as follows:

It is only under certain conditions that cooperative efforts might be expected to be more productive than competitive and individualistic efforts. Those conditions are as follows:

- Clearly perceived positive interdependence
- Considerable promotive (face-to-face) interaction
- Clearly perceived individual accountability and personal responsibility to achieve the group’s goals

- Frequent use of the relevant interpersonal and small-group skills
- Frequent and regular group processing of current functioning to improve the group's future effectiveness

All healthy cooperative relationships have these five basic elements present. This is true of peer tutoring, partner learning, peer mediation, adult work groups, families, and other cooperative relationships. This conceptual 'yardstick' should define any cooperative relationship.

Examples like these abound regardless of the technology used, but discussion boards, instant messaging, peer2peer systems as well as e-mail, instant messaging, and voice and video conferencing have all proven effective in promoting these conditions. Facilitated asynchronous and synchronous learning both benefit from and enhance or validate this theory.

Communities of Practice

Etienne Wenger is perhaps the best-known advocate of communities of practice in the digital age. He writes, "Since the beginning of history, human beings have formed communities that accumulate collective learning into social practices—communities of practice. Tribes are an early example. More recent instances include the guilds of the Middle Ages that took on the stewardship of a trade, and scientific communities that collectively define what counts as valid knowledge in a specific area of investigation." These communities can be brought to life through modern technologies that help span time and distance to bring people together to share, even if they would not normally have access to each other's knowledge or interaction.

Rena Palloff and Keith Pratt also contribute significantly to communities of practice in their excellent books *Building Learning Communities in Cyberspace* and *Lessons from the Cyberspace Classroom: The Realities of Online Teaching*. While much of the information focuses on communities in academic

environments, key heuristics as well as their findings have direct application in corporate and general learning environments.

Communities of practice can be incorporated into a core curriculum that consists of self-paced, asynchronous web-based training. This augmentation has proven to increase retention and connection with the course of study. It can also be used to build an ongoing base of information that goes beyond the core information found in the “canned” materials. Group activities can serve to unite people and form bonds that transcend technology and provide additional avenues for learning from experts, peers, and distributed practitioners.

Developing Content for Combined Learning Models

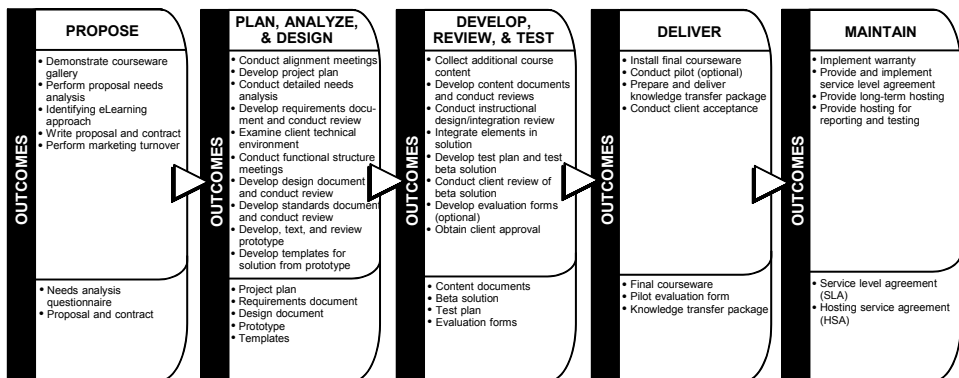
There is no one correct theory that can be applied across the board to give you the correct outcomes within your blended solution. The previous section has provided you with a core model and additional models that have proven effective in certain contexts. The following sections will provide you with details about the development tools that can be used to develop modules, courses, curriculum, performance elements, and knowledge assets.

As an example, regardless of the tool used, a course might have several contexts for entering and navigating through the content. If you can design for this using an appropriate tool, you can save significant time and money in the development of materials that can meet a variety of audience needs. One instance was a laboratory safety course that had to meet the needs of summer intern lab technicians and researchers who had been working in labs all their lives. There was a compliance test at the end of the training. To meet the needs of both groups, two separate domains were created, within one learning environment, with one core base of information. The first model was very objective-oriented and guided the learner through

everything they needed to know, step-by-step, objective-by-objective. Another domain was linked under resources. For the Ph.D. researchers, a constructivist-based search engine was set up, and they could easily look up the specific information for this lab that was different from the other lab environments. Each group could get what they needed to pass the compliance test and ensure successful safe operation. Such examples are common, but many other approaches could be created through the effective combination of learning theories like the ones listed in the above sections.

Now let's look in depth at one ISD model used by RWD Technologies[®] and then at three unique ISD-oriented courseware development tools in the marketplace that can be used to develop content that combines several of these theories and methods.

A Sample ISD Methodology— RWD iVision™



Overview

RWD Technologies[®] focuses on improving human performance in high-technology companies by meeting the needs of end users. To meet these needs, RWD has developed a variety of solutions involving training, documentation, and online performance

support systems. For each type of solution, RWD captures best practices and applies them to future solutions.

Browser-based solutions deployed over the Internet or corporate intranets improve the ability of companies to manage course content and to deliver training, testing, and student tracking to geographically dispersed audiences. Generating high-quality eLearning solutions opens new business opportunities but also presents design, development, and project management challenges. RWD has created a systematic process, the RWD iVision™ methodology, to take advantage of these opportunities and meet these challenges.

Applicability

RWD iVision™ is designed to work in conjunction with other RWD methodologies, such as RWD Performance Vision and RWD InfoVision, that apply to other performance support materials that are part of a blended eLearning solution, such as job aids, quick references, synchronous delivery, and online performance support systems. RWD iVision™ applies to the asynchronous content in the blended solution.

Because eLearning is a complex compilation of instructional design, content, multimedia components, and technical requirements, early and continuous client involvement is even more crucial than with standard paper-based training solutions. For this reason, RWD iVision™ includes numerous approvals from the client, and each phase of the process includes key tasks to ensure sound project management, high-quality deliverables, and full client satisfaction.

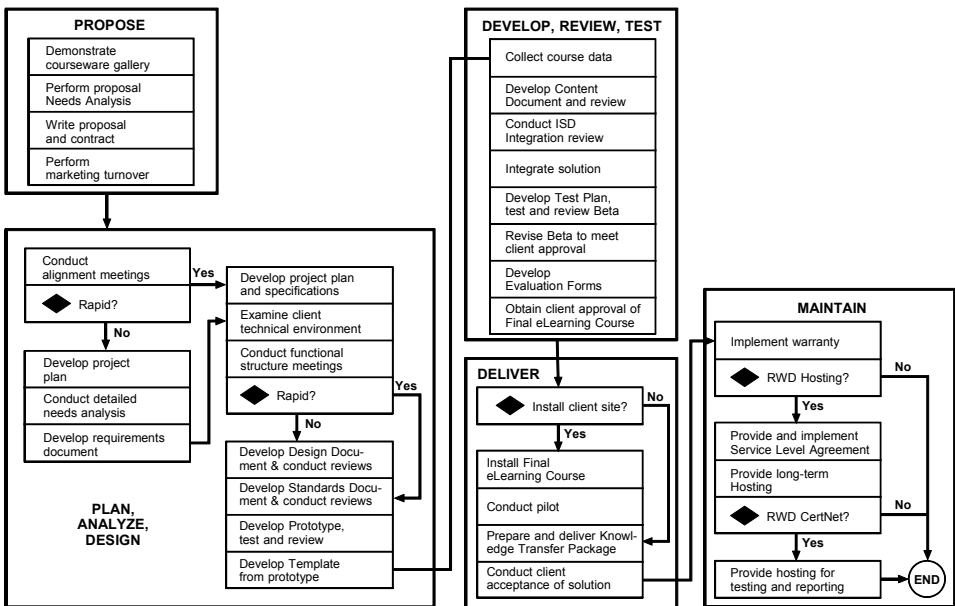
RWD iVision™ Process Flow

While the RWD iVision™ methodology provides specific guidelines for the eLearning development process, it is designed to be flexible. Although most tasks are required, some are optional. Depending on the scope, schedule, and nature of the specific eLearning solution, a project manager may choose to follow

either a full or a rapid development process. It should be noted that the rapid process requires the same tasks but, because it is typically used for smaller, less complex projects, some tasks are performed in parallel and combined into one deliverable.

The figure below presents a high-level process flow showing the key tasks and decision points of the methodology.

RWD Technologies® iVision™ Process Flow



Case Tool #1: Web Course Builder (Source: ReadyGo)

ReadyGo offers Web Course Builder—WCB, an eLearning authoring tool designed for content experts. ReadyGo believes that the reason why so few web courses are being produced is because the tools available are too difficult for the content expert. WCB uses “content expert” to denote a trainer, product manager, project manager, or other employee who needs to transfer their experience and knowledge to other employees, but who does not have a background in computer programming or use of sophisticated computer software. Without tools designed for the content expert, ReadyGo believes that eLearning will become a specialty niche, when it could become a core component of business.

Think back to what it was like to create presentations in the 1980s. Only those organizations that could afford to have professionally produced materials had presentations that were more than word-processed transparencies. When tools like PowerPoint became available, everyone had the ability to create presentations that looked professionally produced. The same need exists in today’s business world with respect to distance training. Content experts need a tool that enables easy production of professional-looking eLearning courses. When ReadyGo decided to create the Web Course Builder, we interviewed people from over 200 companies. Our goal was to clearly understand how content experts work and to identify corporate trends for training and web use. This information depicts the architecture of WCB.

- Almost all content experts ReadyGo interviewed told us that they do not create their own graphics. Rather, they rely on an artist. We decided not to include a graphic design tool within the WCB, and instead focused on providing easy methods to import and integrate any type of web-viewable graphics into courses.
- ReadyGo found that if we gave content experts a blank screen and asked them to create a course (especially with something new like eLearning), they got stuck at the layout phase, and never progressed to the content creation phase. Therefore, ReadyGo decided to base the tool on templates so that content experts can immediately start creating courses.
- ReadyGo had the choice of developing a WYSIWYG (What You See Is What You Get) interface or a dialog box interface. We decided to build a dialog box-based interface:

- With a WYSIWYG authoring tool, there is an expectation that the layout created by the author will be exactly how the student sees the content. This conflicts with one of the main benefits of web browsers: Each person can control the size, shape, and font the browser displays. Since students can modify their environment, it is probable that the environment a course designer uses during development is not the same as that on the student's desktop. For course creators to be able to control the student desktop, they will either need to create a plug-in to display the course or they will need to capture the page as a single image (GIF, JPEG) like PowerPoint does. Use of a plug-in adds an additional level of technical complication in serving a course. Creating an image to capture the page means slow downloads and negates many of the benefits of the web including the ability to search documents for Knowledge Management. The decision was to implement dialog boxes instead of WYSIWYG. This provides the course creator with a structure into which their content can be placed. The ReadyGo Web Course Builder takes the content and produces standard HTML that which the student's browser can optimally display.
- An additional benefit of using a dialog-box-based authoring tool is that the advanced user can easily drop in any HTML/XML/JavaScript into the template. This extends the ReadyGo WCB into an eLearning container. For advanced users, the tool automates tedious tasks such as linking pages, building indexes, moving pages, and making sure all the links work; while providing the flexibility to use anything that is web readable wherever the course creator sees fit.
- With a WYSIWYG tool, course developers must hunt through multiple pull down menus to access desired capabilities. Research found that content experts who were not constantly using the WYSIWYG tool quickly forgot which features were available and became confused by the naming structures found in the pull down menus. The WCB solution was to include function buttons on the input dialog boxes. This way content experts are always aware of which

features are available (and appropriate) for the particular page/task because they have easy, intuitive access to those tools.

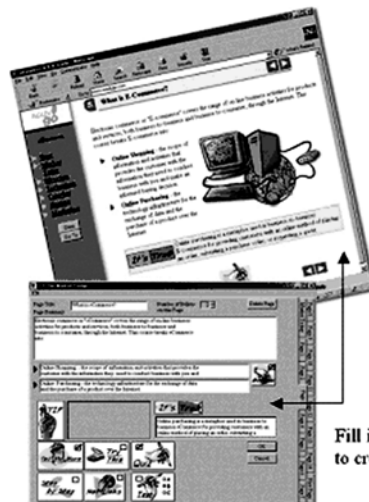
- There are, however, a few limitations to the approach. ReadyGo's dialog-box-based input screens are more constrained than WYSIWYG tools, but we feel that the ease of use and speed of development compensate for this. With a dialog-box-based solution, course developers are given a standard, proven structure to create eLearning courses. They lose the ability to move any feature to any location on the page, but this is a capability needed primarily by advanced graphics designers. We do give course developers the ability to move the layout of graphics, replace any of the stock navigation graphics, change color schemes, modify automatically generated text (e.g., score your test), and easily add any drill down features (e.g., articles, tests, quizzes, exercises, links). These capabilities satisfy most of the content experts.
- ReadyGo found that PowerPoint is the corporate education tool of choice for most companies. When PowerPoint is saved for web use, each page is saved as a graphic, making it inappropriate for the web. Content experts want an easy way to migrate their existing PowerPoint slides into an eLearning course. Our tool provides a copy-paste mechanism to transfer titles and bullets from PowerPoint into a ReadyGo course. Course developers told us that they wanted to expand on PowerPoint to include features like FAQ, Glossary, Help, and Indexes. We provide straightforward templates to create these services and incorporate these functions. Additionally the ReadyGo Web Course Builder provides an easy way to rearrange chapters and pages within a course.
- The WCB current release includes copy-paste functions between courses; by course, chapter, page, sub-page, FAQ, help page, or Glossary. This means content experts can create reusable course modules and several developers can concurrently work on a single course. For example, it is possible to create standard glossaries or chapters and then share them between content experts in multiple courses.

- Another new feature is the ability to create a printable text version of an entire course, a chapter, FAQs, Glossary, etc. The main uses of this are for course handouts and editorial copies of the content.

The ReadyGo Web Course Builder is a tool focused on the content expert, enabling them to create web-ready tutorials and full eLearning courses. Because of the architectural decisions incorporated in the tool, most content experts are able to produce multi-chapter courses in less than one hour from installation of the product.

ReadyGo Web Course Builder Features

- ☐ Standard bullet pages with graphics
- ☐ Article pages for in-depth explanations
- ☐ Interactive exercises to learn by doing
- ☐ Quizzes to reinforce learning
- ☐ Tests to evaluate knowledge retention
- ☐ Glossary pages to define terminology
- ☐ FAQs to address common issues
- ☐ Links to other resources
- ☐ Structured navigation to eliminate broken links



Fill in dialog box
to create a course



Case Tool #2: CourseBuilder for Dreamweaver (Source: Macromedia)

The free Macromedia CourseBuilder Extension for Dreamweaver and UltraDev enable eLearning content developers to create interactive web pages with engaging learning content and deliver them across multiple platforms and browsers. Macromedia CourseBuilder Interactions let you define a complete web-based learning interaction. Tabbed wizard pages step you through creating and editing basic interactions. The wizard creates editable HTML, DHTML, and JavaScript based on the information that you enter. CourseBuilder extends the Macromedia Dreamweaver HTML editing functions by generating logic-based objects that interact with users, as well as external computer-managed instruction (CMI) applications that track and score user input.

Easily extend built-in functionality by creating your own Macromedia CourseBuilder templates. Modify existing templates using your own fonts and imagery. Use the new Save to Gallery feature to add customized interactions to the gallery, and even create new categories of templates.

Multiple Choice and True/False Questions

Use multiple choice interactions for surveys, drill and practice, and tests and assessments. You can track quizzes to determine if further instruction might be necessary and collate survey results.

Exploratory Functions

Use the explore interaction to place hot areas on the screen for users to explore specific parts of an object or concept.

Text Entry Items

Have users show mastery of subject matter using text entries for simple word recall entries or longer answer responses, or gather user information such as passwords.

Drag-and-Drop Exercises

Offer users hands-on learning in which they interact directly with a lesson by manipulating objects on-screen. For example, have users assemble a piece of machinery from its parts or relate concepts spatially.

Button Functions

Simulate physical controls such as web page navigation controls, toggle switches in an airplane cockpit, or machinery controls using extensible sib-state buttons.

Timers

Indicate passing time to users as they complete a question or scenario. You can time a single interaction or coordinate several timed responses or actions from an interaction on a page.

Sliders

Use slider interactions to allow users to select a choice or range of choices on a linear scale of values. For example, simulate a light dimmer switch in a home, or an airplane's flap lever control, or even a heater control on a car's dashboard.

Action Manager

Use an Action Manager Object to collect results from a set of multiple choice questions, summarize these results, and send a score back to a tracking system. You can use Action Manager to take advantage of existing interactions on a page while creating a wide variety of system actions.

Track student progress and scores directly to Lotus Pathware learning management system, or save the information in a database, such as Microsoft Access, SQL Server, or Oracle.

Title	Status	Score	Max. Score	Accesses	Time In	Last Access Date	Last Acc. Time
Training for Sales and Marketing Professionals	<input checked="" type="checkbox"/>	80	100	1	0:00:00	5/1/99	3:04
Home	<input type="checkbox"/>	0	0	1	0:00:00	5/1/99	2:58
Overview	<input checked="" type="checkbox"/>						
Overview	<input checked="" type="checkbox"/>						
Features & Benefits	<input checked="" type="checkbox"/>						
Optional Features	<input checked="" type="checkbox"/>	0	0	1	0:00:00	5/1/99	2:58
Overview Quiz	<input checked="" type="checkbox"/>	80	100	1	0:00:00	5/1/99	3:00
Understand the Need	<input checked="" type="checkbox"/>	0	0	0	0:00:00	5/1/99	2:58

Correct When: Any Correct and None Incorrect
 Knowledge Track: Send results to a management system if present
 Tries Allowed: Unlimited

Use Knowledge Track to Track:

- The number of right and wrong target responses a user has made.
- The number of tries the user took to get the right answer.
- The amount of time it took the user to respond to an interaction.
- The amount of time the user spent in an interaction.
- The amount of time remaining if there was a time limit on an interaction.
- The score for an interaction.

Complex interactions created in Macromedia CourseBuilder for Dreamweaver do not require any plug-in or applet downloads. The content is web-native (HTML, DHTML, and JavaScript) and compatible with Netscape and Microsoft web browsers.

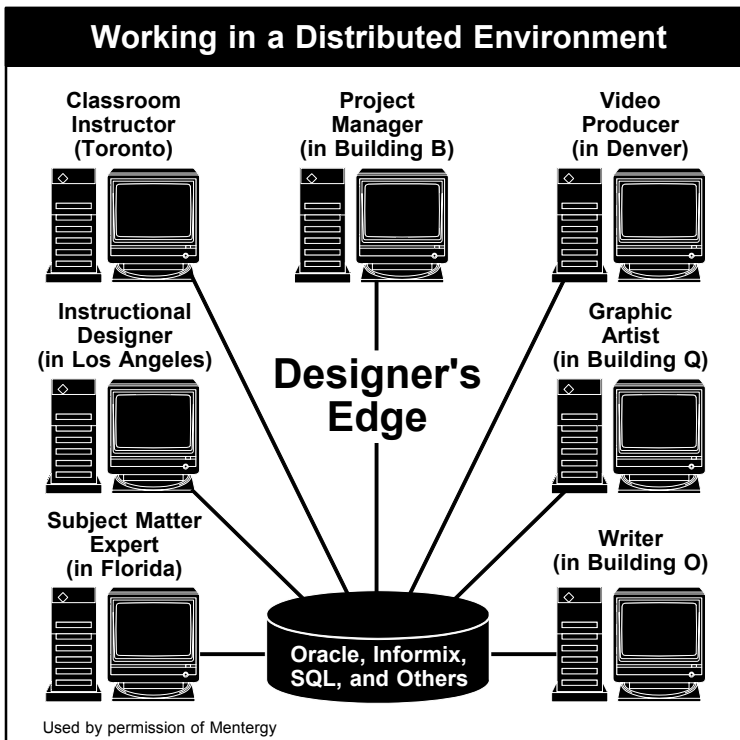
The Action Manager is a visual interface for creating engaging interactivity and sophisticated logic for web applications.

Create interactions that judge user responses, track a user's movements on the screen, time out a question, or respond to an interaction with any number of multimedia or logic-based responses. The Action Manager allows you to build complex logic to create scenarios that engage users with a high level of interactivity.

Quickly and easily add content elements such as Macromedia Director, Authorware, and Flash in one easy step for access to unlimited amounts of rich-media content.

Case Tool #3: Designer's Edge (Source: Mentergy)

Designer's Edge® is a training design and planning tool that incorporates several enhancements for developers of training applications, which include the ability to do task analysis and report customization, as well as combined interfaces throughout the tool to increase user productivity and encourage the creation of reusable elements. The tool's Enterprise version includes the desktop capabilities as well as enterprise database support through ODBC connectivity, security features, and the functionality for exporting training titles directly to HTML and Java. As shown in the graphic below, Designer's Edge is a middleware platform that brings together a number of courseware development professionals in order to accelerate the ISD process.



Designer's Edge key benefits include the following:

- Increases trainers' productivity by an average of 36 percent (Source: Kagel Associates)
- Provides a starting point and step-by-step guidance through critical decision-making stages and design processes
- Standardizes the design process for the entire development team
- Integrates data and displays it in a visual course map for easy access
- Provides a fully integrated script-storyboard with visual screen layout capabilities, showing thumbnails of graphics used
- Powerful online help puts a virtual encyclopedia of learning strategies and instructional design expertise at your fingertips

Other key features include the following:

- Direct output to HTML and Java to get quality cross-platform training online quickly
- Links directly to popular authoring systems such as Quest[®], Authorware[®], and Toolbook[®] II for final development
- Trainers can customize the interface and wizards to support their own design methodology
- Creates a central media log of video, graphics, audio, etc.
- Provides flexibility to execute functions (such as reports and synergy outputs) for individual modules from the course map

With these features, Designer's Edge forms a set of integrated pre-authoring tools and wizards, built by instructional design experts, to walk trainers through the entire instructional design process, from analysis to evaluation. The tool includes an effective process to create storyboards for CBT, online training for virtual classrooms, or lesson plans for classroom-based training.

Enhanced instruction for a blended training environment is accomplished with Designer's Edge Enterprise, whereby large organizations can benefit from centralized application installation, a quicker implementation, and lower costs for large-scale content deployment. Designer's Edge also assists instructional designers in all phases of the training development cycle, from analysis to evaluation, and provides all of the tools, examples, advice, and templates needed to develop a powerful design for a technology-based as well as instructor-based training course. In this sense, it offers many benefits to the ISD professionals, including process acceleration, data organization capabilities, online instructional expertise, and extensibility.

This page intentionally left blank

Chapter 6

Case Studies and Best Practices

The following case studies demonstrate various models and approaches for blended eLearning solutions within several different industries. Though these cases have been described and discussed in greater detail in other publications and on the conference circuit, we have included them here to illustrate various approaches to creating blended eLearning solutions and to demonstrate that there is no single way or means for implementing such systems. We therefore encourage our readers to research these projects more fully on their own and, where appropriate, to seek additional information and guidance from the principals involved using links on the book's companion website (www.blended-elearning.com).

Honeywell

Honeywell was an early pioneer in the delivery of blended eLearning solutions at their Automation College in Phoenix, Arizona. The Automation College was responsible for training client engineers, technicians, and system operators in the proper use of automation and control systems. Because of the complexity of the systems and the need to make sure the learners really knew the information being taught, the variable lengths of training classes steadily grew, and some of them totaled eight days. Consequently, at the advent of web-based training, Honeywell began a detailed analysis process for defining their eLearning strategy, and it was immediately obvious to them that they would not be able to completely do away with the live instruction entirely. Consequently, much of the time spent in class was actually in a hands-on laboratory with simulators that could mimic real plant operations. Here instructors did note that the first few days were usually spent in knowledge transfer, which followed a more traditional lecture format. So it was

Honeywell INDUSTRIAL AUTOMATION & CONTROL

About Products & Services Industries Served Investor Relations Media Kit Careers

Home 1.800.852.3211 or 602.313.5669 e-mail: automation-college@honeywell.com

- GETTING STARTED
- TRAINING SOLUTIONS
- COURSES
- SCHEDULE
- DISTANCE LEARNING
- TRAVEL & LODGING
- POLICIES
- SUBSCRIBE NOW
- ABOUT US
- CONTACT ME
- REQUEST TRAINING CENTER ENROLLMENT!
- REQUEST WEB BASED ENROLLMENT!
- CONTINUOUS WEB SOLUTIONS - CINCINNATI
- CROSS DIRECTIONAL CONTROLS - DEVON
- DA VINCI QUALITY CONTROL - WATERFORD
- WORLDWIDE TRAINING
 - ALCONT PRINTA FINLAND
 - FSC SYSTEMS NETHERLANDS

Automation College

here

TPS Builder R1s 130
Web Based Training
Click here

Special News

- Houston Schedule
- Training Planner
- Duluth Map
- Phoenix Map
- Toronto Map
- Registration Information
- SESP Training Match
- Take Web Based Course

Automation College
Providing Comprehensive Training for IAC Customers in North America

New TPS Maintenance Training Program! [Click and go to...](#)

FEEDBACK QUESTIONS

Used by permission, Honeywell

finally decided that if they could reduce the time in Phoenix to five days and provide the other three days as asynchronous classroom training, they would have the best of both worlds. The ROI model for this training program and the cost savings in travel for the customers were significant. Three days back on the job and no travel costs over a weekend were typical savings, and a better resource scheduling of labs and classrooms also improved based on increased efficiency.

Because of Honeywell's heavy dependence on Notes, Lotus' LearningSpace (now IBM Mindspan) was chosen to implement the online curriculum component and to better manage students. Another key feature of LearningSpace was its facilitated classroom model. Rather than leaving people to self-study on their own, learner community e-mails and discussion boards provided a feedback mechanism that kept learners on-task. This communities of practice (COP) approach also produced better completion rates and ensured that the learner was ready to come into the lab to practice what they had been studying. There was also less rush to cram information into students' heads, though it was possible over a three-week period to get through three days worth of content at one's own pace. With a short review period, students could then be ready to dive right into the simulations and practice. However, other student needs surfaced during the process. Based on the shorter development cycles that the Honeywell products were undergoing in order to remain competitive, training was also needed more frequently. So a strategy involving synchronous update sessions for dynamic content produced significant questions and instant feedback loops that complemented the asynchronous web-based training that was being implemented.

Two other strategies that rounded out Honeywell's blended eLearning solution were also employed. For stable content with different audience characteristics, a combined Web/CBT strategy was pursued. CD-ROMs were built in Authorware and deployed primarily on stand-alone workstations. Additionally,

for common topics—like FieldBus, with its ill-structured domains and industry-standard information—an Electronic Performance Support System and Knowledge Management repository were created. This allowed interested parties to access the up-to-date information through links to the latest resources and document repositories on the web. All of these strategies and systems worked together to provide a richer learning experience, with a better ROI than any one solution by itself could achieve. In short, Honeywell had created an effective blended eLearning solution that built upon online learning, EPSS, and KM through its communities of practice.

3Com[®] University[™]

The blended eLearning solution contained within 3Com University provides an excellent example of various approaches to managing all of 3Com's online courses as well as the credentialing of its various training and learning programs worldwide. Based on the Saba Learning Management System with an outsourcing of online registration, e-commerce, synchronous learning, content development, and testing to an eLearning ASP (RWD Technologies[®]), 3Com University offers a unique insight into how a complex online training and certification platform can be created with multiple blended eLearning technology partners. Its home screen below reflects some of this multi-purposing.

The screenshot shows the 3Com University website. At the top, there is a search bar and navigation links for '3COM UNIVERSITY' and 'ENTIRE SITE'. Below this is a secondary navigation bar with links for 'LOGIN', 'DOWNLOADS', 'PARTNER & RESSELLER SITE', 'MY ACCOUNT', and 'ORDER STATUS'. A 'REVIEW CART OR CHECKOUT' button is also visible. The main header features the 3Com logo and a navigation menu with links for '3Com University', 'Courses', 'Certification', 'Events', 'Learning Support', and 'Contact 3Com University'. The main content area is titled '3Com University' and includes a brief description of the university's mission. It also features sections for 'Courses' and 'Certification', and a 'HIGHLIGHTS' section with links to 'What's New', 'Partner Training Web Site', and 'Award Winning Training'.

Used by permission, 3Com

At first glance, 3Com's blended eLearning model looks like a combination of instructor-led training classes, live conference events, synchronous online events, self-paced WBT courses, training manuals, and a certification process, but there is more to it than that. All of these components are important, but opportunities to blend eLearning with other systems like an Enterprise LDAP directory service from getAccess, 3Knowledge—3Com's online knowledge base—and performance-oriented solutions like Palm-based learning assistant modules present a blended approach to testing and competency assessment. Let's examine these areas further.

First, 3Com has used limited synchronous sessions to train their global staff and partners with less need for travel and time-off task. These sessions are typically performance oriented, for smaller groups, and delivered to a worldwide audience in the Americas, EMEA (Europe, Middle East, and Africa), and APR (Asia, Pacific-Rim).



Used by permission, 3Com

A more substantial and widely used approach for training is self-paced WBT modules. 3Com's Saba-based learning catalog lists instructor-led courses, downloadable web modules, online courses, and training manuals. The WBT modules were produced by a variety of internal as well as vendor company resources. This multi-vendor solution has helped to produce many courses in a short amount of time and ensure that multiple options exist for development of course modules.



Used by permission, 3Com

Online WBT courses must be managed and delivered in an easy, yet systematic way. Some courses require payment as well. In order to meet this need, 3Com implemented Saba to keep track of these courses and to provide access to them. Even if the courses are hosted elsewhere, Saba can still provide a link to the course material.

Another important aspect of 3Com's performance-oriented learning model is testing, assessment, and certification. Since individuals might learn the required skills to attain competency in a variety of ways (ILT, WBT, practical experience, mentoring, training manuals, etc.), having a common performance metric is imperative. 3Com's online testing programs provide a secure method of assessing performance for low-stakes knowledge and performance assessment, and set the stage for rich performance-

oriented mastery practicum tests. For example, once an individual has taken five Master of Network Sciences online exams, they are qualified to take in person the lab practicum final test. This blended approach to testing is yet another best practice and innovation that provides additional security and a lower price point than other approaches to assessing performance and competency and credentialing those efforts. These results are passed from the hosted Certification.Net service to the Saba LMS system that maintains transcripts and learner records.

The screenshot displays the 3Com University Certification page. At the top left is the 3COM logo. A navigation bar includes 'Buy Direct', 'Products', 'Service & Support', 'Contact Us', 'Site Map', and 'Countries'. A search bar and 'Review Cart' link are also present. A sidebar on the left contains links for '3Com University Home', 'Courses', 'Certification', and 'Learning Support'. The main content area is titled '3Com University Certification' and features a 'New Users' section with a 'Create New User Account' button. Below this is a 'Returning Users' section with fields for 'Internet Email' and 'Password', and a 'Continue' button. A 'Forgot your password?' section includes an 'Internet Email' field and an 'Email Password' button. The footer contains links for 'Login', 'Solutions & Technologies', 'Training', 'Corporate Information', and 'Legal'.

Used by permission, 3Com

Finally, 3Com has been exploring innovative approaches to getting needed information to internal and external field audiences who need to know about 3Com products to perform their jobs. (See 3Com Mobile eLearning case study in Chapter 13.)

IBM *Basic Blue for Managers*

In 2001, 6,318 new IBM managers—from every geography—have attended ***Basic Blue for Managers***, IBM’s first blended eLearning program. Combining four different “tiers” of training—three technology-delivered and a one-week classroom Learning Lab—over a 52-week period, ***Basic Blue*** constitutes IBM’s “e-business” approach to leadership development. ***Basic Blue for Managers*** equips all new IBM managers with the fundamental knowledge and skills they need as leaders and people managers. Aligned with IBM’s strategic focus on e-business, the program combines the power of eLearning with in-class activities.

Basic Blue’s founding principle is that learning is an extended **process**, *not* a one-time event. It immerses managers in a collaborative Lotus Notes LearningSpace with online self-study, online simulators, individual competencies assessments, an online tutor, second-line management coaching, and classroom experiences. The 12-month process focuses on developing skilled managers/leaders with the competencies required to lead high-performance teams in the new millennium.

Honored with three awards for “Excellence in Practice” by the American Society for Training & Development (February 2001) and cited among the 10 best world-class implementations of corporate learning by “E-Learning Across the Enterprise: The Benchmarking Study of Best Practices” (Brandon Hall, September 2000), ***Basic Blue for Managers’*** eLearning model and templates are now being adopted by other parts of the company (including Sales & Distribution, Global Services Institute, MindSpan) and being sold externally by IBM Learning Services.

Highlights of ***Basic Blue for Managers’*** results:

- 5 times as much content delivered as previous new-manager offering

- Cost of student day reduced to one-third of prior day rate (\$400 vs. \$135)
- Based on 5,000 new managers per year, cost avoidance is \$24.4 million (includes all program costs, travel, living expenses, and manager time)
- 75 percent of program is delivered through distance learning and 25 percent via classroom
- Allows managers to access materials at their own convenience—anywhere in the world
- Reuse of templates by other IBM organizations has saved IBM \$850,000 to date
- Learning evaluation measures show significant increases in leadership knowledge, skills transfer to the job, and business results improvement
- Alumni reports of first-year business enhancements due to leadership skill improvements average \$450,000 each
- Based on \$8,708 cost per student, return on investment (ROI) is 57 to 1
- Year-to-date intranet page requests total **7,678,944**, representing a **300 percent** increase from 1999

Breakthrough Solutions Transforming the IBM Culture: Company Adopts IBM MD's Blended e-Learning Model

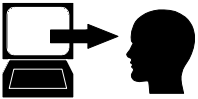
From its inception, IBM Management Development (MD) has taught leadership and management in nearly every business and economic cycle. Its knowledge base derives from the greatest experts in business, and from its own experience in managing one of the most dynamic companies in the world. Its programs are designed and taught by successful managers with firsthand, first-rate knowledge of their field, and an ability to impart their insights in meaningful and compelling ways.

To promote effective training and development, IBM Management Development uses designs that link active learning with the business environment. One such design, which

became fully developed and deployed throughout 2000, is its industry-acclaimed blended eLearning model. In 2000, IBM Management Development took the lead within IBM to develop a model of leadership development that incorporates four distinct instructional approaches (tiers) to provide an array of technology-enhanced learning to support the standard classroom intervention. IBM managers now use this four-tier *e-business* learning approach to master skills and behaviors that grow them as outstanding managers and leaders.

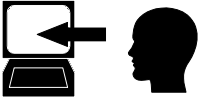
In 2000, **IBM Learning Services** adopted the IBM MD model, and other company divisions (e.g., S&D and IGSI) followed, such that enterprise learning initiatives now build core competencies via the IBM MD design: a web-based learning infrastructure, virtual collaborative tools, and interactive online simulators to augment face-to-face classroom instruction.

IBM MD's blended four-tier leadership-development approach provides IBM managers worldwide an integrated process available 24/7, directly from their desktops or ThinkPads.



TIER 1. Information and just-in-time online performance support. These online resources

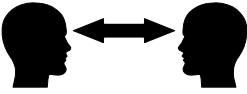
primarily address an ongoing, immediate management concern. The manager with an existing problem accesses the relevant topic either via an index or the keyword search engine, and brings the material directly to desktop for online reading, printing to hard copy, or mailing to an e-mail account. Best thinking on over 50 leadership and people-management topics of concern to our managers are available, including ManageMentor provided by Harvard Business School Publishing. Tools—printable worksheets and checklists—are also available for specific action issues. Links to important external web-sites are also highlighted. Because we team globally, managers need to have access to policies and practices in different countries. Tier 1 offerings allow managers quick and easy access to all global HR material.



TIER 2. Interactive online learning. Managers further enhance their knowledge and personal development beyond the awareness level by engaging in immersive simulations of the issues presented in Tier 1. The online Coaching Simulator alone comprises 8 different scenarios, with over 5,000 screens of actions, decisions points, and branching results. Twenty-six other simulations cover other Human Resources topics such as Business Conduct Guidelines, Multicultural Issues, Work-Life Issues, Retention, and Personal Business Commitments. *Going Global*, IBM MD's award-winning web-site on multicultural business, features over 300 interactive Culture Clashes. **A generic version of MD's "4 Tier e-Learning Model" is currently under patent and trademark nomination for IBM.**



TIER 3. Online collaboration. Brings eLearners together through technology. Through IBM products such as TeamRoom, CustomerRoom, and Lotus LearningSpace, managers team with other managers in virtual groupware spaces. Here they learn collaboration skills, and create and build real-life learning networks to enhance our company's own intellectual capital. Collaborative spaces using same-place, different-time communication enable a truly global learning environment, eliminating the problems of time zones and travel. This part of the learning process introduces the give and take of human dynamics—and uses the benefits of technology to transcend time and space. Management Development supports virtual teams with materials and consulting to maximize business results and learning at the same time.



TIER 4. Classroom “Learning Labs.” For developing people skills, face-to-face human interaction is arguably the most powerful of

learning interventions. Classroom activities provide immediate responses, are flexible to human needs, and can adapt as needed to different learners’ styles. For leadership development, nothing quite duplicates face-to-face learning. In addition, a classroom of peer learners can provide added motivation, inspiration, and a community environment further stimulating interest and involvement. Management Development continues to offer interactive classroom experiences. The in-class experiences require the learner to master the material contained in Tiers 1, 2, and 3 so that the precious time spent in classroom Learning Labs can target deeper and richer skills development.

Harvard Business School’s IBM Manager Learning-Preference Study: “*Basic Blue for Managers*”

Harvard Business School Professor Youngme Moon assessed IBM managers’ preferences for different learning modalities throughout the new *Basic Blue* online (Tiers 1–3) and classroom (Tier 4) experiences (November 1, 1999). Dr. Moon reported that respondents (N = 62), after experiencing *Basic Blue*, universally extolled *both* learning modalities—classroom and online—without on and with equal enthusiasm. All respondents reported in interviews that they preferred learning the informational material (Phase I: Cognitive-based development) online from their own home or office, *rather than* in a classroom setting. Representative comments from interviewees:

“Because the information was the type of stuff I could learn on my own, there was really no reason for it to be communicated in a classroom. I think I would have been resentful if it had been dumped on me in a classroom. We’re no dummies. . . we can learn this kind of stuff on our own.”

“. . . it’s too much information to be taught in a classroom format. You need to be able to sift through this stuff from the comfort of your own home, at your own pace.”

“There’s no question that the ability to work at home or in my office made some material easier. This was a huge advantage.”

With respect to the behavioral skills to be learned (Phase II), managers uniformly agreed that they preferred learning this material in a *classroom* environment, rather than in an online setting.

“Just as the Phase I [informational] material would not have worked in the classroom, the Phase II [skills] stuff would not have worked in an online setting, or any other setting. It was absolutely essential that we all sit in a classroom together for Phase II.”

“Phase II built on Phase I. In Phase I, we were all just absorbing standard material and really learning a new ‘vocabulary’ for being a manager. This laid the groundwork for the stuff we accomplished in Phase II, which involved taking the groundwork, building on it.”

Additionally, participants recognized that when implemented appropriately, learning modalities can be synergistic rather than competing.

“The key thing was the ‘hybrid’ model. Rather than adopting a totally online training program or a totally in-classroom training program, they decided to take a ‘best of both worlds’ approach, and it really worked.”

“Neither phase could have worked without the other. Phase I set up Phase II really nicely, and Phase II would have been impossible to pull off if we hadn’t done the prep work in Phase I.”

“Because of the Phase I background learning, we were able to take things to a really high level in Phase II.”

Northrop Grumman

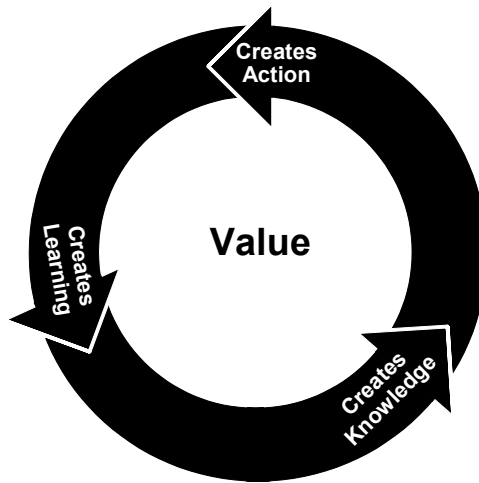
We explored examples of Northrop Grumman's effective KM practices earlier and would like to follow up on this by presenting additional information on how KM and eLearning are being linked within this organization. At the core of Northrop Grumman's blended approach is a set of core values listed as follows:*

- Learning creates value by building capability both for the organization and the individual
- Knowledge and learning are complementary and convergent toward building strategic capability
- eLearning must engage both tacit and explicit knowledge
- eLearning is most effectively built on an enterprise-wide basis
- eLearning contributes to organizational transformation
- Invest in learning, not in training

The following diagram provides an example of the value creation process. The continuum of creating knowledge, actions, and learning is at the core of the integration of knowledge management and eLearning. The integration process is further mapped out in a time-based process.

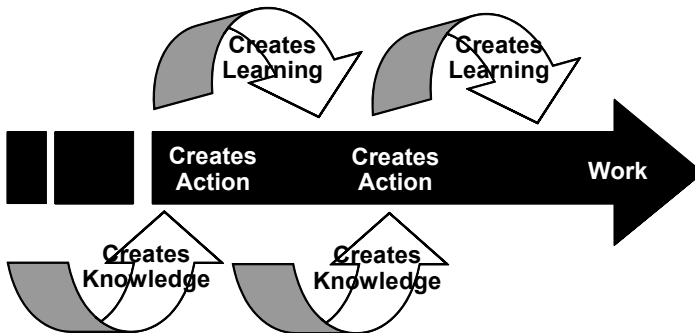
*Based on the work of Hubert St. Onge, Clarica

Integration



Used by permission of Northrop Grumman

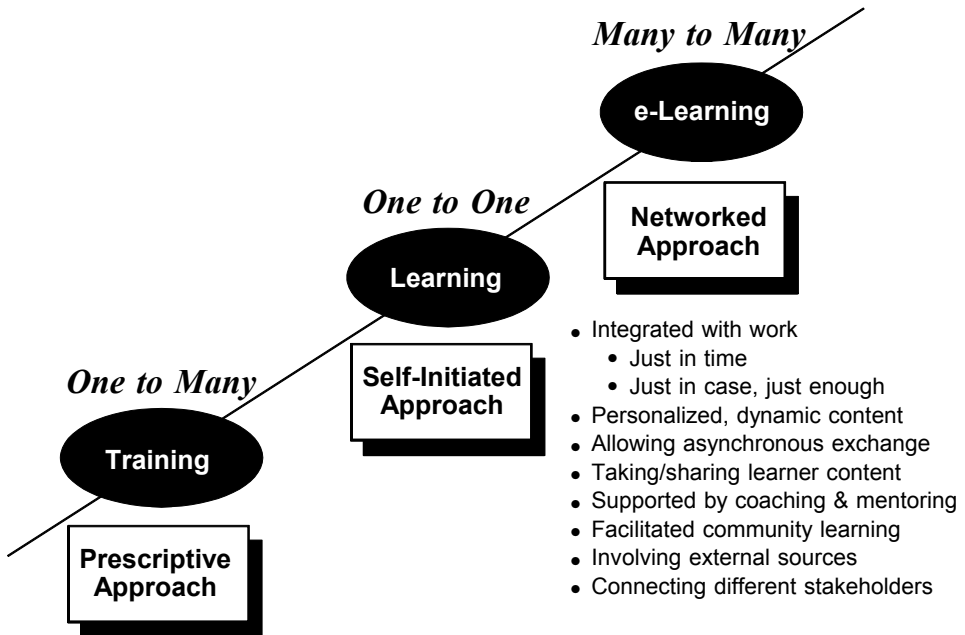
Integration



Used by permission of Northrop Grumman

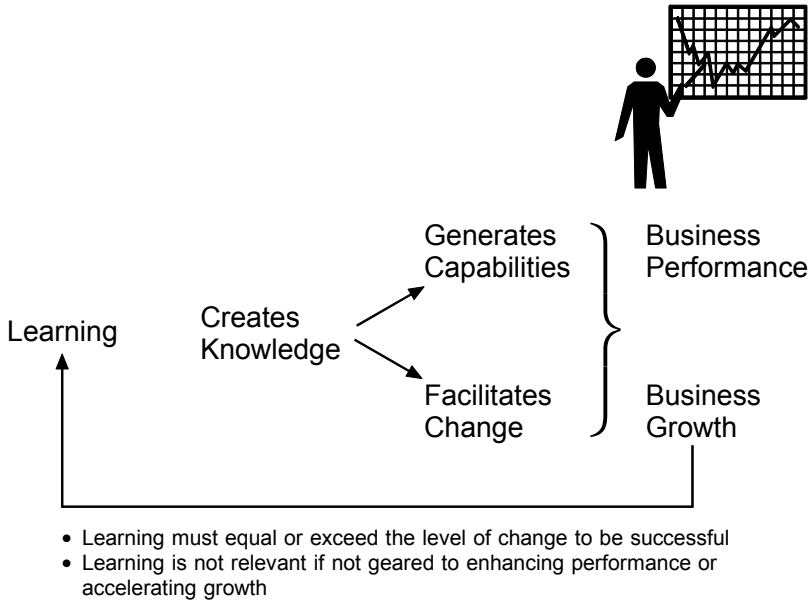
The evolution from training to learning and finally eLearning shows some of the functional changes in the way people learn in an organization committed to blended eLearning. Moving from training, where one individual provides information to many in a classroom-style setting, to self-directed learning and internally initiated efforts to find information that is

useful to a person's work is an important transition. As a next step though, eLearning promotes collaboration and a performance orientation based on just-in-time need. It is integrated with work and spans throughout the organization as a facilitated, networked approach to knowledge sharing and learning.



Used by permission of Northrop Grumman
Adapted from St. Onge, Clarica

These conceptual approaches and values have led to a number of tactics, projects, and initiatives that have helped eLearning, performance, and knowledge management proliferate throughout the organization. Within the areas of people, process, and technology, a wide variety of initiatives has made them a reality. Examples include video knowledge capture, talent management practices, communities of practice, document management solutions, knowledge portals, and expert locator services.



Used by permission of Northrop Grumman

Each of these systems is united in a common purpose of expanding the return on knowledge within the organization and improving individual and organizational performance. This is particularly important with an aging, expert work force and a labor pool that will need to be replaced over the next few years as normal attrition occurs. Northrop Grumman has provided a clear picture of the business value proposition and expected results of a blended eLearning solution that combines online learning, knowledge management, and electronic performance support.

BAE Systems

BAE Systems is one of the world's largest aerospace companies with approximately 100,000 employees worldwide. The logistics of global delivery to a diverse audience have led to a blended eLearning strategy that incorporates many of the structures associated with having a comprehensive corporate university.

BAE's Virtual University Strategy starts with the mission of "Competitiveness Through Learning." In order to achieve this, several enabling objectives have been set. First, there must be alignment and integration of learning and knowledge throughout the organization. Also, sharing and embedding best practice have become standard operations throughout the organization. Over time, this operation leads to a culture of life-long learning that maximizes organizational performance.

Defining the Environment

A variety of learning environments has been employed to meet the learning needs of a large, diverse work force. This includes the use of desktop computers as well as needed learning resource centers for sessions that require physical presence, collaboration, or focused time and attention. Additionally, the company would like to make home use an option for self-motivated employees. This requires a significant commitment to support functions like MIS, administration, and technical support. Additionally, online tools will make it possible to improve performance throughout the organization, but e-Enablement will also require a renewed commitment to learning. Life-long learning is becoming the new approach rather than just minimum compliance. To track and manage this, a more sophisticated learning management system will be required to track performance.

Choosing the Right Sources of Learning

A practical approach to media and delivery selection for the right blend of eLearning begins with analysis. Several examples are as follows: Should online courses be comprehensive training or quick fixes (short modules that provide just-in-time information)? How can on-the-job learning be maximized in a blended environment? What is the optimum mix of access to data/information and access to people with the requisite knowledge and skills to perform a particular function or teach it? How will

knowledge management be capitalized on to impact business performance?

Hardware Infrastructure

In addition to the learning delivery, the following technical issues must be examined:

- Will the online learning be delivered over the intranet or the Internet, or both?
- Is the appropriate security and bandwidth available to deliver information online?
- Will the IT infrastructure be able to sustain global connectivity and consistency with the increased demands of eLearning?
- With a desktop IT lockdown culture, does online delivery still make sense as a viable alternative?
- Is the system future proof (relatively)?

Integrating Online and Traditional Methods

Core premises about the way blending should occur at BAE include the use of online learning as a prerequisite to a traditional training class. This way everyone can come into the class with a minimum baseline of information, allowing instruction to proceed at a faster pace with less review required. This can also lead to a reduction in off-site and residential training. Saving thousands of pounds (or dollars) per person per training event is a worthy goal for showing immediate bottom-line benefits. Another important, but often overlooked aspect is the importance of accreditation. Degrees, certifications, and other matriculated activities provide another level of integrity to the process as well as the evaluated experience and performance of the learner.

The Importance of Culture

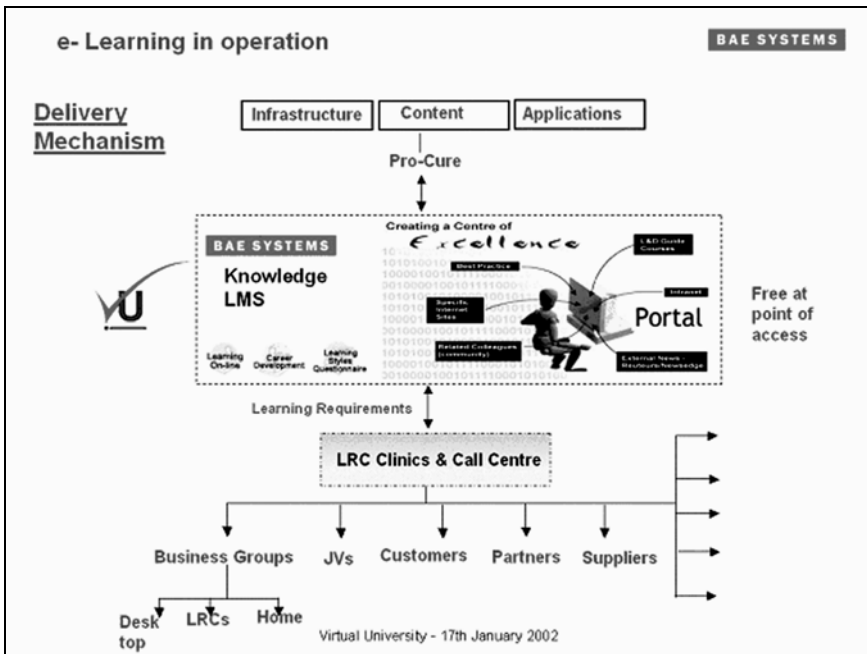
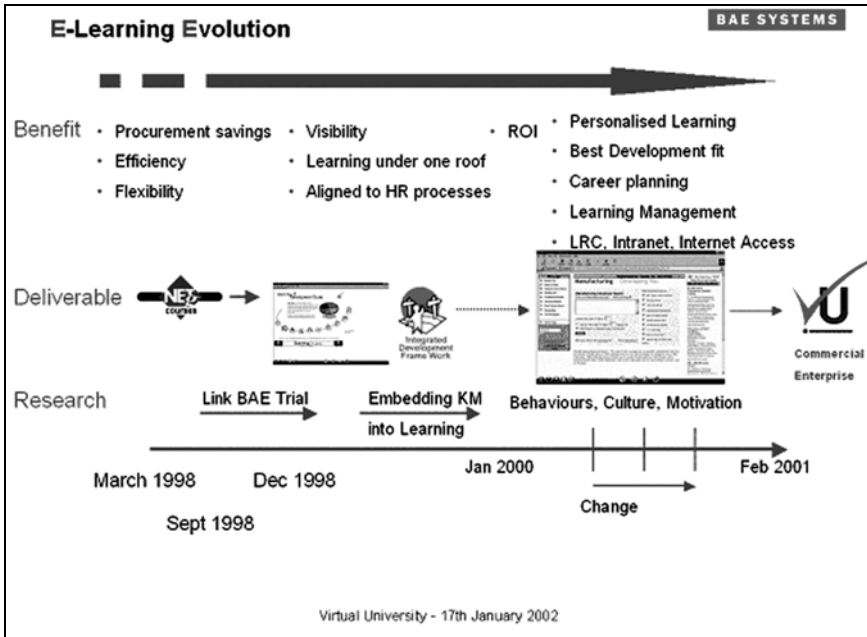
Several cultural aspects make the blending of online and traditional learning possible. First, supportive management is critical to the required change management and sponsorship required to kick off a substantial corporate initiative. Another cultural issue that will affect the outcome of whatever is rolled out is the concept of open or controlled access to materials. This can sometimes come down to the fundamental question: Do we trust our employees? Another significant driver can be links to company processes (e.g., performance management, pay, etc.). Specific consideration for a global company is the issue of national culture and its impact on learning. Examples include the U.K. versus U.S. cultural differences in the way employees approach learning and the way that corporate management uses it for the performance improvement of the organization.

Feedback Is More Important

To make continuous improvements, it is necessary to gather feedback and appropriate measurements. For example, is this course the best development fit? What is the ratio of learners using the whole course versus bite-sized chunks of just-in-time learning modules. Additionally, return on investment is another key indicator of the effectiveness of the blended eLearning solution related to bottom-line cost savings.

In short, you will still have to actively search for development (courses, placements, etc.) and examine how a blended solution aligns to organization and individual needs and leads to improved performance.

The following chart shows the evolution of the KM and eLearning components of the growth of BAE's extra Virtual Corporate University offering. Notice the heavy emphasis on sensible approaches that lead to improved individual and business performance as objectives.



Used by permission of BAE Systems

This figure shows the approach for a virtual university delivery system to affect the performance of the entire value chain of a business (internal, joint ventures, customers, partners, suppliers). The integration of knowledge management, collaboration, self-service HR and training, and online learning forms a powerful systems approach to meeting the needs of a large-scale enterprise.

Conclusions

The following key points summarize key findings from BAE's rollout:

- Culture, environment, and support are key
- Don't stop at training courses
- Understand the limits of your hardware
- Don't plan in isolation of traditional methods
- Integrate provision with other HR systems and processes
- eLearning throughout the extended enterprise
- Customer focus is key

In conclusion, tying eLearning to the bottom line business benefit from the company Intranet is a major corporate advantage:

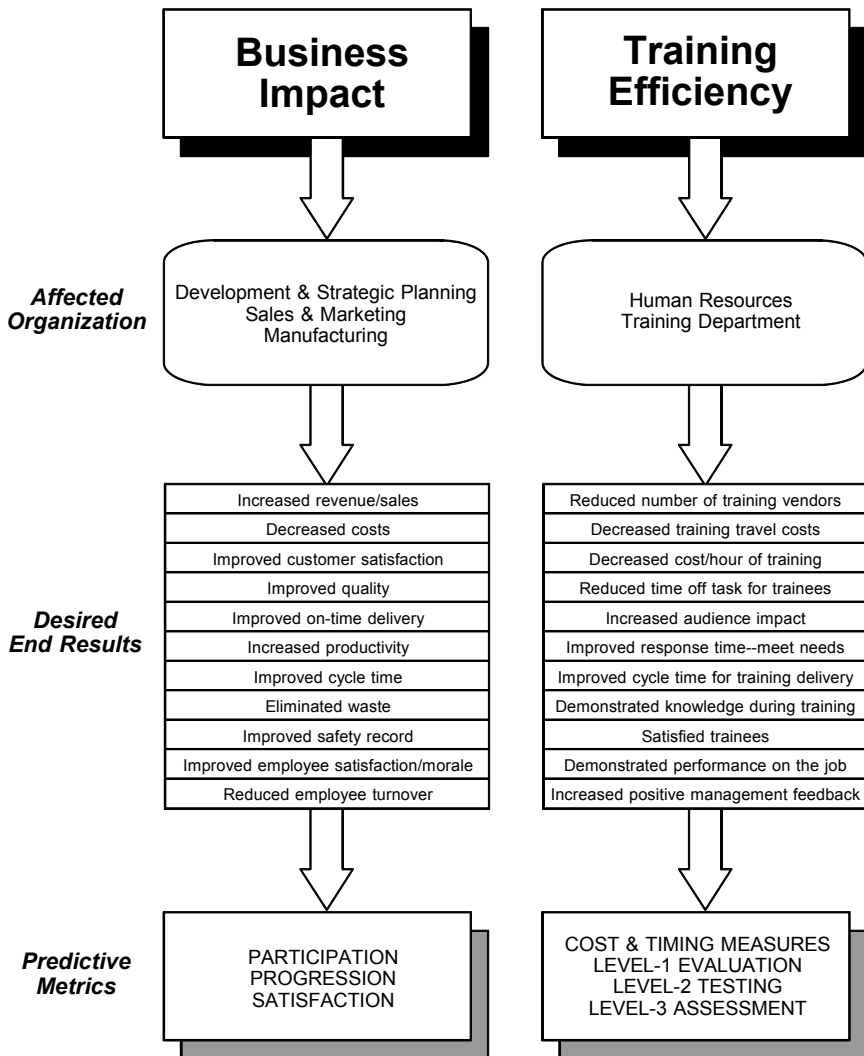
I am convinced that our Intranet can greatly assist us in our efforts to improve the overall performance of this company. The potential it has to help us share our best practices, deliver learning and provide real time measurement performance has been proved by very many companies worldwide.

– *John Weston, Chief Executive, BAE Systems*

The case studies presented here are just early examples of blended eLearning approaches that we will see in more detail and with greater frequency as time goes on. More examples of leading edge best practices in combining eLearning/online learning, KM, and performance support can be found at <http://www.blended-elearning.com>.

These two outcomes have very different areas of measurement when it comes to an organization or department impacted, the desired results that might be achieved, and the predictive metrics that are established. Below are two lists that define the critical success areas.

Examples of ROK and ROI Measurement Areas



As an organization moves forward with implementing a blended eLearning solution, the concepts and actions necessary to ensure the capture of the requisite data to measure the ROK and ROI must be embedded in all aspects of development and operations. The goal of obtaining this measurement information is to determine the effectiveness of learning on the knowledge of employees and how this impacts the bottom line. Furthermore, ensuring that both ROK and ROI data are captured and analyzed requires employing these concepts at the earliest stages of development. The metrics required to capture such data must be adjusted as required as various components of a blended eLearning solution are implemented. And finally, the collection of this data must be well defined, preferably made quantitative, and the collection activity ongoing.

Capturing ROK Metrics

In the context of the strategy previously described, ROK refers to that part of true business performance improvement that can be attributed to the blended eLearning intervention; (i.e., the business return from the investment in such a solution). There are two basic ways for a business to achieve return on investment: *increase revenue* or *decrease cost* (or preferably do both at the same time). Ideally, we would like to use metrics to isolate and directly capture such revenue and cost data. Unfortunately, it is rarely practical to directly obtain business unit or department ROI measurements attributed to pure learning. To overcome this obstacle, it is useful to think of metrics as falling into two major categories, *end-result metrics* and *predictive metrics*:

- **End-result metrics** reflect the true bottom-line value of the intervention, typically expressed in dollars. Such data, if obtainable, would support a precise calculation of the ROK to a business unit by showing the increased revenue and/or decreased costs attributed to the training intervention.

Example: *As a direct result of the \$500,000 sales force training investment, sales increased by 10 percent from \$10 million to \$11 million, while training costs decreased by 20 percent from \$500,000 to \$400,000.*

Unfortunately, such data cannot always be isolated for knowledge transfer or learning interventions alone, making end-result metrics sometimes impractical as a reporting tool.

- **Predictive metrics** provide quantitative data on factors that clearly contribute to the desired end-result metrics. Such metrics are more job/process oriented and reflect the “means to the end.”

Example: *The \$500,000 sales force training investment achieved an 80 percent increase in the number of sales personnel who demonstrated their ability to retain and apply the new product knowledge, and this critical new knowledge was delivered to the entire sales force three weeks faster than for the previous new product introduction.*

It is feasible to measure the (1) participation in the training event, (2) successful completion of knowledge transfer, and (3) speed of reaching the target population with valuable new knowledge. If confidence can be established that a sound training analysis and design approach took place properly connecting knowledge transfer content to true business needs, then it is fair to associate these predictive metrics with the ultimate desired business end-result metrics.

As a practical matter, the business impact metrics can be captured indirectly through a predictive metrics approach. Practical predictive metrics can be established that fall into three major categories:

1. **Participation:** Hard measure of the number and speed of people successfully completing the valued courses and knowledge transfer events for their organization, and the trending of this metric over time (see example shown in Figure 7-1).
2. **Progression:** Hard measure of the number and speed of people advancing to defined job/career progression levels for their organization (based on qualification, testing, or certification events), and the trending of this metric over time (see example shown in Figure 7-2).
3. **Satisfaction:** Subjective measure (translated into numeric values) of employee satisfaction with training and knowledge transfer events and the effectiveness of this to do their jobs (at the conclusion of training and 6 months later—see example shown in Figure 7-3).

For this approach to be effective, it is imperative that the training course analysis and design methodology include performance-based data collection steps that associate these types of predictive metrics with business driver end-result metrics. Such correlation will be essential to ensuring proper focus for the course content as well as to support estimates of ROK associated with the training interventions. The “progression” category will also require an effort to develop some basic job/career progression categories for each of the Corporate University customer organizations.

Figure 1. Example of a “Participation” Metric

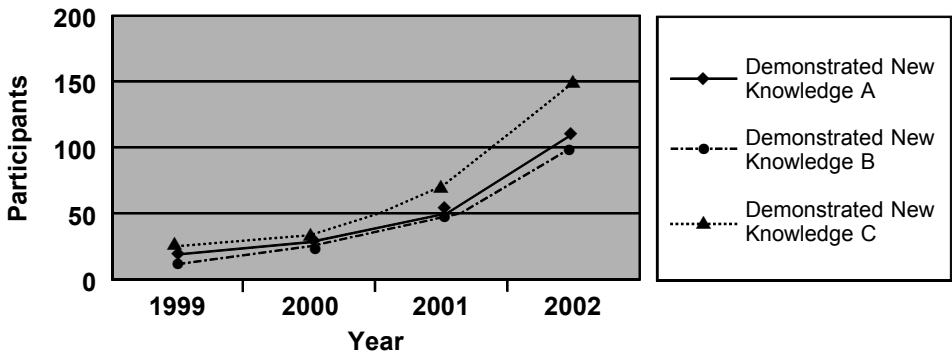


Figure 2. Example of a “Progression” Metric

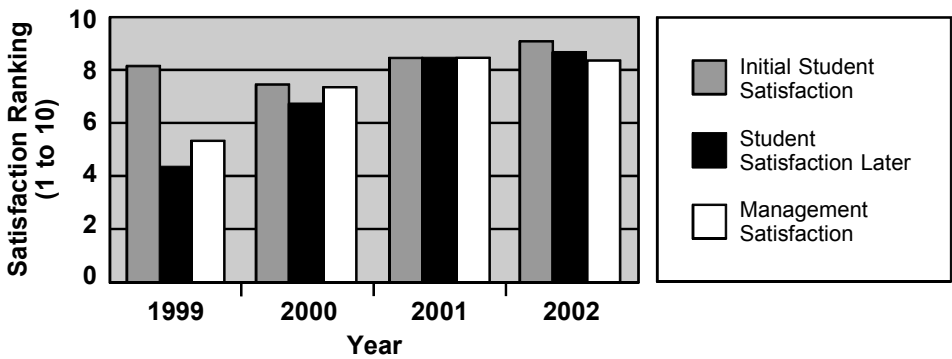
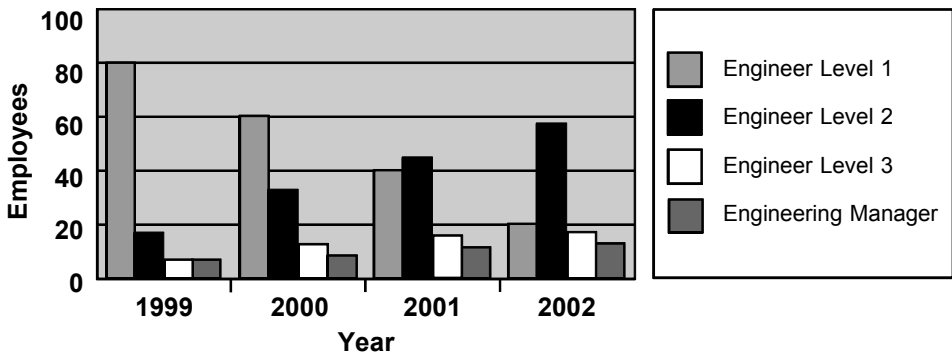


Figure 3. Example of a “Satisfaction” Metric



Capturing ROI Metrics

Many organizations already capture data relating to the level of acceptance of courseware (Level 1 evaluations). This should be extended to capture Level 2 and Level 3 evaluation data as well. And Level 4 data will be inferred from the metrics already described and will be realized in business outcomes. A more complete list of metrics that can be directly related to ROI for training efficiencies is summarized below:

- Employee opinion data (how people feel) via surveys coupled to training events
- Employee satisfaction survey results—trend of data associated with value of training
- Customer demand and attendance in the courses
- Increased pre- and post-course knowledge transfer
- Participation in refresher events
- Attendee satisfaction, immediate and post-event (Level 3 or Level 4 evaluations)
- Use of training reports to influence participation in courses
- Number of promotions tracked from within

Finally, the remaining training efficiency data listed should be collected using automatic measurement techniques to the maximum extent practical. These metrics include:

- Number of training vendors
- Training travel costs
- Cost/hour of training
- Time off task for trainees (course duration data)

- Responsiveness of training organization to identified customer organization needs (cycle time from identification of need to training delivery)

Developing and Using Stories Associated with ROI/ROK Gains

A final point worth making is the importance and value of capturing performance metrics “success stories” of the impact of a blended eLearning solution across the company. So-called “anecdotal” information can often include specific business improvement metrics and are generally believable because they come from the direct experiences of the affected business units. It is strongly recommended that these stories be captured in a consistent format that is visually appealing and regularly published through a shared story-telling culture.

Case Study: Learning Profiles, Career Planning, and Development within a Blended eLearning Solution (HRD Press)

In order to offer effective and efficient employee development and succession planning, more and more organizations today are turning to “profiling” as a critical path-planning and development tool, whereby web-based diagnostic instruments with detailed individual feedback reports can be used to help individuals move forward with their career plans. Profiles are now available in many professional and so-called “soft skills” areas, including leadership, diversity, change, teams, customer commitment, and many other topics. Below we offer a case study in profiling offered by our publisher, HRD Press, in conjunction with Training House.

How to USE PROFILES

Measuring the SITUATIONAL STYLE

Measuring the ORGANIZATION

Organizational SURVEYS

Measuring LEADERSHIP POTENTIAL

Measuring THE PERSON

profiles-r-us.com

1 INTRODUCTION

2 DATABASE REPORTAGE & ANALYSIS

3 DIAGNOSTIC INSTRUMENTS & PROFILES

4 ABOUT US / CONTACT

5 FREE PROFILES

Please enter your client code here if you have one

Associate Zone

Please enter your USER ID and password if you have been invited to rate Someone

USER ID

PASSWORD

Instrument Overview

Click here for a list of all instruments on this site

Help

Click anywhere on 'Testing Times' to enter the best testing/psychological profiling bulletin board on the web

TESTING TIMES

best practice bulletin board for the world of organizational measurement and testing

WHERE DO YOU WANT TO APPLY A PROFILE?

JANUS

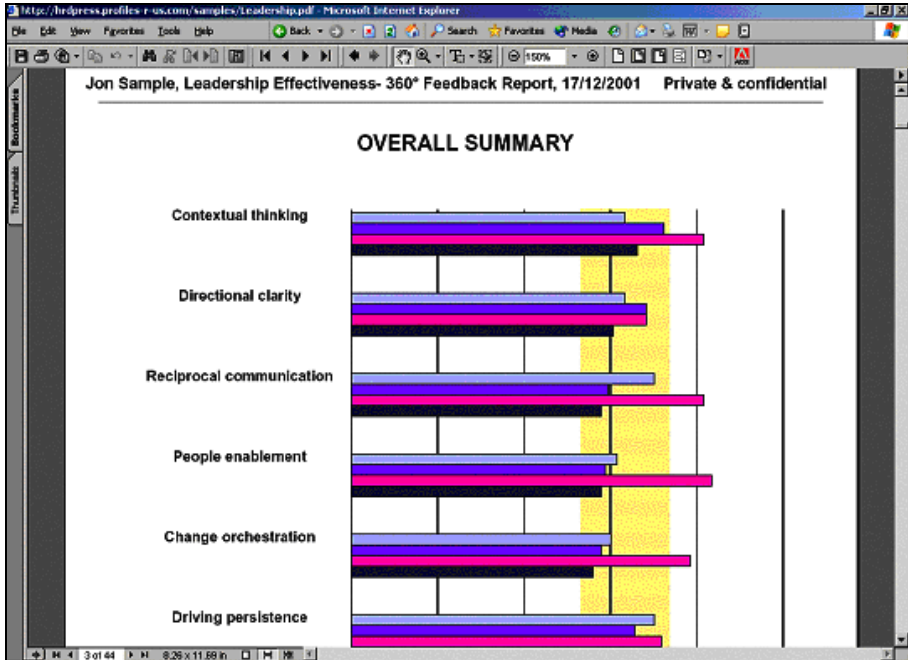
Copyright © Profiles-r-us.com 2001
Privacy Policy

Learning profiles like these offer a cost-effective, easy-to-implement way to blend eLearning with traditional training in many soft skills areas. Each profile takes less than 10 minutes to complete online; the results are instantly compiled, and a detailed, individualized report is produced, which can also be generated for entire teams or groups. Comprehensive reporting includes:

- Graphed summary of individual results for each competency
- Improvement suggestions
- A 10/10 report detailing greatest strengths and developmental needs
- Course and reading suggestions
- A career development plan template
- Coaching tips
- An informational booklet

At HRD's "profiles-r-us" web-site, pre-packaged Learning Profiles are now available, many of which can be used in self-assessment or in 360-degree mode assessments. Common applications of learning profiles for assessment and eLearning include leadership, diversity, change, coaching, quality, customer commitment, teambuilding, communication, emotional intelligence, influencing style, safety, time management, and others.

These learning profiles can be used to help structure a curriculum at corporate universities, provide a diagnostic capability to uncover training needs within an HR organization, or offer the learner greater opportunity for self-development. In training workshops, these same learning profiles can be used to engage and focus participants through web-based delivery prior to workshop events. They can also be used in conjunction with organizational change initiatives and employee surveys, or to stimulate greater learning and awareness. In this sense, profiles can support performance improvement and appraisals and be linked to knowledge management and transfer activities that lead to self-improvement. The following screen samples of HRD's Learning Profiles are provided here by permission of the publisher.



http://hdpress.profiles-r-us.com/samples/Leadership.pdf - Microsoft Internet Explorer

File Edit View Favorites Tools Help Back Search Favorites Media

Leadership Effectiveness Profile
EMOTIONAL INTELLIGENCE

Emotional Intelligence looks at our capacity to recognize, understand and harness our own feelings and the feelings of others. This category asks the question "How intelligently aware and controlling is the person of their own emotional reactions and of those around them?"

Improvement actions

The low scorer needs to think much more deeply about their own personal style and way of operating, and recognize that it can always be improved or adjusted to suit the styles or responses of people that may be very different to yourself. Being self-critical and recognizing your own shortfalls is no easy task, and will need a sustained effort and lots of support and constructive feedback from others.

Emotional Intelligence	
	-Think deeply about your own personal values and share them with your colleagues
	-Gather the opinions or views of people around you (your supervisor, peers, and team members)
	-Take time to quietly reflect upon how you are perceived and how you personally feel about the feedback.
	-Look to use the feedback to plan how you might modify your behaviour (building on the positives and lessening or eliminating the negatives).
	-Think about what you might be able to do to serve your fellow colleagues and team members more effectively

0 of 44 8.26 x 11.69 in

http://hdpress.profiles-r-us.com/samples/Leadership.pdf - Microsoft Internet Explorer

File Edit View Favorites Tools Help Back Search Favorites Media

Leadership Effectiveness Profile
CONTEXTUAL THINKING

1. Easily perceives how something fits into the wider or bigger picture	
2. Sees events or actions in a new light in a different context	
9. Good at making connections between different ideas	
11. Demonstrates that when things are not clear, clues have to be gathered to find answers	
12. Enjoys looking for patterns in experience	
6. Prefers to remain open and flexible in their views	
8. Scans the environment for issues that could pose a future threat or risk	
3. Strongly aware of trends long before they have a direct impact or effect	
4. Likes to consult widely with people external to the organization	
10. Is intrigued by how large systems or processes operate	

0 of 44 8.26 x 11.69 in

http://inspress.profiles-r-us.com/samples/Leadership.pdf - Microsoft Internet Explorer

File Edit View Favorites Tools Help Back Search Favorites Media

OVERALL COMMENTS FROM RATING GROUP

Emotional Intelligence

KEEP (or continue to do well)

Listening to people on a regular basis
 Taking the time to talk and listen
 This is invaluable to the team
 Recognising that no two people are the same and need a different management style to get the best from them
 Jon thinks about people's feelings before taking actions or deciding (although it could sometimes be for longer!!)

STOP (or do less of)

Jon is often guilty of rushing people into quick action or decisions irrespective of their personal feelings
 Assuming that the whole team values are exactly the same as his
 Sending us articles on emotional intelligence we get the picture
 Riding roughshod over the legitimate views of some team members
 Listening to some people (who he sees to be more emotional 'tuned in')

31 of 44 6:26:11.69 in

http://inspress.profiles-r-us.com/samples/Leadership.pdf - Microsoft Internet Explorer

File Edit View Favorites Tools Help Back Search Favorites Media

Jon Sample, Leadership Effectiveness-360® Feedback Report, 17/12/2001 Private & confidential

DEVELOPMENT PLAN

Use the space below to write out your personal development plan for the next 12 months based on your results. Draw upon the general improvement actions in relevant areas of the report and ideas that are suggested in the attached coaching tips.

Development Area: Thinks that finding time to quickly reflect and synthesize information is critical	3.0	3.0	3.0
Action to Take:	Target Date:		
Development Area: Prepares a full justification and impact case for significant change projects	3.0	3.0	2.0
Action to Take:	Target Date:		
Development Area: Listens enthusiastically and positively	3.0	3.0	2.0
Action to Take:	Target Date:		
Development Area: Learns from mistakes, treating errors as opportunities for learning rather than regret	3.0	2.0	2.0
Action to Take:	Target Date:		
Development Area: Generates a clear personal vision of what the future could be like	3.0	3.0	2.0
Action to Take:	Target Date:		

39 of 44 6:26:11.69 in

THE '10/10' REPORT

		scores		
		Self	Sup.	Coll.
Top 10 strengths according to supervisor				
Creative assimilation	11. Sees conflict or problems as an opportunity to find a new solution	3.0	5.0	3.0
People enablement	1. Likes to encourage people to come up with their own conclusions	5.0	5.0	3.7
People enablement	7. Gives people plenty of room to stretch themselves and learn different skills	2.0	5.0	4.0
People enablement	9. Follows through on personal promises and commitments	2.0	5.0	2.7
People enablement	10. Can be relied upon	3.0	5.0	2.3
Change orchestration	1. Looks for opportunities for step change interventions as well as continuous improvement	3.0	5.0	2.7
Change orchestration	10. Reviews and revises the assumptions that underlie any significant change plan	3.0	5.0	3.0
Reciprocal communication	4. Likes to grab people's attention to focus them on the important issues in a discussion	2.0	5.0	3.7
Reciprocal communication	5. Able to get complicated ideas across clearly	4.0	5.0	2.7
Reciprocal communication	6. Communicates excitement about future possibilities	4.0	5.0	2.3
Top 10 development needs according to supervisor				
		Self	Sup.	Coll.
Creative assimilation	4. Thinks that finding time to quietly reflect and synthesize information is critical	3.0	1.0	3.0
Directional clarity	2. Generates a clear personal vision of what the future could be like	4.0	1.0	2.7
Creative assimilation	3. Believes that it is more important to find key information than to have all the data	3.0	2.0	3.0
Creative assimilation	12. Encourages people to make decisions based on facts wherever possible	4.0	2.0	2.7
Emotional intelligence	1. Believes that leadership is about serving others	1.0	2.0	4.3
Emotional intelligence	9. Learns from mistakes, treating errors as opportunities for learning rather than regret	4.0	2.0	2.3
Driving persistence	10. Challenges mediocrity whenever and wherever it is in evidence	4.0	2.0	3.0
Directional clarity	1. Believes that people's energy needs a clear direction in which to flow	5.0	2.0	4.7
Directional clarity	3. Can explain a mission or purpose in the most basic or simple terms	3.0	2.0	2.7
Creative assimilation	2. Brings creative approaches to decision making	2.0	3.0	3.7
Top 10 strengths according to colleagues				
		Self	Sup.	Coll.
Creative assimilation	1. Analyzes situations widely before the mind is made up	3.0	4.0	4.7
Emotional intelligence	7. Takes time for personal reflection	5.0	3.0	4.7
Directional clarity	1. Believes that people's energy needs a clear direction in which to flow	5.0	2.0	4.7
Creative assimilation	2. Good at seeing unexpected behavior, ideas, ideas, ideas, and concepts	4.0	4.0	4.3

For more information on the HRD Press profiling tools for blended eLearning solutions, please see their web-site at:

<http://hrdpress.profiles-r-us.com>

Change Management and E-Learning (Tom Werner, 2001, Brandon-hall.com)

“To Successfully Implement e-Learning Forget What You Know About Change”

Implementing e-learning means a lot of change. The good news for trainers is that we are involved in it. The bad news is that much of what we know about change is wrong. We believe in getting management support, large-scale implementations, long-term efforts, roll-outs, kick-offs, being change agents, overcoming resistance, accountability, and the four levels of evaluation.

These beliefs are part of our training culture. They are mostly wrong. We need to forget them and adopt new ideas about change and implementation. e-Learning is a chance to reinvent the role of training in the organization. Training can be at the big table now—nowadays e-learning is discussed in the same breath with e-business and e-commerce. We’ve always wanted to be strategic partners—this is our chance. But we won’t be with our traditional mindsets about change. We should approach e-learning implementations from a stronger position. Instead of being staff people looking for vision, hoping for support, and working to please, we need to be business people—forming our own visions, initiating new conversations, and focusing on results. To have your plan for e-learning accepted across the enterprise, here are nine ideas about change to consider.

#1. Forget about seeking management support!
—*Instead, build the business case.*

Joel P. Henning, in *The Future of Staff Groups*, indicts the subservient thinking of traditional staff people: “The only important question at the end of the day is ‘How did it go?’ It is code for ‘Did we please them?’” Henning notes that traditional staff groups spend most of their time soothing, selling, and seeking sponsorship instead of focusing on what they offer the business. His solutions? Stop trying to please in exchange for approval. Be a business rather than a function. Don’t look at senior management as the customer; the operating units should be your customer. Think of senior management as your banker. Don’t look for

support; look for capital, like everyone else in the organization. Discover your clients' business problems. Request capital from senior management to solve those business problems and be prepared to show a return on that capital. Don't expect a place at the table unless you can make a positive impact.

Make the business case for e-learning. What can e-learning do for the business? Where is the most likely business impact, the best relevance and fit? Have a vision. Develop a point of view. Write a position paper. Don't ask your clients for a business case. Don't instruct them to "Link e-learning to the business." Link it to the business yourself. Understand their needs well enough that you can build the case for e-learning.

Learn the facts. How much is spent on training in your organization? What are the best measures of success for training? How many people take which courses? How do managers see that training has helped their business?

Explore some hypotheticals. What if travel for training were cut in half? What if training was accomplished in one-half the time? What if salespeople were to make their first big sale of a new product 20 percent faster? What if the work force learned your new software and were productive 15 percent faster? You may not know if e-learning can deliver these results, but these are the right kinds of questions.

Actions:

Look at the numbers for traditional training in your organization and develop a snapshot of what's working and not working. Study benchmark information to identify how other organizations are focusing on business results, developing business cases, and calculating returns. Develop a point of view about how and where e-learning could help the business and write a white paper. Resolve to approach senior management with "why we need to" propositions, not "do they want to" questions.

#2. Forget about reaction and learning!

—*Instead, focus on business results.*

Kirkpatrick's four levels of evaluation (reaction, learning, behavior, results) are engrained in the training culture. Forget about them for a while. Assume that there is **one** level of evaluation: business results. How might e-learning help your clients' business? How could e-learning be a success factor?

Managers of a business care about results of the business: money, time, and impact. (They don't care about our course evaluations!) They want to do things better, faster, cheaper, easier. Which of e-learning's potential strengths could help your clients' business? Is it global consistency of content? Is it learners being able to learn at the most convenient time and place? Is it learners being able to learn just the chunks they need? Is it easier identification of who has what competency? Is it the opportunity to test and require mastery? Is it the use of simulation? Is it having access to a wide range of outside content? Is it some other capability or feature of e-learning?

Don't let measuring business results become a paralyzing activity. You don't have to build a balanced scorecard or measure fuzzy intangibles. Just ask your client what's important. The client's answer will probably point to people creating a business result faster or better, or obtaining the same learning faster, more cheaply, or conveniently.

Surprise your clients by not playing into the stereotypes about trainers. Don't act like your biggest concern is whether people like e-learning. Don't act like e-learning would be a staff project that they should support. Propose e-learning as a business strategy, not a training project.

Actions:

Only start e-learning where a business result is clearly targeted. Focus on business results (Level 4) evaluation. Only look at behavior, learning, and reaction in the context of ensuring business results.

#3. Forget about roll-outs!

—*Instead, create “pull.”*

The 1980s and 1990s were the golden age of organizational improvement roll-outs. (Insert your list of rolled-out initiatives here!) In a roll-out, we typically form a plan for broad (simultaneous or staggered) implementation, make or buy content, set goals and timelines, conduct training and other events, track progress, and have follow-up reviews.

The roll-outs of the 1980s and 1990s sometimes produced benefits (you be the judge), but they also produced resistance and “program fatigue.” “Flavor of the month” became a universal expression. Cynicism was raised to an art form (I still smart from a Dilbert cartoon about “qualicide”).

Roll-outs are based on two highly questionable mindsets: rationality and directiveness. The rational mindset assumes that if we can just define the right steps clearly and persuasively enough, people will do them. The rational mindset misses soft, squishy things like fear, loss, and uncertainty—the emotions that fuel resistance.

The directive mindset assumes that we can actually roll things onto people. In the directive mode, we decide what should happen to other people and how to do it to them. The directive mindset misses the precariousness of line-management accountability (see number 4 below).

Instead of rolling e-learning onto people, think about pulling them in. Nancy J. Lewis and Peter Orton have written about the power of Everett Rogers's research on the diffusion of innovation (*Training and Development*, June 2000). Everett Rogers spent decades studying the adoption of innovations, from hybrid corn in Iowa to modern math in Pittsburgh and snowmobiles among the Lapps in Finland. Rogers identified five factors that pull adopters toward innovations:

1. **Advantage.**
The new thing has to be better than other alternatives.
2. **Compatibility.**
The new thing has to feel familiar and fit my beliefs.
3. **Simplicity.**
The new thing has to be simple to use.
4. **Trialability.**
The new thing has to be easy to try.
5. **Observability.**
I have to be able to see other people's positive results from it.

Lewis and Orton describe how IBM has applied Rogers's concepts to its Management Development e-learning effort. Notice how the effort differs from a traditional rollout:

1. **Advantage.**
IBM Management Development offers Quick-Views—instant online briefings on 40-plus leadership and people-management topics. They are easy-to-access, available as needed, and allow classroom sessions to focus on discussion rather than presenting information.

2. **Compatibility.**
IBM Management Development sites replicate the look and feel of Lotus Notes, the standard IBM interface.
3. **Simplicity.**
IBM Management Development sites require no plug-ins. Ease of use is the top priority in design.
4. **Trialability.**
IBM Management Development allows free access to all sites without passwords or personal tracking so that learners feel safe and comfortable.
5. **Observability.**
IBM Management Development implemented Quick-Views first so that learners would experience immediate solutions to practical problems. Instead of pushing e-learning onto people in a roll-out, consider how to “pull” them to it by making e-learning easy to adopt.

Action:

Apply Rogers’s model to your e-learning initiative. How could you “pull” adopters?

4. Forget about accountability!
—*Instead, focus on engagement.*

Line-management accountability has always been the Holy Grail for trainers. We want senior managers to make training matter through a combination of direction, reward, and pressure. Relying on line accountability as a way to drive change is iffy. We fantasize that senior managers can “make” people embrace new approaches to learning. But it’s a shaky approach. First, it’s unlikely that senior managers will wield significant consequences on behalf of our latest initiative. There are so many other meat-and-potatoes issues that they need to use their influence on. Second, people know so well how to resist accountability—articulate excuses, vicious compliance, “checking off the boxes,” criticism of the initiative, and cries that “we’re different,” to name a few. Third, accountability mechanisms “paper over” what really needs to happen—people have to decide they are going to make *real* changes. We need dialogue more than consequences. Don’t try to *make* people embrace

e-learning. Talk about reality—the situation, gaps, opportunities, and possible solutions.

Engagement means real conversations. Peter Block in his recently updated classic *Flawless Consulting* states that engagement means high-intensity participation, not just briefing people on what they're supposed to do. Engagement means focusing on the problem more than the prescription, allowing real choice instead of “slam-dunking” an initiative on people, admitting doubt about the potential solution rather than promising perfection, structuring ways for people to have conversations, not just hear speeches.

Action:

Have real dialogues with your clients about the business and how e-learning might help.

#5. Forget about large scale!

—*Instead, implement where the need is greatest.*

When we think about change, we tend to think about broad, universal application—let's start at the top, cascade this out, get everyone walking the talk, and make this a way of life. We want to do something big. We imagine sweep, momentum, and ubiquity. We're afraid that small efforts will be piece-meal and disjointed. The problem with big scope is that we're not conscious enough of risk. We're too ready to spend other people's time, money, and effort when need and readiness may not be there. We're not afraid enough of failure and not concerned enough about true fit.

Cultures don't change when everyone is forced to do something at the same time. Cultures change when pockets of people find success and the word spreads. We should look for where the need for e-learning is greatest. Who has a capability problem that traditional training has trouble addressing? Look for the fit. Where are measurable business results most likely to come? Where is skill development most related to business success? Where is traditional training most inconvenient, most expensive, and least effective? Where are resources available? Who's ready?

Action:

Identify where the need is greatest for new ways of learning.

#6. Forget about being a change agent!

—*Instead, build a change agency.*

Organizational development is heavily influenced by counseling theory. So we tend to envision the lone change agent gradually persuading the client organization. One-on-one skills are important, but don't think of yourself as a priest or therapist. Don't be a loner; be in cahoots with others. Build a coalition. Set up a network. Form alliances. Be the underground railroad! Don't look upward to senior management. Look sideways for the oddballs, the experimenters, and the discontented. Think insurgency, syndicate, and community! Break down silos and build bridges to other groups. Be an ambassador, dealmaker, and networker.

Who's got a business problem that e-learning could help? Who can benefit from your skills? Who do you need? Who has parallel interests? Who has passion for change, for learning, for technology? Who is working on knowledge management, quality, teamwork, speed, service, or global consistency? What enterprise-wide projects are underway? Who's tired of traditional training? Who would fund an experiment? Who wants to be a pioneer? Who might be better off with imperfect e-learning instead of "perfect" traditional training?

Actions:

Contact interested clients and colleagues and stay connected electronically and in-person. Initiate conversations with your IT department and form a partnership. Connect with e-learning people in other organizations as well.

#7. Forget about kick-offs!

—*Instead, communicate with frequent, specific messages.*

Was there a kick-off for fax machines? For using cell phones? For using palm computers? Who knows and who cares? It wasn't the kick-off that mattered. Kick-offs meet the emotional needs of the kickers (to feel special), not the needs of the receivers. People don't get excited at initial events. People get excited when they sense a movement in progress. Kick-offs just give people a reason to say, "That doesn't apply to me," "That won't work," or "This looks like another flavor of the month."

Skip the kick-off. People don't need excitement; they need to be educated. Just start telling people what's available in e-learning. Show

people a demo. Tell people what successes others have had, including competitors. Explain how e-learning can solve a problem for them. Send frequent, targeted messages to specific groups about specific e-learning solutions.

Action:

Send regular, specific communications about e-learning.

#8. Forget about taking years to change!

—*Instead, focus on speed and quick wins.*

We know the phrases—it takes a long time to change a culture, we have to be in it for the long term, it's a journey. While those ideas may be true, they're not very helpful. In the 1980s it was common for people (including me) to say that it takes years to change a culture. It was meant to be comforting. Traditional organizations seemed so intractable and opposed to new ideas, it seemed necessary to say, "There's no magic bullet; change takes a long time."

The problem with the slow-change concept is that it removes our sense of urgency. We end up working slowly and our audience doesn't see anything happening. Cycle time has to matter to us just like it does to our constituents. We have to live on Internet time too. There was a time when we took a year to plan a new course, get it approved, build it or buy it, pilot it, revise it, certify the trainers, announce it, and implement it. Trainers lived on organizational time, not business time. That has changed. We have to think about "time-to-market" just like everyone else. Speed counts. Change needs momentum. Figure out how to win early and win often, even if it means winning small, with e-learning.

Actions:

Plan for quick wins with e-learning. Slash cycle time in the development of e-learning courses.

#9. Forget about overcoming resistance!

—*Incorporate resistance.*

What if we encounter resistance to e-learning? What if enrollment rates or completion rates are low? What if people are put off by e-learning technology? What if people miss the classroom?

We will instinctively want to overcome the resistance. “Overcoming resistance” is usually code for one of two things: selling the idea harder or telling senior management. In the face of resistance, we’re tempted to pitch the concept better or put down the rebellion. Overcoming resistance usually really means silencing the resistance.

But we can’t just ignore or put down resistance. As Peter Block has famously said, “Resistance means something important is going on.” We need to note the resistance, talk about it out loud, and listen to what the resisters are saying. People usually resist if their senses of competence, control, credit, or comfort are being “pinched.” Be conscious of how e-learning might offend someone’s sense of competence. How might it take away their sense of control? How might it make them feel robbed of credit? How might it make them uncomfortable?

Empathize by realizing your own resistance. Remember that feeling when you refused to use a new piece of software because you didn’t want to have to learn it. Remember the feeling when you first thought your job as a trainer might go away. Remember when you thought no one realized how hard training really is. Remember that feeling when someone tried to tell you how you should run your training class. Incorporating resistance into the dialogue means talking out loud about objections, feelings, and opinions. It also means remembering to give credit, share information, and involve others in planning and implementation.

Actions:

Use resistance as something important to talk about, not something to be overcome. Expect resistance when e-learning pinches people’s senses of competence, control, credit, or comfort.

Summary

We need to forget those old ideas about change that never worked that well anyway, such as seeing senior management as the customer and seeking management support as the driver for initiatives; treating the four levels of evaluation as being of equal importance; using roll-outs as the vehicle for implementation; relying on accountability to motivate people to accept change; planning large-scale, blanket change efforts; thinking of change agents as lone individuals; using kick-offs as a way to create excitement; taking years to implement change; letting “overcoming” be our natural response to resistance.

Instead, we need to build the business case for e-learning; document business results (Level 4) as the way to evaluate e-learning; create “pull” by making e-learning easy to adopt; have real dialogue with people about their business and learning needs; build a change agency by building a coalition among likely clients and colleagues; communicate frequently and specifically to inform and educate about e-learning; move fast and get quick wins with e-learning; talk openly about resistance, and the reasons behind it, instead of trying to conquer it.

Let’s use e-learning to change training’s typical role, image, and modus operandi. Let’s change ourselves and the traditional culture. Let’s stay at the big table by focusing on the business.

Tom Werner is a researcher and consultant with brandon-hall.com. Tom can be reached at tom@brandon-hall.com.

References and Helpful Readings

Block, Peter, *Flawless Consulting (Second Edition)*. (San Francisco: Jossey-Bass/Pfeiffer, 2000).

Lewis, Nancy J. and Peter Orton, “The Five Attributes of Innovative E-Learning,” *Training & Development* (June 2000): pp. 47–51.

Henning, Joel P., *The Future of Staff Groups* (San Francisco: Berrett-Koehler, 1997).

Kirkpatrick, Donald L., *Evaluating Training Programs (2nd Edition): The Four Levels* (San Francisco: Berrett-Koehler, 1998).

Rogers, Everett M., *Diffusion of Innovations (Fourth Edition)* (New York: Free Press, 1995).

Centra’s Blended eLearning Guide

The following “Blended eLearning Guide” was developed by Harvi Singh and Chris Reed at Centra Software with the intent of providing a tool that would help decision-makers and system designers get started with successful blended learning solutions. This tool is part of a larger white paper that is excerpted in Chapter 10 and available from the authors at the Centra website. Below is the authors’ explanation of how the guide should be used, followed by a reprint of the actual tool itself.

How Do You Get Started with Blended Learning?

You need to approach blended learning as a journey rather than a destination. The first steps along the journey are to build experience with the individual foundations of any blended learning strategy—self-paced learning content and live eLearning—to understand their strengths and weaknesses in your business context. The good news is that this first step has consistently demonstrated quick financial paybacks and strong user acceptance. The next step is to begin experimenting with the “dimensions of the blend” discussed in this paper. Use the guide to help you focus your design. You may find it useful to implement learning content management capabilities that enable you to link together self-paced content and live learning activities into managed blended learning programs. When you select your first blended learning project you should approach it as you would any significant organizational change by insuring the following project criteria can be met:

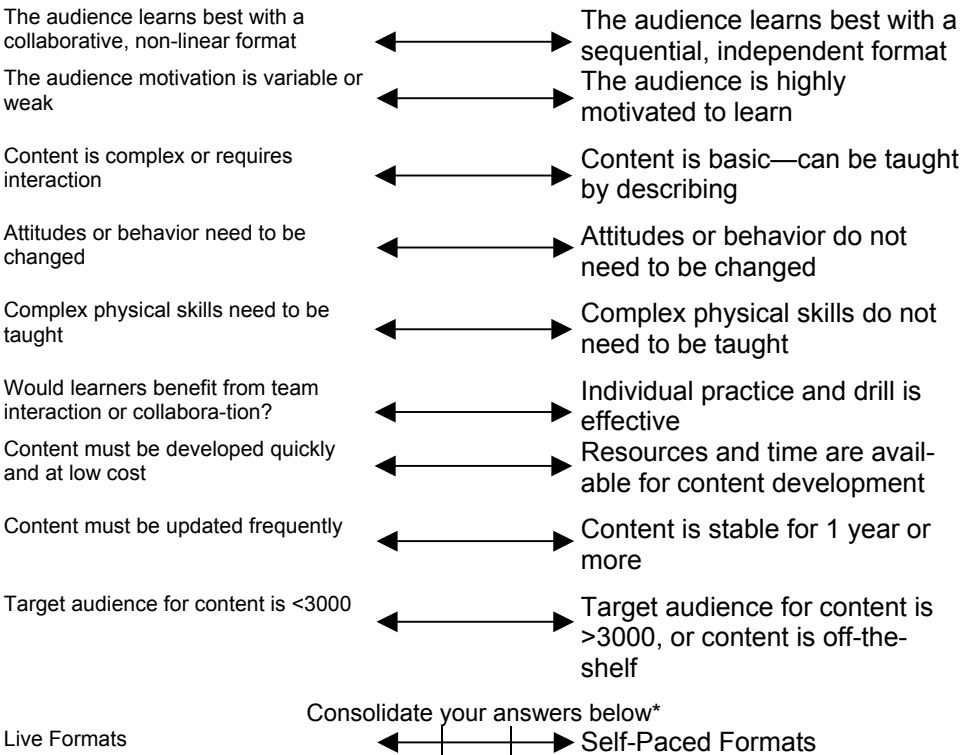
- Clear, High Value, Business Justification Case—to achieve executive sponsorship
- Executive Sponsorship—to provide the resources and management support required
- Committed Project Team—to execute project regardless of obstacles
- Change Management Strategy—to anticipate and overcome resistance to change
- Responsive Vendors—to provide resources and expertise for your success
- A Deadline—to maintain focus and commitment

A Blended Learning Strategy Guide

The following tables are a guide for identifying what general types of learning delivery formats meet the different needs and constraints your organization might face. In the majority of cases, you will find that no single delivery mode is optimal, but this should give you a good sense of the relative balance of formats that will best fit your audience. The analysis has two phases: identification of the weighting of focus between live and self-paced delivery models, and then a further mapping to the most appropriate delivery formats within each of these models.

Step 1: Delivery Model Mapping

Plot your answer on this scale



*Represents the consolidated results as a distribution on the line rather than a point—unless your results fall uniformly at one end of the spectrum, you are likely to benefit from a blended design.

Step 2a: Delivery Technology Mapping—Live Formats

Plot your answer on this scale

Learners have the same base knowledge	←————→	Learners have different base knowledge
Learners are in a central location	←————→	Learners are distributed or mobile
Learning program has stable learner throughout	←————→	Many learners must be trained in a short time
Learning is most effectively delivered in a single session	←————→	Learning is most effectively delivered over time, or interweaved with job experience
Learners have schedule flexibility to attend class	←————→	Classes must adapt to learner schedules
High resistance to attitude or behavioral change	←————→	Low resistance to attitude or behavioral change
Complex physical skills need to be taught	←————→	Complex physical skills do not need to be taught
Remote expert or peer access not important	←————→	Remote expert or peer access important
Learner convenience is not important	←————→	Learner convenience is important—time in training, cost of travel
Availability of learning outside class not important	←————→	Self-paced viewing or reuse of live class content valuable
Learners do not have access to PCs	←————→	Learners have access to a PC with at least dial-up connectivity.

Consolidate your answers below*



*The weighting of the distribution will be a guide to the likely optimal mix of physical and virtual classroom delivery.

Step 2b: Delivery Technology Mapping—Self-Paced Formats

Plot your answer on this scale

Subject matter requires a complex, prerequisite skills/knowledge set to be acquired before its application	←————→	Subject matter/content does not need to be accessed in a structured path, content may be accessed in chunks on an as-needed basis
Content needs to be presented independent of the actual work situation	←————→	Content needs to be linked to a business process, software application, or job-task
Access to online content is not available during job task/ performance	←————→	Online content is readily accessible during the job task performance
Instructional designers are available to map out the course content with media, interactive elements around course objectives	←————→	Content is available in job aids and document format created by subject matter experts (non-instructional designers and web content designers)
Learners are motivated to complete structured course content in an online/web-based format	←————→	Learners are unlikely to complete full-length online courses and need just-in-time information
Adequate time is available to master the content in a structured format before skill/ knowledge application	←————→	Content needs to be made available without lead time to master the content prior to job-task performance
Learners do have the opportunity to schedule concentrated/dedicated time to learn online	←————→	Learners must remain on the job and may have bursts of time available for content access and reference
Assessment and completion or tracking is a necessary component of training	←————→	Content needs to be accessed more for reference than for compliance or assessment

Consolidate your answers below

Self-Paced Courses

←————|————|————→ On-Demand/EPSS

Chapter 8

LMS Strategies for Human Capital Development and Management

Overview

To enable the link between learning, knowledge, and performance, infrastructure elements must be put into place to leverage learning and extend its reach to the enterprise level. Learning Management Systems, as we have mentioned before, have traditionally been used for managing people's training records, but more recently they have been used to track other vital HR information and to help manage performance. This emerging discipline is often referred to as Human Capital Development and Management (HCDM) or sometimes just HCM.

Moreover, new capabilities are allowing these HCDM systems to provide a full-service learning portal, or a starting point for accessing all types of learning, such as peer collaborations, instructor-led training schedules, synchronous virtual classroom sessions, asynchronous self-paced courses, mobile content solutions, integration with other enterprise systems, access to knowledge management systems, and links to performance support elements like job aids and personalized agents. Linking to this wide variety of outside systems and capabilities is sometimes called Integrated Learning Management Systems (ILMS).

In this chapter we'll begin to explore the trend toward ILMS systems and HCDM through a Saba published white paper. Then, in the middle section of the chapter, we'll examine the various elements of an LMS and discuss its bearing on an

expanded view of blended eLearning that combines the central components of OLL, EPSS, and KM. And finally, at the end of the chapter we provide a case study of Learn360, which is an enterprise class LMS from RWD Technologies[®] that supports Blended eLearning.

Human Capital Development and Management

The Next Generation of Virtual Integration Across the Extended Enterprise*

One of the great advances of the knowledge economy has been the advent of “virtual integration”—the use of Internet and software technology to link together diverse units and processes in organizations to achieve speed, cost-efficiencies, quality improvements and tighter management of relationships and customer needs. In recent years, this virtual integration has dramatically accelerated and enhanced the quality, flow and alignment of goods and services among enterprises and to and from customers. The next horizon of integration will be enhancing the flow, quality and alignment of capabilities of human capital that underscore it all—Human Capital Development and Management (HCDM).

I. Virtual Integration

The virtual integration of goods and services is a phenomenon both within and beyond the boundaries of enterprises. Within enterprises, ERP systems have unified cost management and cross-unit process coordination. Similarly, cross-organizational process software has accelerated up the movement of goods and inventory management across entire supply chains; and CRM systems have enabled more responsive and coherent management of the “demand chain”—resulting in holistic customer relationship management. This technology integration has allowed enterprises to focus on their core competencies and engage flexibly across their extended enterprise of customers, partners, employees and suppliers who can similarly focus on their distinctive strengths. It is also bringing customers more closely into the planning and development of products and services, as information is instantly processed through state-of-the-art information networks.

*Excerpted and reprinted by permission of Saba Software, Inc.,
Copyright © 2001.

The knowledge economy is driving enterprises to pursue this integration in response to hyper-competition. Globalization, deregulation and technological advancements have empowered business and consumer buyers as never before—while at the same time forcing enterprises to be more responsive, nimble and distinctive in the value they deliver. Enterprises must continually change—or they will perish. A major part of that change has been the increasing focus of every enterprise on its core competencies, while passing responsibility for other parts of value-delivery to partners and other providers—and then integrating with those partners to provide a superior product or service. Participation in fast-moving and flexible chains of supply, production and delivery have become every enterprise's new imperative. The evolution of competition-driven virtual integration is not only about information flows and technology. The massive changes of such developments are both supporting and being driven by another huge discontinuity with the past; the shift from people as a commodity, or “labor,” to people as the central creators of value.

Human capital is not just an economist's word for “people”; it embodies a range of attributes and processes related to skills, knowledge and their development and application. The advent of the knowledge economy has created human capital as the ultimate source of competitive advantage. So Human Capital Development and Management (HCDM) is the logical and all-important next step beyond—and at the same time, critical to—the virtual integration of goods and services.

Unfortunately, in most enterprises, HCDM lags behind the other advances of virtual integration. Managers have yet to encounter a system that effectively manages the learning, performance, content and resources of their all-important human capital across their extended enterprise. Without an HCDM system to integrate the management of these needs managers are wrestling with numerous HCDM challenges, such as:

- “We're rolling out twenty new products every month; how can I get my channel distributors up to speed faster, so they can sell through greater volumes and still protect my brand?”
- “My greatest margins come from selling to national accounts; how do I develop the skills and capabilities across my enterprise to leverage the Fortune 500 relationships we have in multiple geographies?”

- “We’ve beaten every other airline in on-time departures which has boosted our customer satisfaction. How do I ensure that my baggage handlers remain in compliance with FAA regulations now that they’re loading more suitcases, faster?”
- “I can reduce costs another 10% if my suppliers better understand the specs of the new engine we’re building; how do I most efficiently train the engineers of the three enterprises filling the parts orders?”
- “The pivotal job in our enterprise that drives all growth is brand manager. How do I provide people in this role with professional growth to increase retention of the best performers?”
- “Somewhere in our enterprise or network of partners there are people with the expertise to solve this critical technical problem. How can I find the people with the right knowledge when it’s needed?”
- “We’ve managed our inventory from weeks down to days—but my people lack the leadership skills to motivate their teams, and our partners, to adapt to the new way of working.”

These are tough and demanding challenges, and do not yield to simple solutions. Leading enterprises as diverse as Cisco, Caterpillar, EMC and Procter & Gamble are tackling such problems head-on with a strategic and integrated approach to HCDM that is well beyond traditional back-office efforts of administrative HR or training. A big part of the new strategic approach is using HCDM to manage the skills, capabilities, deployment and development of people with the same virtual integration of information used in streamlining supply and demand chain systems. They are using the new generation of Saba HCDM solutions to:

- Align goals and efforts of employees, suppliers and partners to continuously eliminate wasted effort and improve customer satisfaction
- Speed the transfer of knowledge across their extended enterprise
- Certify that employees, suppliers and partners meet compliance requirements
- Track, grow and motivate, and thus retain, key people

- Ensure that people have the competencies required for maximum performance

Pursuing an integrated HCDM strategy that embraces not only the enterprise itself but also customers, partners, employees and suppliers is a challenge. It requires a deep understanding of the value opportunities and barriers that must be overcome, and an investment of significant resources. To gain a complete understanding of these needs requires a background on the strategic context for HCDM, analysis of its key elements and knowledge of the barriers to progress in achieving an integrated HCDM solution. Against the backdrop of these barriers to HCDM it becomes easier to see how Saba works together with leading enterprises to implement successful HCDM strategies, and how your enterprise can start down the road to the future.

II. Strategic Context: HCDM and the Economics of the Knowledge Economy

The twin forces of technological change and globalization have created a hyper-competitive and increasingly global economy—one in which rapid change is an unrelenting fact of life, customers are increasingly demanding and fickle, inefficiencies and waste are systematically being eliminated, and product prices are continuously being challenged. Simply by looking at the rate at which firms have disappeared from the Fortune 500, it is easy to understand the price that is paid for being unable to adapt to the demands of the knowledge economy.

In the knowledge economy, human capital is both a cost that must be managed efficiently and an asset that represents the only sustainable source of competitive advantage. Hence, the efficiency and effectiveness of Human Capital Development and Management will increasingly distinguish winners from losers.

This unique juncture of economic history has created a high premium on human capital. Firstly, there is a premium on talent—as barriers come down, markets globalize, and innovation and flawless execution distinguish winners from losers, the distinctive edge is increasingly found with enterprises that have superior skills and capabilities in their extended enterprise. Also, because of the massive discontinuities and change in the knowledge economy, there is an additional premium on building new skills and capabilities—learning how to do things better, cheaper, faster. Simply stated, change cannot happen without learning. As a result, eco-

conomic success is being enjoyed by those who have the best skills, and the best ability to learn quickly. Not surprisingly, then, the return on individuals' investment in education—either in terms of higher wages in the United States or lower unemployment in European nations—has increased. It is also why enterprises that have made the largest investments in learning have out-performed their competition on a wide variety of measures of financial outcomes—including total stockholder return.

III. Measuring the Value of Human Capital

The world's best enterprises make huge investments in HCDM. The most visible cases are professional services firms that are “pure people plays.” With leading firms, such as Accenture and McKinsey & Co., spending as much as 8 to 10 percent of payroll to develop their people, the first place to see the impact of HCDM is in the costs of training and education.

Unfortunately, the return on these investments may be obscured because the tracking methods employed do not, for example, normally include the indirect cost—compensation or overhead—or the opportunity cost—lost productivity of learning. Nor do they include investments in informal learning, such as on-the-job training, coaching, mentoring, or cross training. There are also the additional costs of superior recruiting, strategic deployment and professional development through staff rotation that must be taken into consideration.

When all these factors are taken into account, it is not difficult to see the “human capital costs” across any given enterprise come to between 20 and 30% of payroll. Manufacturing and resource intensive enterprises are also increasing their investment in human capital at unprecedented rates, recruiting at the best business schools, and increasing their focus on both sourcing and developing superior performing people. As the new CEO of General Electric said, responding to the question of GE's impressive corporate performance over so many years: “The answer is simple: we hire great people, train 'em very well, and keep them.” Indeed, the GE story is not surprising; employees in all industries have come to understand that the quality of the development opportunities available to them will determine their future wages and employability, and the best are attracted to and remain at enterprises that make significant investments in them. Great enterprises attract, develop and leverage great people—and hold on to them year after year.

Maximizing the value created through human capital development of employees is, however, but one piece of the puzzle. Taken together, the “people costs” across any given extended enterprise come to about 70% of all costs for most businesses. An increased focus on core competencies, and the resultant reliance on outsourcing, means that human capital must now be managed throughout the extended enterprise—including not only employees but also an enterprise’s customers, partners and suppliers.

This means that even the human capital of customers must be managed if enterprises are to avoid the perils of having their products and services become commoditized. To do this, leading enterprises are creating loyalty among their customers by providing them with the skills and knowledge required to get the maximum value from the products being sold to them. In turn, by leveraging the skills and insights of customers to co-design superior and innovative products and services, leading enterprises co-opt their customers to invent a more profitable future, together.

Human Capital is not just an economist’s word for “people”; it embodies a range of attributes and processes related to skills, knowledge and its development and application. But what are the key elements of Human Capital Development and Management and what might an integrated HCDM solution look like?

IV. The Key Elements of HCDM

At the most fundamental level:

- Human capital is what people know and are capable of doing with their knowledge
- Human capital development is about enhancing that capacity
- Human capital management is about maximizing the value that is embodied, or created, through people’s capacity to contribute. Working from this understanding, it can be seen that there are four major components for a HCDM solution.

1. Learning Management

This is the process through which learning content is matched to the personal needs of knowledge workers, thereby enriching human capital. These processes range from determining the knowledge requirements of

a person, then suggesting how to build that knowledge using traditional learning formats such as assignment and attendance of classroom training or eLearning courseware, to non-traditional sources such as participating in a community of practice or seeking advice from an expert colleague. From a learner's perspective, an LMS must include technology that enables catalog browsing, learning registration, competency and certification management, testing and assessment, and chats and discussions. From a learning provider's perspective, capabilities that the LMS must include are education planning and registration. Also, the ability to market and sell learning, transact commerce and optimize the use of resources such as classrooms, instructors and computers as they do so is needed.

2. Performance Management

This is the process of maximizing performance and value of an enterprise through strategic alignment, and continual visibility into individual and enterprise-wide performance, thereby providing real-time feedback and opportunity for development. The process of performance management includes goal setting, cascading, alignment and status reporting; competency and certification management and links to goal attainment; reward management and objective performance input. Performance management solutions facilitate the integration of information about all these processes, thus enabling maximum alignment and efficiencies. Superior performance is the intended outcome of a Human Capital Development and Management strategy, to which effective learning content and resource management contributes.

3. Content Management

This is the process of creating, developing, capturing, assembling, publishing and delivering the knowledge content that empowers productivity within an extended enterprise, and reporting on content utilization and effectiveness. Content management solutions facilitate the integration and automation of these processes, empowering enterprises to get the most value of relevant content through appropriate reuse. Content exists in multiple forms including instructor-led courses, books, self-paced learning curricula, electronically delivered courses, white papers, libraries of learning objects, simulations, knowledge exchanges and communities of practice. Content is also manifested in technical blueprints, maintenance manuals, operating procedures and organizational policies. The challenge in managing the depth and breadth of

content in an enterprise is to link it to key business processes, and ensure that the right content is available to the right individual in the extended enterprise when it is needed. Regardless of form, content represents “knowledge capital” in an enterprise. It might be explicit and codified, or tacit; it may be dynamic, based on the interactions of knowledge workers, or static; it may be community-based or resident in an individual. Knowledge capital is transferred both formally—in classes and via books—as well as informally—through collaboration with subject matter experts and in communities of practice. The most effective content management systems are those that can capture knowledge content that is both formally and informally transferred, categorize it in a meaningful way, and let users personalize their view of it, using appropriate filters. Ensuring capture, simple access and reuse of all knowledge capital within the extended enterprise increases its value and eliminates redundant content creation efforts.

4. Resource Management

This is the process of efficiently deploying human capital throughout the extended enterprise to plan recruiting needs, develop succession plans for critical roles, assess the impact of reorganizations and even locate experts for collaboration or temporary help. The processes of Resource Management include modeling the current and desired state of an enterprise based on competency requirements; locating, collaborating with and assigning subject matter experts to opportunities; determining resource needs to guide recruiting efforts and improving resource utilization and overall business performance. The most effective HCDM solutions are those that recognize and address the necessary interrelatedness of Learning, Performance, Content and Resource Management to an enterprise, and efficiently integrate their processes.

An additional complexity of effective Human Capital Development and Management is the need to address multiple interconnected groups of people who collaborate across the boundaries of large global and virtual enterprises. That is why the four components discussed above must cover and embrace each of the following segments of any extended enterprise:

Customers

As product and service complexity rises, so too does the requirement of getting appropriate knowledge to customers. In addition to providing learning to customers, learning from customers has taken on growing importance. The two-way street of customer learning is increasingly an avenue for enhancing customer loyalty and retention.

Partners

HCDM solutions for customers apply equally well to the enterprise's strategic partners. Partners co-develop, co-create and ultimately co-deliver products and services. Strategic partners must constantly upgrade the skills and capabilities of their human capital, and align them for the good of the customer. Anheuser-Busch, for example, does not allow its beer to be sold by distributors who do not agree to training courses in handling their products and brand.

Employees

The need to develop and manage an enterprise's employees is obvious, but often the outcome of doing so is not. Employees are the face of your enterprise to the public. Their knowledge of your products and services, as well as your goals and culture, are key to making it a success. Studies show a direct correlation between investment in learning and development activities to employee satisfaction and retention, as well as customer satisfaction. Increasingly, the war for talent is won by those enterprises that invest the most in their human capital.

Suppliers

As enterprises shed activities that do not align to their core competencies, the need to have suppliers actively involved in the business has increased. Ensuring the enterprise's objectives are met increasingly requires providing opportunities for developing the supplier's organization as well as your own. For example, Dell Computer depends on the skills of Intel workers, just as Ford Motor Company depends on the skills of brake, muffler and tire suppliers that contribute significantly to their finished products.

V. Barriers and Progress in Achieving Integrated Human Capital Development and Management Solutions

The evolution of integrated Human Capital Development and Management is proceeding, but the vision has a range of barriers to overcome before becoming operational reality. Some of the most significant barriers have to do with mindset and the recent history of management theory. First and foremost, most enterprises have not had the leadership or resources to really link human capital issues to business problems. For old-style HR departments, and back-office training organizations, training human capital was a limited or “nice to have” set of processes with little or no explicit connection to fundamental business imperatives. Secondly, even when training became more “front-office,” it tended to be pursued in disconnected pieces such as a quality initiative, knowledge management or leadership development initiatives—all well-intended, but lacking optimal impact without the connection to an overall strategy of people, skills, and business outcomes.

The fragmentation existed even more painfully in boundaries between “us” and “them.” With multiple disconnected human capital initiatives and programs, but no integration among them all or beyond their own boundaries, business processes related to human capital were not well mapped or operational across units or across boundaries of enterprises.

Infrastructure, or lack thereof, contributed to this fragmentation. Systems relating to Human Capital Development and Management have rarely been interconnected across an enterprise, much less to customers, partners, employees or suppliers. Data and information about people’s skills and capabilities similarly reside in islands and are difficult for managers to analyze and act on.

The rise of the Internet provided a major opportunity for easier and more seamless connection, but without standards in place, the necessary applications for elements like learning, performance, content and resource management have been difficult to bring together. Also, prior to the rise of the Internet, there was little consciousness, or ability, of enterprises to empower their knowledge workers with easy “self-service” tracking of their own development and growth opportunities.

Fortunately, the situation is steadily improving, as more and more enterprises realize the importance of managing people and their

knowledge strategically. Leading-edge HR and learning organizations are helping to pace the change in many enterprises; in other cases, senior and line executives are taking responsibility to elevate Human Capital Development and Management as a mission-critical priority. Additionally, new infrastructure that leverages emerging technical and content standards is becoming available.

Integrated Learning Management Systems

Following this R & D discussion on HCDM technologies, we will now examine the trend of Integrated Learning Management Systems (ILMS) for enabling blended eLearning solutions. Key trends include the integration of multiple components, the implementation of corporate universities, or organization-wide learning systems, and advanced reporting that allows for the integration of metrics from the LMS into other business systems.

Typical Components: LMS or HCDM Functionality

LMSs should have a minimum set of capabilities for managing the learner and access to learning activities. First, an LMS should have the ability to register and hold key demographics about the learner. A scheduling system for instructor-led classes and classroom management is also a minimum requirement. Most systems can also be used to register students into self-paced classes and provide access to study materials that can be ordered through the system. Most of these systems can link to eCommerce systems, if they do not have eCommerce already integrated. Learners should be able to view their own transcript, and managers/administrators should be able to view demographics, enrollments, completions, scores, financial details about running a class, and additional resource information about classrooms, equipment, and instructor schedules.

Often, LMSs can be used to promote unstructured learning activities such as a single training class for a specialized group of individuals. On the high end, the ability to manage complete curriculum and post courses or class information is a critical

management function for delivery of information in a variety of disciplines, with more than one course manager throughout an entire enterprise. The ability to launch a wide variety of courses and learning activities is also critical to the expandability of the system.

Key features that distinguish an LMS capable of expanded HCDM capabilities include the integrative functions of managing skills, competencies, and enterprise-wide knowledge practices that enable the individual to track performance and growth, and the organization to track development, costs, succession planning, and other advanced HR and business-related metrics as seen in the previous section. Managing skills and skill gaps allows an organization to provide consistent standards for the development of additional skills in individuals. It also provides measurable goals for employees to perform to. Far beyond a training plan, the systems can be used to track job performance, skills, certification, and knowledge combined with training plans, curriculum/course lists, and basic training reports.

Expanded ILMS Services that Enable Blended eLearning

The addition of instructor-led training schedules, synchronous virtual classroom sessions, asynchronous self-paced courses, testing/assessment, mobile content solutions, collaboration, integration with other enterprise systems, access to knowledge management systems, and links to performance support elements like job aids are key enablers for the expansion of an LMS.

The ability to launch and manage many types of training content is critical to an expanded role of the ILMS. Launching and tracking most forms of online content (synchronous, asynchronous, mobile, virtual labs, and assessments) are core requirements for systems that claim to manage eLearning content. The ability to track instructor-led classroom sessions is yet another way in which an expanded ILMS can be used to

further enable blended eLearning both within the training function and in our expanded view of integrated performance support and knowledge management. Let's examine some of the components that allow for EPSS, or KM function.

EPSS and KM Functions in ILMS

Collaboration can be used to provide additional functions to support various learning models like discovery learning, cooperative learning, and expert communities of practice. Collaboration allows for human communication to be integrated into the ILMS through functions such as discussion boards, chat, peer-to-peer, instant messaging, and managed e-mail. Linking people through online systems allows for sharing of best practices, mentoring of individuals who are newer to the discipline, and understanding primitive knowledge management functions. In addition, search capabilities allow learners to easily find information that may have been stored in the heads of experts, rather than found in courses.

Another critical element for the full functioning of an LMS or HCDM system is its ability to link to more sophisticated knowledge bases. Examples include knowledge systems with advanced filtering and advanced people search databases that allow for knowledge sharing outside the domain of courses. The addition of this capability within the system, or as a key link between systems, can help people share knowledge and know where it is housed. With a tight focus on training, this aspect of finding the right information to perform a task is often overlooked if we do not expand the knowledge base outside of the pure training function.

The addition of context-sensitive, just-in-time information enables online performance support and the integration of learning into the everyday job roles of learners/workers. Online job aids and quick look-up of performance information allow for improved performance, even long after a singular training event has been performed. Additional information about techniques

for expanding this performance support function of an LMS or HCDM can be found in Chapter 2 on Performance Support and in Chapter 13 on Wireless eLearning. To enable these things, a system must be able to manage training content and assets, but also manage or link to performance information. Quick reference sections, search capability, and simplified access to timely information are needed additions to allowing blended eLearning that has KM and EPSS functions.

Another growing trend is the desire to have a centralized starting point for finding and organizing learning assets within an organization that is promoting a learning culture. These learning organizations, as Peter Senge calls them in the *Fifth Discipline*, can be enabled through the use of an Online Corporate University. At their core, many Corporate Universities have a sophisticated LMS or HCDM functioning with other technologies for synchronous, collaboration, curriculum management, KM, EPSS, etc., and they also define people and process aspects of delivering and meeting high-end training needs. Corporate Universities, especially those that allow for self-service through an online interface are an expanded function of the learning resources provided within an organization. The integration with other enterprise systems is discussed in more detail in the book's companion web-site. Additional business metrics and learning metrics can be achieved with the data contained in an LMS. The real metrics can be realized by combining this data with other data found in enterprise systems.

The LMS or HCDM system is a core component that should be carefully evaluated to make sure that it can expand to perform the other functions mentioned in this chapter. Of particular interest is the ability to manage learner/performer records as well as link to KM, EPSS, and Enterprise Systems, while enabling a wide variety of learning delivery options.

Case Study: Learn360 LMS Supporting Blended eLearning

Learn360™ is a Learning Management System developed by Latitude360, a division of RWD Technologies®, and is designed to offer a solution to organizations with a need for a standards-based eLearning platform. This section provides a brief overview of the architecture and technologies behind Learn360 in order to illustrate how they support blended eLearning.

Primary Features of Learn360

Learn360 provides full learning management system functionality with support for a variety of learning delivery methods, including:

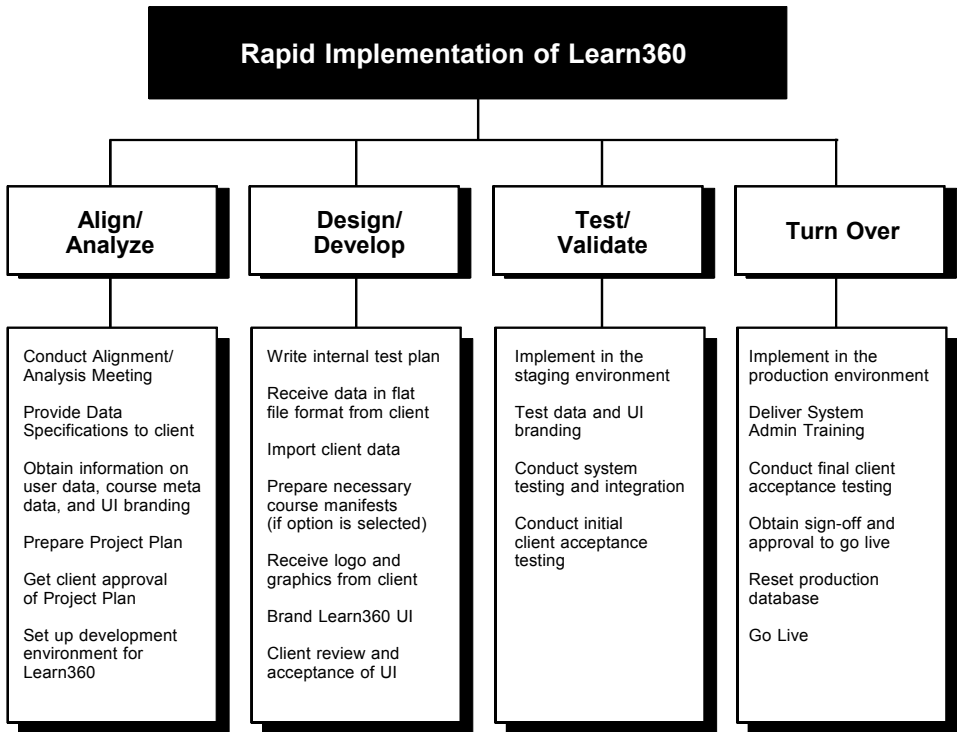
- Self-paced
- Classroom
- Virtual classroom
- Blended

The system tracks and manages learning resources such as instructors, classrooms, computers, and projection equipment, and it monitors and tracks learner progress in real time. Learn360 is designed to provide the following:

- Low cost, high value, implementation
- Rapid deployment
- Support for Courseware Standards
- Easy customization of “look and feel” or branding
- Easy web-based administration and maintenance
- An eLearning platform that can grow with your needs
- Integration with an offline learning product (360Sync)
- Integration with University360 for other eLearning functions

Learn360™ Deployment

The diagram below illustrates the four main stages of a rapid development cycle of the Learn360 platform.



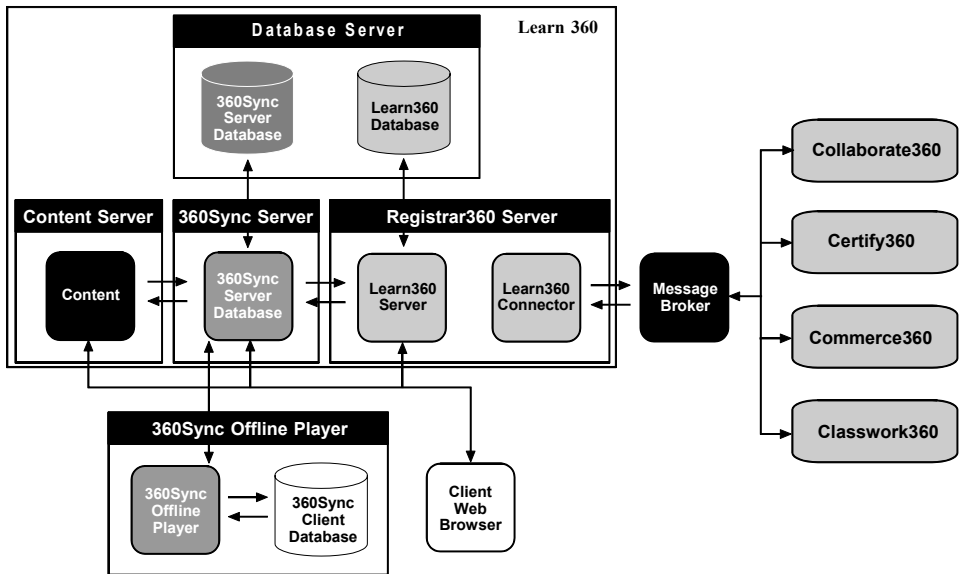
Used by permission, RWD Technologies®

Hosting

Latitude360 also offers Learn360 hosting services. Latitude360 hosting allows the implementation of Learn360 without any of the associated hardware, software, systems, administration, and maintenance costs of a system deployed at a customer's facility. The hosting option is an ideal means of introducing an eLearning environment into a company without the associated issues of IT system procurement, deployment, and time.

Integration with 360Sync and Other University360 Components

Learn360 is already integrated with Latitude360's 360Sync, a mobile learning product offering. This combination of Learn360 and 360Sync allows content to be presented both online and offline and yet still provides an identical user experience. Learn360 also participates in the University360 message broker architecture, allowing Learn360 to become one component in a complete groupware eLearning environment.



Used by permission, RWD Technologies®

eLearning Content in Learn360

Learn360 currently supports SCORM and AICC content, and because it is deployed in a web environment, any content that can be delivered through the web can also be delivered through Learn360 and 360Sync.

Learn360 and Blended eLearning

Latitude360 has provided a learning management system with its Learn360 product. Plus Learn360's integration with 360Sync provides an eLearning experience that is accessible even when learners are not able to be online. Support for the University360 messaging architecture allows Learn360 to work in tandem with other University360 components to deliver a full-feature learning environment. Below is the Learn360 launch page for a Blended eLearning Solution.

The screenshot displays the Learn360 website interface. At the top, it is powered by Latitude360™ and features the Campus360™ logo. A "Log In" button is visible in the top right corner. The main content area is divided into several sections:

- Welcome:** A message stating, "Welcome to the premier site for on-line learning. We offer the following types of training:" followed by five categories, each with an icon:
 - Self-paced:** courses that learners complete at their own speed.
 - Classroom:** training led by instructors for groups of learners.
 - Virtual Classroom:** training that brings live, Internet-based courses to learners around the globe.
 - Performance Support Aids:** that give users access to job aids, discussion boards and collaboration tools.
 - Mobile:** training that delivers online and offline access to courseware for anytime/anywhere training.
- Virtual Classroom Training:** A central section featuring a woman's face and the text "She wants...".
- Products & Services:** A list of links:
 - [eBusiness](#)
 - [eLearning](#)
 - [University360 Overview](#)
 - [University360 Demo](#)
 - [360Sync](#)
- Log In:** A section for users who do not have an account, with a "Create a New Account" button and a "Log In" button.
- What's New:** A section with two news items:
 - [Latitude360™ Launches 360Sync™ the Solution for eLearning On-line](#)
 - [Latitude360™ to Host the AICPA's Learning Center](#)

Used by permission, RWD Technologies®

This page intentionally left blank

Chapter 9

Learning Content Management Systems

What is an LCMS?

Instructional designers and developers are keen on saying that “content is king,” and while this may be true, in order to allow everyone to access the content, you must have an infrastructure that supports accessibility, organization, distribution, and reuse of instructional material. Hence, a term that is becoming more widely accepted is LCMS, or learning content management systems, which provide the foundation technology for creating, managing, and reusing learning content (or learning objects) across courses, curricula, and even an enterprise-wide eLearning supply chain. According to Bryan Chapman of brandon-hall.com, “Everyone is talking about the LCMS trend. We’ve seen recent reports from industry analysts such as IDC, WR Hambrecht +Co and Gartner Group, and by all indications, learning content management systems are the next big wave in eLearning, and rightly so. The products attempt to solve some fundamental business issues that are only partially addressed by other eLearning offerings, such as:

- How do we efficiently produce hundreds of eLearning courses inside our organization (rather than just a few)?
- How do we manage large teams of developers working on eLearning projects?
- How do we leverage content that we’ve already created in future courses or derivative versions of the same

course (e.g., multilingual courses or courses re-branded and adapted for different customers)?

- How do we use the same content for eLearning and simultaneously use it for print-based learning or to automatically re-publish the content as an electronic performance support system (EPSS)?

In this chapter, we explore LCMS technology in greater detail, and more importantly, the whole topic of standards-based content management for blended eLearning. We will also look at examples of how other types of content, besides learning objects, can be managed and used, as well as the influence of emerging standards.

The Basics of LCMS

At its most basic level, an LCMS is a basic building block technology to manage content. Consider having a library of over 1,000 courses available to learners in your organization. If each of those courses had an average of 5 learning objects that make up sections, you could have quite a few independent learning elements that people could want to access. This could translate into 5,000 learning objects. Not every person may be able to get access to a web-based module, so various delivery methods like presentations, CD-ROMs, paper-based materials, and even handheld versions might need to be available to truly meet the self-service needs of your audience. Just this one scenario shows the emerging need for systems to manage content. To break down content into logical chunks of learning, a new model has emerged for organizing the content-learning objects.

Because we are dealing with an expanded context when we talk about blended eLearning, it is important that we remember that in addition to objects that have been built specifically for learning, other contexts and purposes must also be served. It is possible to do this in separate systems like EPSS and KM systems, but in order to best leverage the three areas, as well as

other functions and uses for the same core content, a single system that handles all of the contexts for content should be considered. The expanding view of this implementation as we use content for learning, performance, knowledge transfer, or other contexts makes it necessary to look beyond the initial functions of an LCMS and consider both the purpose for organizing and managing learning objects, and also the expanded potential for these learning objects beyond the training function.

Reusable Learning Objects (RLOs)

Reusable learning objects hold the promise of making content operate on many different systems and also allowing learning to be managed down to a level of common use. In order for learning objects to meet this promise of reuse, they must be segmented at a granular enough level to be taken out of one context, and reused in another. An example is a course with an introduction to Microsoft Word macros. This same course module might be usable for an individual taking an introduction to Microsoft Excel course who needs to know how to use several Word macros for a cut-and-paste operation between the two programs.

In order for RLOs to achieve their full purpose, it seems that we may have to separate them from their learning context as well. The core material in RLOs can be used for other things besides learning. For example, information on Word Macros from above might also be reformatted into an FAQ in a customer support database (knowledge management system) or a job aid in a context-sensitive electronic performance support system (Help function). For this reason, content objects may be a more appropriate term to use related to reusable objects in a blended eLearning solution. Through effective information mapping, content objects can be tailored to meet learning objectives, performance objectives, or the individual's personal context for the information (such as service call information or a KM people expertise search database).

Standards

A development that should advance the full use of various types of content objects is the growing standards efforts by bodies such as the Aviation Industry Computer-Based Training Committee (AICC), IMS Project (Instructional Management System), the Advanced Distributed Learning Initiative (ADL SCORM), and the Institute for Electrical and Electronics Engineers (IEEE). These organizations are focused on making systems interoperable and also making data/content interoperable. Some of these functions will only be relevant within the context of learning, but others have the potential to extend well beyond training, into other functions of content.

Metadata

One example is metadata, which is useful in defining data about the data being tracked, e.g., a video clip has a title, date created, format information, and other properties. All of these are examples of metadata. As you can see from this example, the information is not necessarily exclusive to a learning function. The same video clip could be used for training, for marketing, in a best practices database, as part of an employee record tracking expertise in a certain area, etc. Here are some common uses for metadata.

Four main uses of metadata point to its inherent value to individuals and organizations. Categorization, Standardization, Reconstitution, and Distribution allow for significant cost and time savings and improved human-computer interaction.

Categorization

First and foremost, metadata can be used to categorize information into a useable taxonomy. For example, the Yahoo categories are a great example of the inherent value of good organization (taxonomy) in easing use and making information accessible. This knowledge management operating principle works best when a consistent metadata model is employed.

Additionally, the application of subjective metadata and descriptors can also be used to perform advanced searches and speed access to and use of key learning objects. Saving time looking for information saves money.

Standardization

Second, reduced cost can be achieved through standardization of the structure of information. Metadata allows content from different systems to be acknowledged and understood. For example, when Microsoft bought PowerPoint and began integrating it with Excel and Word, it was necessary to make content transferable between the applications. In order to be able to cut and paste or save between these file formats, appropriate metadata had to be defined and standardized just for these applications. By doing this at the operating system level, or through open standards, it is possible to significantly reduce or eliminate the integration time and cost for moving data between programs. The same is true within course modules. If all of the information about a course is standardized, it can be integrated into a single catalog or database much more easily. This is the first step in making reconstitution possible.

Reconstitution

Next, often the same information can be reconstituted (or repackaged) into another format. Sometimes this is for a different audience, media format, or possibly delivery device. If a standardized base of content (or knowledge repository) is used to store information that must be presented to web users, mobile users, and for printing, it would be possible to standardize the labeling of the information and determine which content is suitable for a particular audience or format. For example, a compliance document could be broken up by sections. By applying rules to the metadata, an electronic document management system (EDMS) or learning content management system (LCMS) could determine which sections were suitable for

a training session on compliance, which would be most useful to a field operator using a wireless device, and any sections of the document that were meant for onscreen viewing only (animations, etc.) rather than print. Building items once and reconstituting them into units that can be used in various contexts save time and money, particularly in enterprise scale solutions.

Distribution

Finally, to fully leverage the other three uses of metadata, scalability and sharing of content across disparate systems become possible. Once a standard way of categorizing items and reconstituting content into distributable chunks is determined, the courses can be delivered to various audiences beyond the initial scope of the work. For example, significant costs could be saved through sharing standardized content through a consortium or organization like the Masie Center eLearning Consortium or LearnShare, LLC. A current impediment to sharing information across organizational boundaries is the high cost of reformatting, re-categorizing, editing for organization-specific information, and integrating it with proprietary information. An in-house course in business ethics might contain 80 percent non-proprietary content that could be bartered or sold to another organization and combined with its 20 percent proprietary information on business ethics if a suitable metadata schema was in place to track the information, categorize it, standardize it, and deliver it in multiple formats. Distribution and use of content between systems and organizations will be greatly enhanced by standardization of metadata.

These four main uses represent key reasons why the implementation of meta-data standards is going to be a significant advantage for organizations concerned with information management applied to learning, knowledge, performance, and business objectives. Significant cost and time savings are reflected in categorization, standardization, reconstitution, and distribution.

For more information on uses of metadata, see our blended-eLearning web-site and the sites listed below:

http://workflow.ecc-astdinstitute.org/index.cfm?sc=help&screen_name=cert_view

http://www.internetime.com/itimegroup/astd_web/capture.htm

<http://www-cscl95.indiana.edu/cscl95/wiburg.html>

<http://www.imsproject.org/feature/kb/knowledgebits.html>

http://www.learningcircuits.org/dec2000/dec2000_tools.html

http://www.universitybusiness.com/0101/cover_building.html

(Also note Wayne Hodgins's comments on the Learnativity.com home page and stated below.)

Why Standards-Making Organizations

According to Wayne Hodgins, “Whether it is the creation of content libraries, or learning management systems, accredited standards will reduce the risk of making large investments in learning technologies because systems will be able to work together like never before. Accredited standards assure that the investment in time and intellectual capital can move from one system to the next. When companies find their content trapped inside a proprietary format (such as a registration system, a courseware design, or a course sequencing model), the story is the same in each case. It is virtually impossible to reuse, transfer, or have interoperability between these proprietary models. This won't change until we build systems on an open accredited standard.”

A full discussion on standards is beyond the scope of this book, but the following primer should help you learn who is driving the emerging standards efforts and where to get more information.

- **IEEE LTSC** (Institute of Electrical and Electronics Engineers Learning Technology Standards Committee) is currently working on metadata standards for the Learning Object Model (LOM). It has a process for recommending and ratifying standards in a wide variety of technical disciplines—in this case, learning. The mission of the IEEE LTSC working groups is to develop technical standards, recommend practices, and guides for software components, tools, techniques, and design methods that facilitate the development, deployment, maintenance, and interoperation of computer implementations of education and training components and systems. (<http://ltsc.ieee.org>)
- **IMS** (Instructional Management System) is developing and promoting open specifications for facilitating online distributed learning activities such as locating and using educational content, tracking learner progress, reporting learner performance, and exchanging student records between administrative systems. (<http://www.imsproject.org>)
- The **ADL** (Advanced Distance Learning) Initiative owns the SCORM (Shareable Content Object Reuse Model) standard, which is dominating the eLearning industry. The ADL initiative was originally established by the U.S. Department of Defense and is now a collaboration between government, industry, and academia. The purpose of the ADL initiative is to ensure access to high-quality education and training materials that can be tailored to individual learner needs and made available whenever and wherever they are required. This initiative is designed to accelerate large-scale development of dynamic and cost-effective learning software and to stimulate an effective market for these products in order to meet the education and training needs of the military

and the nation's workforce of the future. It will do this through the development of a common technical framework for computer and net-based learning that will foster the creation of re-usable learning content as "instructional objects." (<http://www.adlnet.org>)

- **AICC** (Aviation Industry CBT Committee) develops training guidelines for the aviation industry that have been widely adopted within other industries. The AICC's mission is to provide and promote information, guidelines, and standards that result in the cost-effective implementation of CBT and WBT. (<http://www.aicc.org>)

Industry Examples of LCMS Technology Approaches

In the following sections, we provide excerpts from two industry white papers on LCMS technology: from Avaltus and from WBT Systems. While each vendor is said to provide an LCMS technology for building blended eLearning solutions—and indeed share many common attributes—their approaches and philosophies are quite different. Hence, we have included them here for they demonstrate the breadth of the LCMS marketplace today and better define this technology space. Please consult the book's accompanying web-site for other LCMS products, white papers, and trends that support blended eLearning solutions.

Vendor Approach #1: Learning Content Management and Jupiter™ Technology from Avaltus

(Used by permission, Avaltus, Inc.)

I. The Future of Learning and Knowledge Management

Historically, learning was considered a cost center in most organizations and was most often associated with traditional training courses. The training function was segregated into many independent departments throughout the organization, and classes were conducted infrequently. Today, given the competitive nature of our knowledge-based economy and the accelerated pace of change, eLearning is more often viewed as an integral part of an organization's business strategy. In addition, organizations are now extending their knowledge assets beyond their traditional employee base, sharing them with customers, suppliers, and partners (often referred to as the "extended enterprise"). This requires an organization's learning content to be completely interoperable with other enterprise-wide systems and with the extended enterprise. At the same time, organizations are rapidly adopting the Internet as a platform for communication and cooperation, and this is fundamentally changing the way these organizations operate. This new medium allows businesses to streamline complex business processes, reduce transaction costs, increase process efficiencies, and better serve their customers.

Businesses are seeking web-based systems that can be dynamically updated and integrated, sharing data among web applications and across their entire enterprise in order to present users with a personalized, consistent, and unified customer experience. The knowledge economy requires organizations to be able to rapidly create and deploy learning and knowledge content to a diverse audience with specific business requirements. The key challenge to organizations attempting to capitalize on the full potential of eLearning is

bringing volumes of content online rapidly, efficiently, and cost-effectively, and then keeping that content relevant to their rapidly changing business needs. Most companies have discovered that legacy learning offerings simply cannot meet the needs of rapidly changing business climates nor maximize their investment in eLearning infrastructure. Additionally, companies recognize that much of their legacy content is not compatible with the new delivery systems, and off-the-shelf courseware does not easily support business situations with highly specific requirements or the learning needs of diverse users.

To protect those content assets and upgrade to eLearning, companies must choose between **replacement** and **conversion**. The reality, however, is that development of original eLearning content is often expensive and time consuming, and it is difficult and cost prohibitive to deliver content in multiple output formats. In addition, this content becomes obsolete in a few months or years, forcing companies to repeat the expensive development or conversion process. Companies must find a cost-effective and efficient way to access, manage, maintain, and leverage existing learning assets. A growing number of eLearning companies and software vendors are attempting to address the initial conversion of this legacy content. However, they still use the traditional paradigm for content development, which is linear and discontinuous. The re-purposing process is long and tedious; but more importantly, it results in content that is highly inflexible and technologically limited. Modifications to the content often require the development process to start over, and the existing tools are unable to leverage new opportunities such as dynamic collaboration and knowledge sharing.

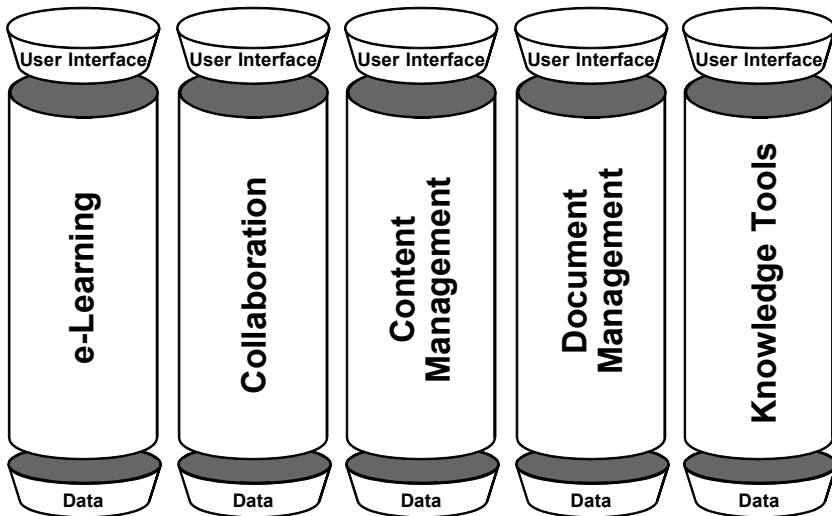
To fully capitalize on the market opportunity, industry leaders agree that eLearning companies must give customers a high-quality solution that can be easily updated, tracked, and measured. They must also allow organizations to (1) leverage the value of their legacy knowledge assets (over 75 percent of knowledge content delivered by large organizations is proprie-

tary in nature, rather than off-the-shelf); (2) integrate with other enterprise-wide systems; (3) support content delivery across multiple platforms; (4) support diverse audiences; and (5) be extensible to exploit future technologies and delivery.

II. Learning Content Management—What Is It?

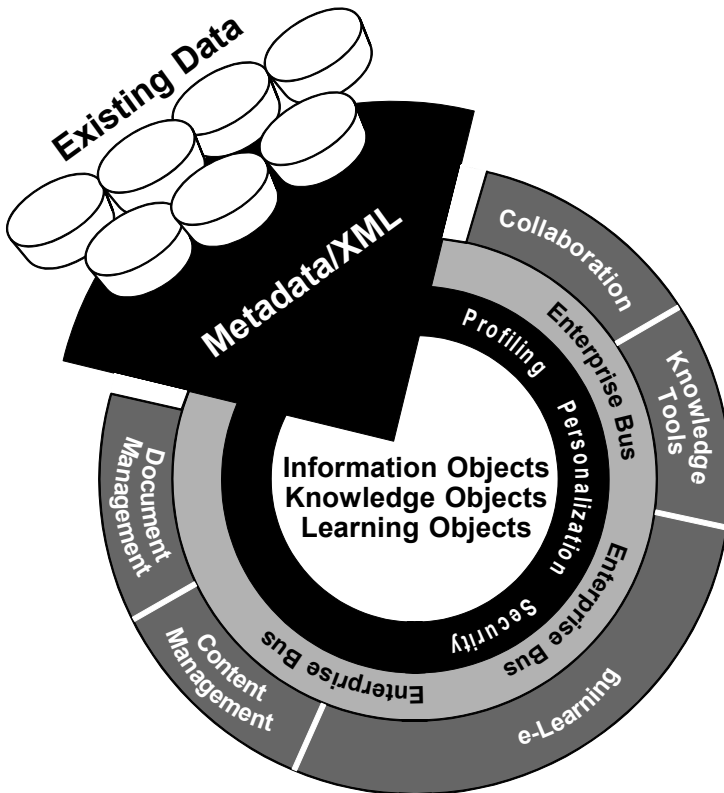
A Learning Content Management System (LCMS) is a new breed of software application to meet the growing information needs of today's knowledge-based economy. The LCMS takes the best-of-breed features and benefits from five major application spaces: knowledge management (KM), content management (CM), document management (DM), online collaboration, and eLearning, which includes technology-based training (TBT), computer-based training (CBT), web-based training (WBT), and learning management systems (LMS). Currently these applications are operated as stand-alone solutions within the organization as highlighted in Figure 9-1.

Figure 9-1. Knowledge Solutions in Today's Market



In contrast, the LCMS unifies the user interfaces and data repositories (see Figure 9-2), enabling an enterprise to turn the massive amount of information stagnating on corporate networks throughout the enterprise into interactive, stimulating, online learning. An LCMS uses a corporation's existing data as the source for the training experience, instead of relying on outside curriculum development, which is dependent on the work of a few subject matter experts (SMEs).

Figure 9-2. Future Knowledge Solution Architecture



The following describes the integration of these elements:

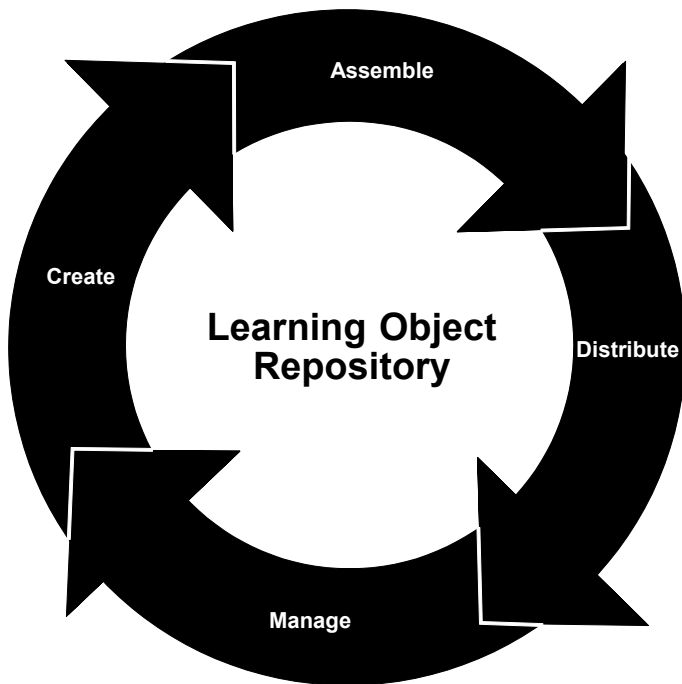
- **eLearning**—An LCMS (in contrast to Internet content management tools from Vignette, Interwoven, and others) encompasses all of the aspects of a TBT system. Interactive exercises, tests and assessments, presentation items, multimedia, and simulations are all part of the LCMS offering. LCMS systems are different from CBT and WBT systems because they separate the content from the delivery technology, the different instructional strategy themes, and the look-and-feel themes. XML and open data sharing make this pure-content model possible. No longer is content locked up in “here today, gone tomorrow” presentation technologies like Authoring Tools, Flash, Legacy CD-ROMs, PowerPoint, and even HTML. Content is free from these boundaries, which allows a single piece of knowledge to be shared, reused, and recombined with other knowledge in new instructional activities.
- **Collaboration**—Online collaboration tools have struggled to define themselves among other applications on the enterprise. An LCMS system brings these applications home, where they make the most sense: that is, as part of an enterprise-wide system that gathers corporate knowledge, stores it, and deploys it back to the corporation just in time.
- **Content, Document, and Knowledge Management**—An LCMS encompasses the workgroup collaboration and data aggregation function of knowledge management (KM) systems and the flexibility of document management (DM) and content management (CM) systems. However, it also adds a key ingredient that is missing from those systems: instructional strategies. KM systems have had a slow adoption rate because

they merely present the information in the exact form in which the system found it. In this mode, a KM system is no better than a web search engine or even a file system search tool. The same is true of applying CM systems to learning. An LCMS adds value to the aggregated content by providing automatic instructional strategies like practice/feedback/remediation loops and discovery exercises. Instead of the data-in, data-out functionality of a typical KM system, an LCMS gives the corporation the ability to transform data into interactive learning.

- **Learning Management Systems**—The learning management system (LMS) applications have found a home on the enterprise by compiling data that the system collects from all aspects of the corporate training experience, often for ROI measurement. However, the LMS market is struggling with the need to get more and more in-depth information about the training experience. While a typical LMS can measure who took what training when, they cannot delve into which individual pieces of the training are successful and which are not. Standards are starting to be developed to provide LMS systems with this crucial item analysis and curriculum metadata. But the adoption process among the CBT/WBT vendors is slow, and the standards movements are even slower. An LCMS solves this problem by encompassing the measurement capability of an LMS and taking it to the lowest level possible: an individual learning object. Statistical studies for ROI purposes are still possible. And the LCMS adds a new, vital statistical function: learner and content profiling. The LCMS can use its detailed data on learner scores, question choices, and navigation habits to give content managers crucial information on the effectiveness of the content when combined with specific instructional strategies, delivery

technologies, and learner preferences. The profiling functionality must work in partnership with adaptive instructional strategies to give a learner the most information in the shortest time possible.

This architecture also provides for the ability to adapt to different delivery methods. All CBT and WBT technologies are just what their names imply: computer based or web based. An LCMS system rises above these specific platforms to become an enterprise-based application. Content in an LCMS can be added, managed, and delivered to many enterprise technologies including stand-alone computers and web servers. This distinction allows LCMS systems to adapt to whatever new technologies are adopted by corporations in the future, which may or may not be based on today's web technology. It adds the ability for the same training content to be delivered to many different technology platforms including the Internet, the corporate LAN, stand-alone computers, printed materials, and wireless devices. Original courseware can be rapidly customized and modified with this architecture. Instead of a linear process, the management of content becomes an ongoing process that allows companies to update the training as their business changes. This content management process is depicted in Figure 9-3. Key distinguishing features of an LCMS are highlighted in the next section.

Figure 9-3. Content Management Process

III. Learning Content Management Feature Set

A viable business strategy requires an underlying learning content management system (LCMS) with an infrastructure that can be used to rapidly create, modify, and manage content for a wide range of learning for rapidly changing business requirements. All contributors to the “content supply chain,” including collaborative teams, must be able to develop content in parallel. Training professionals, development teams, and knowledge experts in specific knowledge domains are all critical to an organization’s success. However, they often operate in islands, isolated from each other and unable to communicate effectively, and often struggle to push content through a development process that is over-committed, disparate, and inefficient—resulting in wasted time and productivity.

Trends indicate that the need for a solution to support the conversion, development, and management of large amounts of content and workflow issues will continue to increase, as the amount of eLearning content demanded increases and the complexity continues to grow in the modern company's eLearning adoption. Estimates show that this exponential growth in complexity will accelerate. This will make it vital for companies to employ content management and workflow systems to encompass the efficient/effective creation and management of their knowledge content and learning. Learning content management systems have distinct features. While learning management systems (LMSs) focus primarily on human capital management and processes related to learning management, skills, and transactions in corporate training, an LCMS enables the creation, management, and deployment of large quantities of content for learning and performance support. Learning content management is the process of coordinating and managing the flow of information and knowledge related to learning content development. Learning Content Management includes:

- Content creation tools, application interfaces to third-party content creation tools, and templates that separate content from layout and allow content to be deployed in different formats;
- Capabilities for meta-tagging content to support cataloging, intelligent retrieval, dynamic personalization, and ongoing maintenance and management of content in a repository;
- Management of the life cycle: work-group development and collaboration, process automation of content development, testing, versioning, and rollback;
- Live and staged delivery of content to eLearning application platforms, print, and CD-ROM; and

- Open architecture to link to multiple disparate content creation and delivery activities and systems spanning various organizations.

True reusability of learning requires a data format that separates itself from its presentation and delivery. Designed information must be able to be incorporated on the fly with multiple applications. A key aspect of reusability is the ability to deliver content in multiple formats without having to change the content. Application functionality should be independent of the content while allowing content to be combined with other content that can be presented with a consistent look and feel, continuity in flow, and experience. Today's solutions make true reusability impossible. Chunking web content and wrapping XML metadata around those chunks provide a false sense of shareability and reusability. Content today is still held hostage by the tools used in its development and at best only allows for the sequencing of disparate parts of static learning activities. Following is a list of key feature sets and functionality:

Creation Assembly/Integration Platform & Systems

- Storyboarding
- Integration/Support w/ Third Party Tools:
 - Authoring Tools
 - Publishing Tools
 - Media Creation Tools
 - Knowledge Capture

Tools

- Metadata Capture
- Intuitive Interface
- Distributed Authoring
- XML Import & Export
- Content Aggregation
- Extensible Metadata Framework
- Robust Templates

- XML Templating
- Instructional Templates
- Assessment Templates
- Simulation Templates
- Extensible Templates out of the box
- Testing and Instant View
- Curriculum Views
- Process Automation
- Personalization
- Multi-channel Delivery (print, web, CD-ROM, WAP, etc.)
- Open API for Extending or Customizing Engines
- User Profiling
- Live and/or Staged Delivery
- Catalog Integration
- Production and Learner Side Reporting
- Metadata Storage
- Categorization & Cataloging
- Security—Role-based authentication
- Configuration Management
- Version Control
- Digital Rights Management
- Administration
- Search and Retrieval by Metadata
- Archiving
- Work-Flow Management—Check-in, Check-out, and Approval
- Reusability
- Scalability
- Enterprise Class Services and Enterprise Applications
- Interoperability through Computer Industry Standards
- Learning Standards
- Technology Standards
- Component Extensibility
- Database Support
- Operating Systems

Questions to ask to differentiate a true LCMS:

Creation

- Can the application import and export content from third-party applications, databases, and content repositories?
- Does the content management system allow customers to develop content for the LCMS without having to purchase special tools or software from the LCMS vendor?
- Are you able to use your LCMS without a third-party authoring tool and still enable rich content creation?

Assembly/Integration

- Does the application suite include a content management tool for the simultaneous editing and creation of content for hundreds and even thousands of concurrent users?
- Is this tool a true multi-user client-server application, or just a web server-based application that manages multiple users but not multiple simultaneous users?
- Can the LCMS add value to existing content without editing every piece of that content? For example, can the instructional strategy or navigation paradigm be changed or updated without touching the content?
- Can the content be branded for look and feel and navigation control at the sub-document level?
- Can the LCMS gather content from two or more sources and combine it into a single learning experience without a change in the navigation or look and feel of the content from the learner's point of view?
- Can the system extend new templates without recompiling the LCMS or restructuring the database schema?

Deployment

- Does the LCMS have in place today an API and a strategy to ensure the content aggregated in the system today can be delivered to any technology in the future?
- Is this strategy a multifaceted one for maximum possibility of success? Or is it betting on the ubiquity of one specific technology like a web server or a Java Virtual Machine?
- Can you deploy to non-web environments and provide full functionality?
- Can you stage- or live-deploy content?
- Can the LCMS dynamically change content delivery based on user profile (including preferences like bandwidth, learner style, and learning situation)?
- Can content be dynamically altered based on prescriptive models?

Management

- Does the LCMS provide groupware features required for workflow management including check-in/check-out, user roles, security, and support for disconnected users?
- Does the LCMS provide production side reporting and end-user learning activity reporting?
- Does the LCMS support digital rights management?
- Does the LCMS support extendable metadata?
- Is the content and metadata fully searchable?

Architecture, Platform, and Systems

- Does the application store all content in pure XML, not just merely use XML to attach metadata to large blobs of content?
- The LCMS of today must deploy content to new platforms tomorrow. If the application doesn't have a firm foundation that completely frees the content from the delivery channels available today, you cannot expect

it to put today's content into yet undiscovered delivery channels coming in the next few years. Does the application lose any significant functionality in all but one of the stated delivery channels (a sure sign of "porting" as opposed to platform independence)? For example, does the application offer rich functionality for today's web browsers but a loss in functionality for stand-alone/CD-Rom delivery or print delivery?

- Every enterprise application sold to the Global 1000 is built on industrial strength, computer industry standard technologies. Is the application built on an enterprise-level, scalable technology (J2EE, MS.NET, COM/CORBA)? Or when the subject of scalability comes up, does the LCMS vendor start talking about database vendors, expecting the database to do all the work?
- Is your application using an Enterprise Named Services Architecture that makes component services and individual objects usable and extendable with other enterprise technologies?

IV. Jupiter Learning Content Management System

The Jupiter Learning Content Management System from Avaltus, Inc., provides a unique solution for organizations to manage the life cycle of knowledge content for their prospects, customers, partners, sales force, and employees. Jupiter is a Learning Content Management System (LCMS) that provides a complete solution to rapidly collect, organize, design, publish, and manage on an ongoing basis. Jupiter enables organizations to re-purpose knowledge content of the following types:

- Multimedia information presentation
- Interactive knowledge discovery
- Learning experiences
- Assessment and certification
- In-context information and support
- Query and response

A key strategic feature of Jupiter derives from the fact that all content, including media elements, scripts, course structure, learning activity templates, instructional strategy and navigation, course logic, look-and-feel, and delivery mode (CD-ROM, web, etc.), is stored completely separate from and independent of the code that delivers it. The resulting benefit is that all this content can be “ported” readily, using the emerging content language of the web—XML—both into and out of the Jupiter system. Once in Jupiter, the content is able to derive all the features and benefits of the technology, such as delivery to both CD-ROM/LAN and the web (Internet, extranet, intranet), re-use of content and structures in new courses or across industries, and the re-publishing of course content using alternate course structure, instructional strategies, navigation, and look and feel. Every element that is stored in the Jupiter repository is a content object and can be combined, and meta-linked to create an infinite array of learning opportunities. Parent objects can be pointed to their children by reference, and child objects are capable of being reused by multiple parents and other child objects.

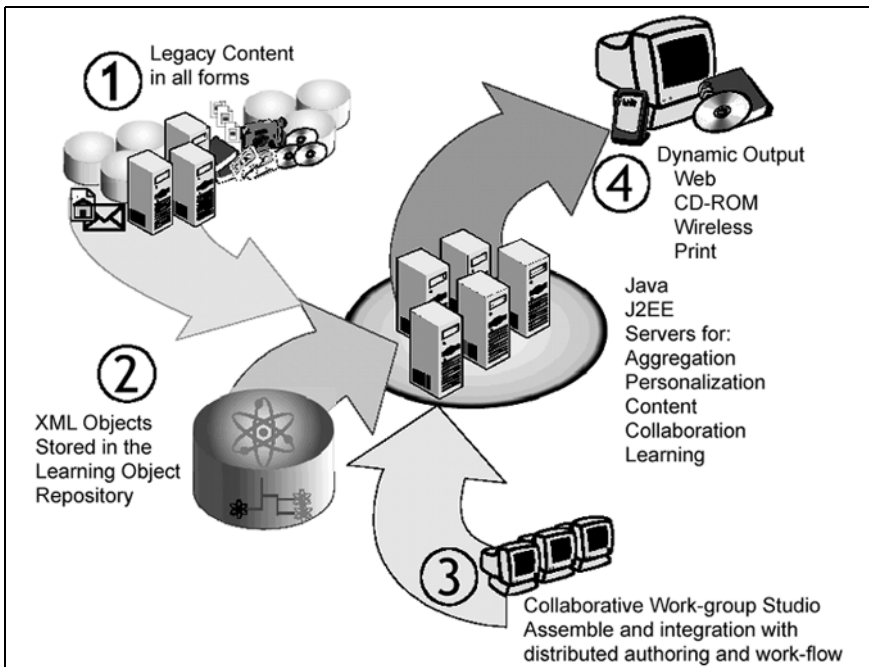
The diagram in Figure 4 illustrates the component nature of Jupiter, displaying the various levels of the Jupiter environment and providing examples of the types of elements at each level. **Content Authoring** offers tools for course creators, updaters, customizers, and re-purposers to manipulate the Jupiter database rapidly and powerfully. **Raw Content** consists of the scripts and media entered into Jupiter’s object-oriented database. **Learning Activity Templates** are the coherent bundles of interactivity that fulfill specific learning objectives within a course. **Instructional Strategy and Navigation** schemes provide rules for navigating a course, types of feedback logic, and evaluative logic. **Look-and-Feel Themes** provide different interface arrangements and specific graphics for standard interface elements such as background, windows, navigation bar, buttons, etc. Finally, **Technology of Delivery**

provides alternative “viewers,” such as CD-ROM or web server, by which to publish learning content.

The Jupiter Architecture

The Jupiter LCMS is an enterprise-level application created to meet the needs of businesses taking content management, eLearning, and online collaboration to a new frontier. The enterprise application suite is composed of many scalable parts working together to seamlessly provide content management services, groupware collaboration, ongoing corporate knowledge collection, and dissemination in real time. Figure 9-4 illustrates the Jupiter LCMS solution.

Figure 9-4. The Jupiter Solution



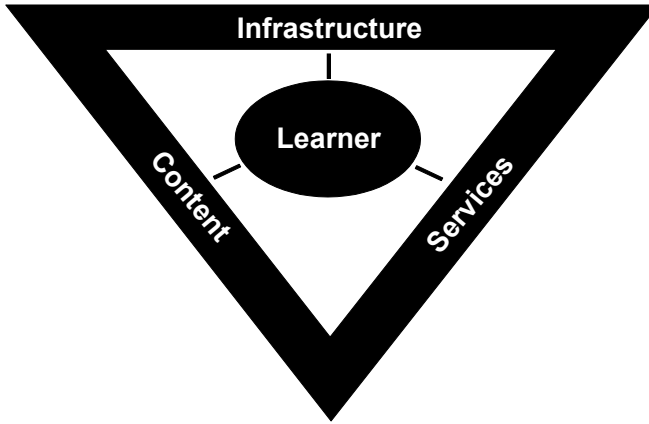
Jupiter provides an integrated system that supports the constant creation, assembly/integration, deployment, and management of learning content throughout its lifecycle—(1) Content is aggregated from across the enterprise and converted into XML format; (2) Data, scripts, and media elements are then deposited into an Object Repository; (3) Developers and knowledge experts then assemble a variety of knowledge and learning content in a collaborative work group fashion; and (4) Knowledge objects and learning content are then deployed in a way to support multiple delivery and presentation formats. This process is continuous and allows for content to be pushed or pulled to and from a variety of enterprise services.

Vendor Approach #2: TopClass Suite—A Complete eLearning Content Solution from WBT Systems*

Learning is one of the most complex of all processes within an organization. Not only has it historically been a very fragmented process with little use made of technology, but the learning and in particular how people learn effectively varies significantly from individual to individual. It is no wonder then that much confusion still exists in this nascent industry on what a complete eLearning solution looks like.

At its highest level, it is useful to think of a complete eLearning solution as comprising three core components, with the organization and learner at the heart. As illustrated in the figure on the following page, these three are infrastructure, services, and content.

*(Used by permission, WBT Systems)



Infrastructure

Often referred to as the “plumbing” of an eLearning solution, the infrastructure refers to the application-level software that allows all aspects of learning, from classroom to web, to be created, managed, delivered, and measured. This category is further subdivided into products such as learning management systems (LMS) and learning content management systems (LCMS) as will be discussed later.

Services

Successful implementations of eLearning technology require, as in the case of all enterprise-class applications, appropriate planning, customization, integration, and application management. Any or all of these services can be sourced in-house within an organization or, as is more common, by leveraging the experience and scale of outside consulting organizations. Additionally, and somewhat unique to eLearning, is a class of services associated with the learning process itself such as mentoring or facilitation services provided by subject matter experts (SME) in a third-party organization.

Content

Within an organization, content requirements will vary in terms of subject matter, preferred format (text, video, simulations), and language to name just three. Where possible it is typically desirable to purchase preexisting content from third-party vendors such as in common generic areas like IT applications. However, the vast majority of content will be industry- or organization-specific and will have to be captured and created in-house or through the use of local custom content creation houses.

Infrastructure Components

eLearning infrastructure, like all e-business technologies, builds on classic networking and enterprise infrastructure services and standards such as IP-based networks, web browsers, and database and industry standards such as Oracle, SQL Server, Microsoft Windows, and Sun Solaris.

At the application layer, there are three primary sets of technologies that can be integrated to provide an infrastructure framework for delivering the complete suite of eLearning services. These components are the learning management system (LMS), the eLearning content management system (LCMS), and the virtual classroom (VC).

Learning Management System

LMS software products include a database of student records with administration and delivery interfaces for learning. LMS products typically provide functionality such as:

- Competency and skills management
- Skills gap analysis
- Resource management
- Inter-connectivity with VC, LCMS, and enterprise applications

eLearning Content Management System

LCMS software products are primarily responsible for creating, managing, maintaining, delivering, and tracking web-based content and provide functionality such as:

- Content migration and management
- Learning object repository
- Content reuse and adaptive individualized learning paths based on Learning objects
- Asynchronous collaborative learning via mail and discussion groups
- Testing and certification
- Inter-connectivity with VC, LMS, and enterprise applications

Virtual Classroom

Virtual classroom technology is designed to support synchronous collaboration by allowing a live classroom experience to be conducted over the Web. It includes functionality such as:

- Voice over IP (VoIP)
- Video conferencing
- Shared whiteboards, application screen sharing, and live feedback
- Archiving of classes as learning objects
- Inter-connectivity with LMS and LCMS

Recently, as eLearning has begun to come of age, Global 2000 and other organizations have begun to leverage the use of e-business technologies for enhancing the running of their learning and training programs. This led to the emergence of the learning management system category as an infrastructure solution. LMS solutions are focused primarily on cost displacement by administering existing classroom training through the web, focusing on elements such as catalog and registration, resource management, and back-office financials. LCMS solutions, however, are a class of software products that

include a learning object repository with authoring and delivery interfaces for eLearning and knowledge management, and are designed to support the rapid capture, delivery, and measurement of knowledge in a web-based fashion. eLearning Content Management Systems like TopClass from WBT Systems are focused on achieving “personalized learning on demand” to drive performance in an organization by delivering content to learners to solve business problems.

The concept of personalized learning on demand evolved from ten years of research carried out by the founders of WBT Systems as part of a consortium of higher education and private industry focusing on distributed learning technologies. These core principles, which are the foundation of the TopClass LCMS, are:

- **People learn in small chunks**
An extreme example, a four-year degree course comprises many thousands of smaller discrete learning events. Recognizing this is key to promoting speed of delivery, maintenance, and effectiveness of eLearning. Support for learning in small chunks is typically provided through a learning object–based management system.
- **People learn by collaborating**
For 6,000 years of human civilization, we have learned in groups. From the first village storytellers to the latest MBA seminar, the collaboration that takes place among learners and mentors promotes better understanding and contextualization of learning. Embracing the power of collaboration through asynchronous tools, like discussion groups, and synchronous tools, like live classes over the web, not only enables more effective learning and promotes motivation, but these collaboration objects themselves can be captured and become learning objects for the next set of learners.

- **Support the rapid capture and turnaround of knowledge**

The lifetime of knowledge is shortening all the time, so clearly the ability to rapidly capture that knowledge and make it available to those that need it in a timely fashion is key.

- **Learning should be tailored to the needs of individual learners**

Most of us by now have experienced purchasing a book from Amazon or using My Yahoo!. This has created an expectation that web technologies should be capable of adapting themselves to our own preferences. This should certainly be true for learning, which is perhaps one of the most subjective and personal areas of our lives.

- **Support organizational business rules**

Clearly we must be able to support the economic and business imperatives that drive our business, which includes everything from formal legal training requirements such as OSHA or other regulatory compliance, to more informal business requirements, such as product knowledge or organizational value systems.

- **Most fundamentally, learners control what, when, where, and how**

eLearning gives us an unprecedented opportunity to empower our employees, partners, and customers to control (within the bounds of the previous point) what they learn, how they learn it, when they learn it, and where. Nothing drives success for an organization more than a smart and well-educated workforce empowered to do their jobs more effectively.

Speeding Time to Performance

Personalized learning on demand is all about reducing the time to performance. You can think of time to performance as the period of time that elapses from the initial creation of the knowledge or learning (which is often not done in an electronic form) to the ultimate ability to apply that knowledge in a practical situation by a learner. This means moving beyond proficiency to performance—the ability to apply the new knowledge or learning in a new context. It encompasses the entire learning lifecycle from authoring or creation to delivery and mentoring and finally to application of that knowledge.

The more an organization can minimize the time to performance throughout its supply chain (encompassing employees, contractors, partners, vendors, and customers), the more it will impact on the top line of that organization.

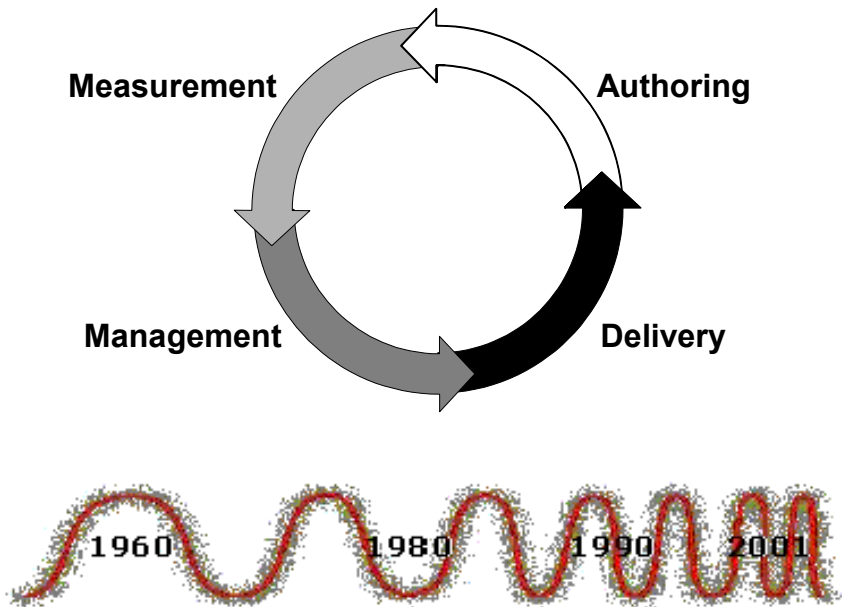
For example, the faster and more thoroughly a high tech product company can get their own sales people trained on the introduction of a new product, the sooner the product can be effectively brought to market and generate revenues. An eLearning Content Management System allows an organization to:

- **Compress the learning lifecycle**

While we cannot eliminate any of the fundamental steps required to capture and deliver knowledge (as shown in the figure below), we can compress the time taken within each step.

- **Authoring**

By providing tools that support the rapid migration of legacy content such as PowerPoint and Word files, this allows an organization to leverage the knowledge assets it already has invested in developing. Putting these authoring tools directly into the hands of the subject matter experts (SMEs), without requiring them to learn proprietary new tools, leverages their expertise.



- **Delivery**
Providing just-in-time, just-enough delivery over the web, in both an online and offline format, permits the rapid dissemination of knowledge and access to the learning object library at any time.
- **Management**
Providing tools to support all management aspects of creating, delivering, and tracking web-based learning enables management of large numbers of user and learning objects across dispersed, multilingual environments.
- **Measurement**
Providing testing and certification enables regulatory adherence and other forms of compliance as well as return on investment analysis and reporting.

Promote Content Reuse

An eLearning content management system and in particular its learning object foundation provides an opportunity to think differently about how eLearning is leveraged and to promote content reuse in a number of ways:

- **Share Learning Objects across courses**

Migrating content into Learning Object form allows us to reuse significant chunks of contents across groups of learners. The result is money saved while more relevant content is delivered faster to each group.

Take for example a course on the introduction of a new release of a software product. Typically significant elements of this course will be the same as in the previous version. In the old monolithic course structure, it would be necessary to start again and develop the entire new course from the ground up or at best go through the laborious process of breaking down the old course to extract the salvageable elements. With an LCMS and a learning object architecture, the old course and the new course can both be delivered from the same exact set of learning objects, tailored for each version of the software. In this way you leverage, for example, the 80 percent of the content that is common and supplement that by weaving in the 20 percent that is different for each course or group of learners.

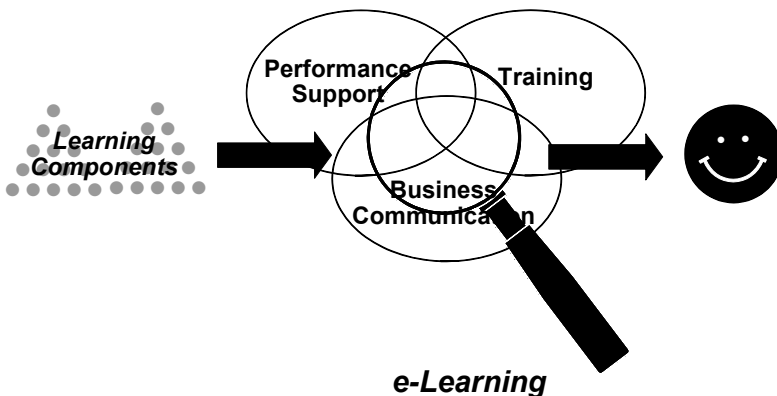
- **Reuse content in different ways**

Once content is managed as learning objects in a single library, that content can be reused across what have been traditionally thought of as very separate delivery scenarios (see the figure below)—from very formal training events (such as a typical eight-hour online self-paced class—1,000 learning objects) to less formal performance support scenarios (such as a 30-minute job aid—10 learning objects) to very informal business

communication (such as a single question and answer—1 learning object). The leverage comes from learners having access to the learning object library and the fact that in essence the Q&A is potentially a subset of the performance support content that is a subset of the formal self-paced class content. Each course is a subset of the prior course's content.

- **Lower maintenance costs**

The initial creation and delivery of the course is only the beginning of the reduction in time and costs associated with the learning process. As the courses evolve over time, they can be reused as described in the previous example. Additionally, only one copy of each individual learning object exists, so as the master copy is updated, this change is automatically reflected for every course that is referencing it anywhere on the system. This allows maintenance costs, which are often hidden and unforeseen, to be dramatically reduced.



Learning Objects Definition

Fundamental to personalized learning on demand and content reuse is a learning objects architecture. At its simplest level, learning objects are reusable building blocks of learning.

To understand the concept of learning objects, think of training material not in terms of “monolithic courses,” but rather as being constructed of a set of smaller components or “chunks” of learning. Learning objects are building blocks of learning. This is a little bit like building a house. Two different houses may contain many of the same common elements such as the type and number of doors or windows, but everyone doesn't want the exact same house. Monolithic courses assume everyone has the exact same needs, whereas the learning objects approach recognizes that it is important to be able to tailor each house based on individual needs.

Learning Object Granularity

Some definitions of learning objects attempt to quantify how big or small a given learning object should be. Typically this is done in the form of a metric such as “it should take no more than 30 seconds to review” or “it should contain no more than three individual screens of information.” WBTIs implementation of learning objects does not enforce a requirement on Learning Object size because the appropriate definition of size depends on many factors such as subject being covered, instructional design philosophy applied, and media tools being applied (video versus text only, for example). Given an enterprise-wide deployment of a learning objects library, it is inappropriate to dictate issues that are clearly the purview of the customer and will vary on a case-by-case, person-by-person basis, even within the same enterprise.

Key Benefits of Learning Objects

The ability to locate and access learning material in the form of components or chunks that are smaller than entire courses is central to delivering on the promise of personalized learning on demand. Monolithic courses allow for very limited personalization. Some limited personalization can be achieved through basic pre-assessment, but this is typically “hard-coded” into the

course by the vendor, is severely limited, and cannot be enhanced or replaced.

Constructing courses in this manner allows learning objects to be reused across many different courses and allows courses to be updated and revised without requiring major changes. These benefits promote cost savings both in developing content (because it can be reused in more ways) and maintenance (because you only have to change one learning object to update all courses that use it).

Characteristics of TopClass Learning Objects

WBT pioneered the learning object concept in real world implementations, and as you might expect, our offering provides deeper functionality and is more mature and proven in its approach. TopClass learning objects (TLOs) have the following key characteristics:

- **Default sequencing**

They are structured (“ordered” or “sequenced”) into a hierarchy, much like the table of contents of a book structures it in terms of chapters, sections, and pages.

Benefit: This means that it is not necessary to select each individual learning object you want to have when constructing a course. You can simply choose to use the default structure because when you select a TLO, you automatically get every TLO it contains in the default order.

- **Separation of sequencing from content**

The sequence or ordering of the TLOs is managed separately from the content of the TLOs themselves.

Benefit: This means that either an instructor, or more usually the TopClass testing engine, can insert or remove additional TLOs from anywhere in the TLO library into the learning path for an individual or group of learners and that TLOs can be used in many different

courses in different ways. The navigation or sequencing for each individual learner or group is automatically managed by TopClass and only one copy of each learning object exists.

- **Independent of granularity**

There is no restriction on how “big” or “small” a TLO should be (i.e., no restriction on how much information or content is contained within a TLO). **Benefit:** This means that an author is free to determine the combination of instructional design, visual style, and other aspects of granularity that makes sense for a given topic without having restrictions imposed on them by the system. Additionally, this provides a migration strategy for content that has not yet been broken down into learning object format because an entire monolithic course can be constructed as one learning object.

- **Content agnostic**

They provide the ability to incorporate any content regardless of the vendor or tool that created the content with complete control over content look and feel.

Benefit: Provides a vendor agnostic and tools agnostic enterprise-wide learning object library. This provides the ability to incorporate the full spectrum of content types from plain text documents to Flash to very rich audio/video and simulations and puts the choice and control in the hands of the customer/author. It also allows content creators to continue to use any of the tools they are using today (from PowerPoint and Word at the high volume end to Dreamweaver and FrontPage at the midrange to high end tools such as ToolBook, Authorware, and Flash).

- **Categorization**
They provide the ability to not only order the learning objects into hierarchies, representing levels of categorization like the Dewey Decimal system used in libraries, but also to “tag” each individual learning object or group of learning objects with metadata (data about the learning object) based on proprietary rules or using emerging industry standards such as IEEE or IMS.
- **Security**
The ability to set security rights at the individual object level to control what types, groups, and individual users have access to view, edit, and assign content.

What is the Difference Between a TLO and a Media Asset?

TLOs (folders, pages, and tests) typically contain smaller components in the form of media assets. Media assets are any piece of content or object referenced in the TLO. This includes any Java, JavaScript, audio, video, images, or other media type that may be used by that learning object. In this context, you may think of the TLO as consisting of three parts:

- The “shell” or container structure including the name of the TLO
- The “core content” in the form of the HTML or XML
- The media assets referenced in the core content

When you perform an operation in TopClass on a TLO such as retrieving, assigning, or exporting, it usually involves all three components.

What Types of Content Can be Delivered as TLOs?

Any type of content that can be delivered over the web may be delivered and managed as learning objects in TopClass. This includes all of the common web formats such as Flash, Real,

QuickTime, Acrobat (PDF), Windows Media Format, all graphic formats (such as GIF, JPEG, and PNG), as well as of course all flavors of HTML and XML (including DHTML and CSS). Additionally, TopClass Publisher includes the ability to automatically convert common legacy formats such as Word and PowerPoint into both a web-deployable and Learning Objects format simply by dragging them into TopClass Publisher.

Conclusion

Convergence of various contexts for content will produce enterprise-wide repositories or digital content warehouses that can be used for many purposes, some of which affect learning, performance, or knowledge transfer. In addition to systems that are used specifically for eLearning (LCMSs), EPSS, or knowledge management, it is possible to link to systems that operate at the next level of organizational need—enterprise-level digital asset management. This type of system addresses the higher order need of creating, tracking, and distributing important corporate assets and making them available throughout an organization.

The [blended-eLearning.com](http://www.blended-elearning.com) web-site (<http://www.blended-elearning.com>) has more information on specific systems in the LCMS category.

Chapter 10

Media, Collaboration, and Synchronous Tools

In order to capitalize on the promise of blended eLearning, a number of humanizing techniques can be implemented in addition to pure technology solutions. Examples of areas that can augment the overall richness of interaction and the overall learning experience in a blended solution include rich media, synchronous (real time) delivery, and collaboration. Rich media—audio, video, animation, etc.—can help engage learners in both self-directed asynchronous eLearning and in live classroom settings as a digital surround and through synchronous online instruction. Combining audio and video along with other advanced media can be quite effective.

Rich Media

The web is the newest medium for training delivery, but the older mediums of audio and video can be used as effective tools to convey meaningful training content over the web. The Internet, and more specifically the web, can be used to communicate in a number of ways. Audio and video can be components of a real-time or just-in-time system and can be delivered one-way, or as a multidirectional communication medium. The focus of this chapter is the use of video and audio for delivery of just-in-time training materials over the web. Two basic techniques—downloadable and streaming—are used to deliver audio and video content. Downloadable audio and video files must be sent to the receiving computer (client) in their entirety before they can be processed, stored, or presented to the user. On the other hand, streaming formats allow the audio or video content to be

played as it is downloaded to the client with just a short delay at the beginning of the file load to buffer enough of the content to keep delays from occurring often. Both techniques will be examined in relation to WBT delivery.

Typically, audio and video are just two components that can make up a web-based training solution. It is important to understand when their use is appropriate and to recognize the potential problems and solutions associated with web delivery. In this chapter you will discover how to plan and implement effective audio/visual training content over the web. After reviewing best practices and several sites that use audio and video as part of a training solution, you'll also review some of the latest technologies and future trends.

Many studies tout the effectiveness of multimedia on retention and understanding of information. Web-based training courses can benefit from improved retention and attention. Studies have shown that you retain 10 percent of what you read, 20 percent of what you hear, 30 percent of what you see, and 50 percent of what you see and hear. Additionally, a study by Lee and Bowers (1997) shows that hearing spoken text and looking at graphics produced 91 percent more learning over the control group who did not study the same topic between standard pre- and post-tests. The benefits of audio and video used for learning can be extrapolated from these studies. Based on these statistics, it is understandable that so many organizations are exploring the addition of audio and video content to their web-delivered courses.

The key benefits of audio/video (A/V) go back to some of the fundamentals of cognitive learning theory. A few examples follow. Multisensory learning has the added benefit of engaging the learner in addition to greater retention. Audio and video can often convey feelings and the subtle contexts of learning more effectively than other tools. Video is particularly effective when trying to demonstrate a kinetic task such as a tennis serve or proper turning procedure for a bolt assembly. Another use of A/V

on the web could be for personification. Audio and video can be used to restore the human element to technology-based training. For effective use, consider how A/V media can help you meet learning objectives and accommodate particular learning styles.

Another benefit will be obvious to anyone with a large library of existing training content. The use of audio and video over the web may allow you to capitalize on the reuse of existing A/V resources. While simply throwing existing video or audio training onto the web will most likely prove ineffective, these resources can be valuable components in a well-designed web curriculum. Each morsel of video and audio content forms a learning object that can be combined with other objects like interactive exercises, written course curriculum, graphics, and tests to form an effective solution for delivery of web-based training.

With all of these benefits, why is there so little A/V media used in WBT? There are a number of considerations that must be addressed. First, there are equipment and logistical considerations. Even with the compression techniques available today to make audio and video as small as possible (while still maintaining sound and image quality), network resources are often strained by the use of audio and video. In order to use audio and video, additional network, computing, and software requirements over typical WBT are required. Networks must provide enough available bandwidth to accommodate the increased volume of packets carrying large audio and video files. Computers must be able to process video and audio content while running the operating system, network services, and a web browser at the same time. This increased computer resource requirement is sometimes furthered by the requirement of a plug-in or helper application to run specialized audio and video functions. The network, computer, and software resource cost must be considered when planning the use of A/V materials in a web-delivered curriculum.

Another factor to consider when building training materials is the additional cost and time required to develop WBT with video or audio content. While new tools are making the integration of A/V resources easier, it is still more expensive and time consuming to develop than WBT without multimedia content. A/V development can require video and audio production techniques unfamiliar to many trainers, specialized production tools and facilities, and expert knowledge of which delivery methods to use on the web. As development and delivery tools become more advanced, these problems will become less of a concern, and web-delivered A/V content will proliferate.

The following sections of this chapter will discuss ways to capitalize on the benefits of A/V content and to minimize common problems in development and delivery of audio and video for the web. You will also learn some of the best practices and potential uses of A/V resources to promote effective learning.

Techniques

When to Use Audio and Video

Margaret Driscoll comments on the trend to overuse multimedia in web-based training. She believes the focus is too heavily on media and production and not on instructional design. It is important to use multimedia appropriately to meet learning objectives. What are appropriate uses, and when should audio and video be used? Here are a few examples:

Introduction of a Topic

Audio and video often serve as engaging opening elements to a new concept or section of instruction. The appeal to multisensory learning can promote greater initial understanding and the motivation to explore the topic in greater detail. This technique works well in information design models that follow the newspaper-style inverted pyramid or the opening action of a dramatic model that follows theatrical methods for conveying instruction.

Kinetic Demonstrations

Video is an excellent choice for instructing people in activities that involve motion. One of the few ways to show kinetic motion on the web is the use of video. It is important to remember that you will typically have a very small image size compared to full-frame video. This is especially true if you are attempting to send video over a standard dial-up connection. This smaller image can make detailed actions difficult to see without using techniques specific to web requirements when shooting the footage. For starters, you may need to zoom in tighter on the subject or crop the digital video before placing it on the web. Realistic looking scenes with action are best suited to web-delivered video as long as the focal point of the scene does not require viewing small details that may not be visible at low resolution. Distracting backgrounds should be avoided.

Multisensory Experiences

Seeing and hearing in synchronicity can promote better retention and understanding. Video and audio used in conjunction can present a powerful message. This is especially true if the subject matter of the training involves both visual and aural material. As a basic example, a narrator describing an assembly process as it is shown being put together is more effective than either the narrative voice description of the process or the visuals of the process if they were presented independently. Capturing the sights and sounds of an environment is a worthy objective in the delivery of WBT.

The Power of Audio

Few people realize the power of audio in everyday life. Noises alert us to our surroundings and can evoke emotion in subtle, yet effective ways. Music, while a distracting agent if overused, can add to the power of a message. If music is not appropriate to the learning objectives, sound effects that convey meaning to the content can provide both aural interface context cues and activity signals within the content.

While music and sound effects can add impact to training delivered online, most of the power we associate with audio for training purposes comes from the human voice. There is no substitute for the passion and power of a trainer's voice to convey meaning, emotion, and character to a message. Your learning audience will respond to the warmth and richness of a human voice, especially if they learn best through aural means.

There are a number of reasons to use audio and video in a production and appropriate times to use them for web-based training applications. Understanding why and when to use them are the first two steps in effectively deploying these tools for training. Next, you'll see how to plan and implement audio and video for web-based training.

How to Plan

The first step in successful use of A/V resources is knowing that pre-production is half the job. Proper planning will prevent excessive retakes using expensive studio time, equipment, and talent. Should you record your own audio and video for the production? Either way, you must perform initial planning tasks. For example, legal issues must be addressed early on. Before recording, make sure you have release forms for all participants agreeing that you can use their likeness and that they are old enough to enter into the agreement. You may also have to secure permits for certain activities or locations. Licensing and copyright are other legal issues that must be addressed if you are gathering content from outside sources or using existing footage or recordings. A one-time fee or royalty payment is often required for use of file or stock footage.

The importance of planning and coordinating the recording sessions cannot be underestimated. The logistics of equipment, studio or location setup, talent preparation, and proper recording conditions (weather, lighting, ambiance) must be considered before undertaking your own production.

One of the best ways to ensure that you get what you want out of an audio or video recording session is to produce a script and/or a storyboard. These items serve as the plan of action, roadmap, and backbone of the production. The script contains all of the spoken information and the storyboard carries the script one step further by adding graphical representations or descriptions of the visual aspects and actions of key frames.

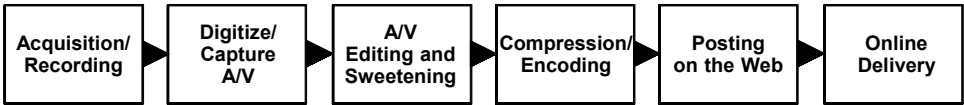
Another important decision point in the planning stages is the choice of media. While tape used to be the only way to go for recording, new techniques are now available. Digital tape choices can often provide higher quality audio and video reproduction. It is also possible to record directly into a digital format stored on a disk drive. As a safety tip, it is usually a good idea to plan for and record on more than one media type or to have a redundant recording device if your budget allows for it. It is cheaper to record the session on two devices than to pay for studio, equipment, and talent time twice if there is a technical problem. It is advisable that you hire experienced professionals if your budget allows for this. The additional cost is often saved both in time due to fewer retakes or errors and in frustration caused by inexperience.

You should also try to decide upon the final delivery format over the web during this planning stage. Making the decisions on which technology, frame size, image and/or sound quality, and compression techniques before you begin allows you to plan for some of the anomalies associated with implementing and delivering audio and video over the web before the recording begins.

How to Get Your Video and Audio on the Web

Once you have planned out the work, it is time to begin the process. Whether you are producing your own audio or video or using A/V resources from an outside organization, you will still go through a series of steps. The chart on the following page shows the typical steps:

A Typical Web-Based Audio and Video Production Process



Note that this is a simplistic view of the process. There are a number of specific subtasks depending on your particular tools. Some systems will require a different ordering of these operations. For instance, editing might take place before digitization if an older analog editing system is in use. Keep this process in mind as we look at techniques that are specific to delivering effective training using A/V resources.

Develop Once, Deliver Many

One of the most important adages in your successful deployment of any project involving multimedia is “develop once, deliver many.” In essence, any content that you take the time to develop should give you maximum return for the time and money spent by being flexible enough to repurpose into several media, formats, or uses. This is especially true of video and audio since they are two of the most expensive media types to produce. If you work from a high quality source material, it is easier to repurpose and convert to formats that require less resolution or quality. You can always scale down or convert an image or sound, but it is extremely difficult to increase resolution, clarity, and size and maintain the integrity of the original.

Once you have a high quality original A/V resource, you can convert it to a format for delivery through a VCR, CD-ROM, or, as we are discussing here, over the web. This is particularly true in the case of video. As an example, some video segments produced for web delivery have also been used as part of the curriculum in instructor-led training classes on the same subject. It is not always easy to deliver in multiple formats, as the size

variance requires different shooting techniques and shot choices. For example, when delivering video over the web, it is important to use many more close-ups and extreme close-ups than in normal videography for television delivery since the final delivery format will usually be quite small by comparison. These shot choices and edit decisions for web delivery may appear odd when viewed on a TV screen as most of us are used to greater shot variance (wide angles, medium shots, close-ups, extreme close-ups). It is usually even more problematic to take video developed for television display and maintain enough clarity in wide angle shots showing a great deal of detail when delivered over the web.

While “develop once, deliver many” should be the goal, it is often poorly executed when the requirements of different delivery formats are not taken into account. Careful planning can make this reuse possible, but it often requires returning to the original unedited source material in order to provide the most effective training experience to be delivered in different formats.

Downloadable vs. Streaming

Typically, audio and video can be delivered over the Internet using two techniques. The first technique is a traditional download of the entire A/V file. Upon successful download, the web browser then launches a helper application or starts a plug-in capable of A/V playback. The download process can take a long time on slower connections, and users generally grow bored waiting for the video unless they have a high-speed link. When this interruption occurs during instruction, the learner’s attention is broken. Unless a large high-resolution file must be transmitted, or the user cannot guarantee a fairly consistent data rate, this is not the best choice for delivering A/V material.

Streaming is a much more typical and effective technique. With streaming, an A/V file can start playing before it is finished downloading. This is accomplished by buffering (temporarily storing) a small portion of the video during the first few seconds

after the A/V file is launched and before play begins. While the file is playing, A/V content continues to load into the buffer. This process continues until the file is completely sent or the data transfer is slowed or stopped due to network congestion or other Internet difficulties. Streaming can be very effective for training even though the quality of the image and sound often suffers because of the high compression ratio necessary to deliver the A/V files in near real-time with minimal delays. Streaming can be effective on standard modem connections as it only sends the A/V content in manageable chunks while engaging the learner in the content as other parts of the file are being loaded.

Audio Formats

Audio can also be a useful distance learning component. Streaming tools such as Real Networks Real Audio, Apple QuickTime audio, Macromedia Shockwave Audio, Xing Technologies StreamWorks, and Microsoft NetShow can allow access to potentially large audio files in a matter of seconds. Streaming is one solution to the usual wait times associated with typical downloadable audio formats such as .au, .aiff, and .wav files.

Video Formats

There are also several streaming video technologies such as Real Networks RealVideo, Xing Technologies StreamWorks, Apple QuickTime (streaming format), and Microsoft NetShow that provide video with just a few seconds delay. These applications call for a particular video stream, buffer several seconds worth of continuous video data, and then attempt to continue buffering and playing the video. Network traffic can cause breaks or delays in the video stream, but with enough bandwidth, it is possible to keep a stream of video playing continuously without interruption or degradation in video quality. These streaming formats can take the place of downloadable formats like Microsoft's previous de facto standard, Video for Windows, .avi files, non-streaming QuickTime files, and non-streaming MPEG (Motion Picture Experts Group) files.

Compression

Compression can make low bandwidth multimedia delivery possible over Internet connections. For example, the bandwidth required for Streaming MPEG video could be around 96 Kbps (kilobits per second). The uncompressed segment at the same size and frame rate would be around 1 Mbps (megabits per second), ten times the bandwidth required with compression.

Intranet vs. Internet Deployment

Others have noted the difference in the multimedia data that can be handled by intranets and the Internet. Intranets can handle more data than the Internet in much the same way that most LANs can handle more data than the typical WAN. Most intranets are more than capable of handling audio and video. Heavy network traffic over the Internet and lower bandwidth connections are frequently the reasons that multimedia cannot be accommodated effectively over the Internet.

Multiformat

One solution to the morass of formats that are available for audio and video is to provide the learner with a choice. One approach is to provide resources based on the amount of bandwidth a learner has. For instance, a higher quality format might be offered for delivery over an intranet with a lower quality format available for Internet and dial-up connection support. The disadvantage to this technique is the extra time required to convert the videos into multiple formats. Still, it is often worth the effort to accommodate a larger learning audience.

Transcripts

Transcripts are another format that can be provided in a multiple format delivery solution. Providing a transcript over the web can be a lowest possible denominator solution for those people who have a very slow connection, do not have web browsers or plug-ins that allow for video, or for the disabled. A

transcript, with or without representative still images from an accompanying video, will help both hearing impaired learners as well as the visually impaired who have text-to-speech readers.

webCD Hybrid

In the spirit of multiple formats and “develop once, deliver many,” it is also possible to develop a Hybrid web and CD-ROM delivery method for training applications. For example, you could choose to put all of the A/V resources on a CD-ROM for fast delivery and playback. CD-ROM can also support larger frame sizes and higher resolutions of video and audio files. In this example, the web can be used for timely information that must be updated frequently and the associated CD-ROM would deliver general information and A/V resources. The CD-ROM must be shipped to the learner creating additional training logistics, but it is often worth it to have the increased reliability of CD-ROM, higher bandwidth, and larger file sizes.

Audio and Video Production

Whether or not you are developing your own audio and video training content, it is important for you to understand a few fundamentals of audio and video production in order to appreciate what goes into this complex process. Here you’ll learn a few basic tips about the specifics of audio and video production for web-based training. The following list provides information about the techniques involved in capturing audio and video training resources that are going to be digitized and delivered online.

Best Practices List

Because your product will eventually be delivered in a small, lower resolution box, it is important to do all that you can during video acquisition to make that media transition work as well as possible. Most of the items that follow are standard best practices for shooting video and recording audio, with a few added considerations:

1. Start with the highest quality video format available to your project. If you can't shoot Beta SP or Digital Video, then choose Hi-8 or S-VHS over composite video.
2. Always shoot in the best light possible. Natural light is best, followed by tungsten. For most corporate presentation situations, be sure that there is even lighting across the whole presentation area. If possible, do without standard overhead florescent lights—they put out an uneven spectrum and can add an annoying buzz to the audio track.
3. Don't forget to white balance the camera.
4. After lighting is set, set your exposure and lock it in. Do not use automatic exposure.
5. Always use a tripod and limit pans and zooms to those necessary, keeping them slow and smooth. The compression artifacts are most evident when the whole of the frame changes.
6. When possible, keep the background simple, and the subject(s) far enough away from any walls that would show shadows. (Some people have solved the background issue by using studio blue screens and adding the background later.)
7. Have your on-camera subjects avoid clothing with busy patterns. Plaids, checks, and thin stripes will scintillate on video and further degrade after digital compression.
8. When the spoken word carries the message, be sure to shoot the speaker a little tighter than usual. Use medium close-ups and close-ups for this.
9. In general, consider that your usual big screen will be reduced to something slightly smaller than a baseball card—so think ahead, and imagine the dynamics your

shot will have as a 3"x 2" image. (Pull your head back from the viewfinder for a preview.)

10. With all the emphasis on the image capture, don't forget audio. It is recommended that you plan for some audio redundancy. You may wish to capture audio in mono on more than one track, in more than one form for flexibility in translation. If you need to microphone a presenter and provide a room microphone to pick up audience questions, be prepared to mix the signals. Be sure to test audio levels before recording, and monitor audio as it is being recorded. Often a small problem with a cable or low batteries can be caught before any significant time has passed.

While everyone would like to get the best possible results when producing video, it is not always necessary to meet the production standards of broadcast specifications. This is especially true when delivering smaller video sizes over the web. A question to ask yourself is, "Does it have to be professional quality audio and video to be effective for learning?"

Certainly it has to be clear enough and of high enough quality to be comprehensible, but it does not have to be academy award-winning cinema to effectively teach people how to do something. While many people with video and audio production backgrounds might disagree, not everyone will have the time, budget, or know-how to produce high quality A/V resources. This does not mean you shouldn't try it. This is especially true if you are producing an internal video for an internal audience. "Industrial quality" or corporate video has been used for years. Over the current Internet, video and audio that conforms to the best practices above should be sufficient as a learning asset. The goal should be effective training, not an artistic masterpiece. If you need maximum quality in order to have a great, reusable asset, it is best to seek out professionals and take the extra time and money to produce a top notch A/V resource.


Case Studies

The following briefs give specific examples of some of the techniques described in the previous sections of this chapter. The first example we'll look at is the NASA Web Interactive Training (WIT) Project. Video content was used at the beginning of each section of the training to introduce a topic and engage the learner. In this project, a new methodology was used for the delivery of video content. Since not everyone had the proper bandwidth to receive higher quality streaming video available over the NASA intranet, two other options were provided and explained. This gave the user a choice based on what helper applications or plug-ins he or she had loaded. The second option was a downloadable video file that was usually between 5 and 6 Mb. The third option was a storyboard with all of the transcribed text and representative images from the video for 28.8 kbps modem users who could not accommodate either the larger format streaming video or the downloadable movie file. This technique made it possible to lower the minimum requirements for the course and still give the learner the option to access the most engaging experience when the proper equipment was available.

WIT Introduction with Video Choices

Netscape: Introduction to Nondestructive Evaluation


Location: <http://wit.ksc.nasa.gov/nde/ndeatkso.html>




Nondestructive Evaluation (NDE) at the Kennedy Space Center

[StreamWorks movie](#) *Select this option if you have downloaded the free Stream Works player.*
[Quicktime movie](#) *Select this option for a QuickTime version of the video. This may take several minutes to download.*
[Video Transcript](#) *Select this option if you do not have video capabilities.*

At the Kennedy Space Center, severe demands are placed on materials. Temperature extremes, aerodynamic forces, and dynamic loads combine to put materials under stress. These extremes are repeated each time a Shuttle flies. Therefore, Shuttle and ground support equipment (GSE) is carefully examined during processing between flights. Nondestructive evaluation (NDE) is a critical part of diagnosing potential problems before a launch.



*Columbia (STS-1) lifts off for the first time on April 12, 1981.
NASA photo 801-30450.*

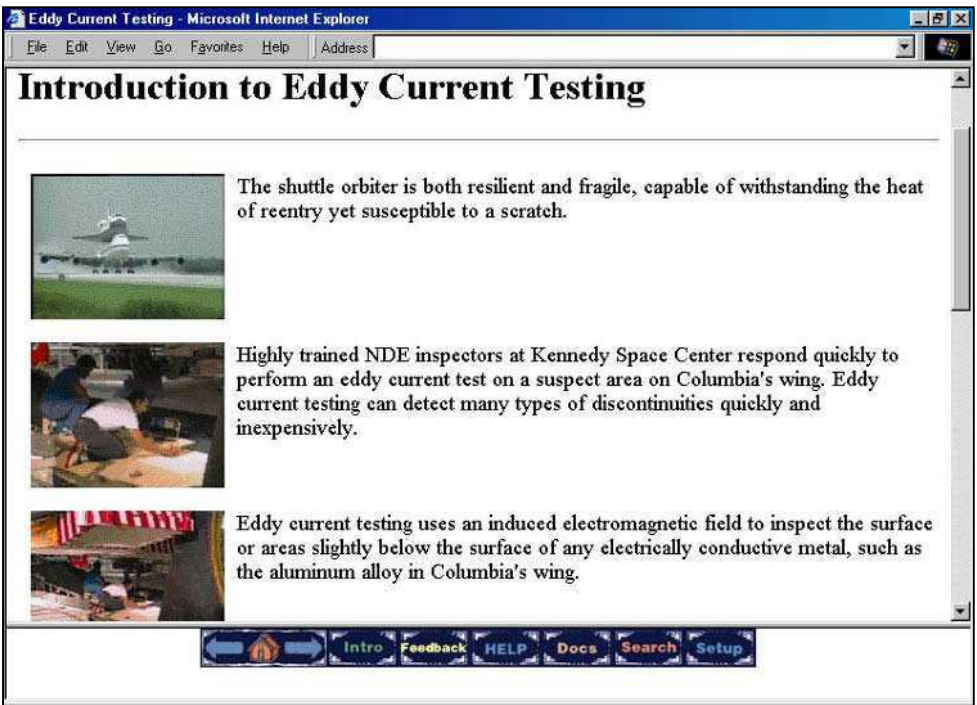


An example of destructive evaluation, a flameability test can measure, among other things, the flameability, heat release rates, and toxicity of the sample.




A number of nondestructive evaluation methods are used at Kennedy Space Center to evaluate flight hardware and ground support equipment, both in the field and the laboratory. Some of these methods

[Intro](#) [Feedback](#) [HELP](#) [Docs](#) [Search](#) [Setup](#)

WIT Online Storyboards/Transcripts



The screenshot shows a Microsoft Internet Explorer browser window titled "Eddy Current Testing - Microsoft Internet Explorer". The address bar is empty. The main content area has the heading "Introduction to Eddy Current Testing". Below the heading are three items, each consisting of a small image on the left and a text block on the right:

-  The shuttle orbiter is both resilient and fragile, capable of withstanding the heat of reentry yet susceptible to a scratch.
-  Highly trained NDE inspectors at Kennedy Space Center respond quickly to perform an eddy current test on a suspect area on Columbia's wing. Eddy current testing can detect many types of discontinuities quickly and inexpensively.
-  Eddy current testing uses an induced electromagnetic field to inspect the surface or areas slightly below the surface of any electrically conductive metal, such as the aluminum alloy in Columbia's wing.

At the bottom of the page, there is a navigation bar with several buttons: a home icon, a back icon, a forward icon, "Intro", "Feedback", "HELP", "Docs", "Search", and "Setup".


Next, RWD's CertificationNet provides online courses, tests, and certification programs to a global IT audience. It is impossible to know exactly what user technologies are possible with a worldwide audience, but a technique was developed to identify and correct setup problems before the learner starts a course. An automated web browser and plug-in-detection setup pages checked for browser compatibility and RealMedia's RealPlayer plug-in. A web-based lecture series for Cisco Systems and an introduction to SMC instruction are just two examples of CertificationNet courses that use streaming video or audio. The development team created a web-lecture format for instruction

that incorporates audio with synchronized still images of PowerPoint, live demonstrations, quizzes, and interactive exercises. This construction forms a more engaging learning experience than just watching an A/V presentation. This is the basis of the web-lecture format.

CertificationNet Setup Page

CertificationNet Setup and Configuration Checklist

Depending on the speed of your Internet connection, this automated CertificationNet setup and configuration checklist may take up to three and a half minutes. Checked boxes will indicate that your system appears to contain a necessary component.

Browser Features - You appear to be using IE 4.0		
<input checked="" type="checkbox"/>	Frames Support	Allows partitioning of the browser window into independent document display areas.
<input checked="" type="checkbox"/>	Tables Support	Allows data to be organized in columns and rows as well as for the organized layout of any element of HTML pages.
<input checked="" type="checkbox"/>	Cookie Support	A general mechanism which server side connections can use to both store and retrieve information on the client side of the connection. Note: if you are using a utility that disables cookie support, you will need to turn it off before proceeding through the CertificationNet instruction.
<input checked="" type="checkbox"/>	JavaScript Support	JavaScript increases the aesthetics and friendliness of websites by adding author-specified user events to static pages. Note: if Java Script is disabled on your browser, you will need to enable it. Consult your System Administrator or the Help menu on your browser to determine how to enable Java Script.
<input checked="" type="checkbox"/>	Java Support	<div style="text-align: center;">  </div> <p>Java is an object-oriented programming language. In this case it is used to deliver advanced content to your web browser. Note: if Java is disabled on your browser, you will need to enable it. Consult your System Administrator or the Help menu on your browser to determine how to enable Java.</p> <p>if you can see our CN logo fading in and out, your</p>

Used by permission of RWD Technologies®

Cisco Web-Based Lecture Course



Used by permission of RWD Technologies®

Last, Lawrence Livermore National Labs had a course developed using streaming media to deliver Integrated Safety Management (ISM) orientation training to their diverse group of new employees. In order to appeal to and engage a large portion of the learning population, personification was a desirable option for delivery. The initial prototype uses an on-screen agent or narrator guide transmitted as a streaming video file composited onto the web page. The guide interacts with the content while engaging the learner—much like a buddy system in a new-hire orientation session. Audio recordings with media synchronization are used for the actual trainer presentations. This promotes the proper authority and passion necessary to convey the importance of safety at the facility.

Lawrence Livermore National Labs ISM On-Screen Agent



Future Uses

In order to fully appreciate the current state of the art and what is possible with web-based delivery of A/V resources, it is necessary to look to cutting-edge technology and beyond.

New Standards

Standards play an important role in defining compatibility of development tools and delivery systems. Several new standards have been proposed and/or approved in the area of streaming media. The first is Synchronized Multimedia Integration Language (SMIL), pronounced "smile." As the name implies, the goal of this new language is to make it easy to synchronize text, audio, video, and other elements to a fixed timeline. This standard was recommended by the W3 Consortium in 1998.

Real-Time Transport Protocol (RTP) and the proposed Real-Time Streaming Protocol have been put forth by the Internet Engineering Task Force (IETF). Both are responsible for the delivery of real-time data over the Internet. Another project to watch is Instructional Management System (IMS). The project group is building specifications for handling learning objects that could be created in any medium. The structure for the data about audio or video files used in a training system will be part of this specification.

New Compression

In addition to new standards, new compression techniques are appearing that will allow even more video and audio data to be sent through low bandwidth connections (like a dial-up modem). Fractal and Wavelet compression techniques are already in use and are being improved upon to produce larger, crisper video images and higher quality audio. It is only a matter of time before we may see full-screen, full-motion video with CD quality audio through a dial-up connection.

A number of new techniques and technologies are becoming available as well. Because of the interactive nature of working with a computer versus the passive nature of televised video, new functions are possible. Some of these technologies may be a perfect fit to meet a learning objective. Consider an interactive video that allows the learner to select a hotspot in a moving video stream and change the course of action. With this technology you can create dynamic, scenario-based case studies. Other important technologies include panorama tools like QuickTimeVR, Microsoft's Surround Video, and LivePicture's PhotoVista. Panorama tools allow the learner to interactively pan and zoom around an object or through a view from a fixed point. While the technology uses a series of stills to form a 360-degree view, it gives the appearance of an interactive video window. True 2D and 3D animation is also possible through companion technologies to some of the new streaming media

formats for streaming 2D animation and Virtual Reality Modeling Language (VRML) for 3D animation. These technologies may be on the fringes of “video,” but they offer a few more options to add to your web-based training development toolkit. 3D sound is also a growing capability that expands the ability of your existing sound system to project complex sound scenarios. This may prove effective for certain types of aural training or for auditory effect.

This chapter has only covered the uses of one-way asynchronous audio and video. There are a host of other technologies that allow for two-way A/V communication and real-time A/V broadcast delivery. Other sections of this handbook will provide you with more detailed information about these possibilities.

Conclusion

By now you should have some ideas on the integration of A/V resources into your web-based training. Your understanding of the primary uses for audio and video to enhance learning is fundamental to effective deployment. Tips and techniques included in this chapter will augment the core best practices and procedural flow for delivering audio and video over the web. The case studies have demonstrated some of these techniques in practice. Finally, you can look toward the bright future of new tools and techniques that will allow you to create advanced learning scenarios through the integration of multimedia and the Internet. This integration will form completely new constructs to convey meaningful training. It will advance the state of web-based training with the use of audio and video as integral components of a new experience rather than stand-alone solutions.

Blended eLearning solutions must be engaging. The addition of audio, video, and animation can improve retention and provide a humanizing element to otherwise dry content. Video and audio from previously recorded events, like classroom sessions or presentations, can be integrated into asynchronous courses, or a performance support resources repository. Audio and video can

also prove very useful for capturing tacit knowledge that would not fit well into formalized, explicit training. For example, a best practices library of procedures with the “tips and tricks” commentary to go along with it could be an effective knowledge management intervention for capturing the knowledge in the heads of experts. Once a clip of video or audio is a digital asset, it can be used for a variety of purposes throughout the Blended eLearning continuum.

Collaboration and Blended eLearning

Typically, video/audio conferencing, satellite broadcast feeds, and live sessions have been used to deliver the instructional material in real-time. Two new categories of tools have surfaced in addition to these standard methods. Both involve Internet technologies. The first is the use of collaborative tools for delivering just-in-time performance assistance or training to a small group. These are often called Internet conferencing tools. The second is a relatively new class of instructional tools that emulate the more formal training classroom or auditorium through the web-browser as an interface. The following is the first of a two-part series.

Collaboration Tools for Performance Support

A class of software often referred to as Internet conferencing or collaborative support tools has sprung into existence over the past few years. Since that time, educators and trainers have been using these tools for small-group instruction. At first, most of these tools supported chat functionality and allowed groups to work on the same document at the same time. Chat functions and whiteboard functionality are still the most common implementations of these tools.

As an example, an instructor could begin a session with a small group of learners using a chat or discussion group tool to provide text and audio instruction in real-time over the Internet. In addition, some programs allow for video and presentations as

well. For collaborative teamwork or hands-on software application instruction, whiteboard functions and document sharing could also be useful. The whiteboard would allow everyone to contribute to a document or work task in a shared viewing space. Files and web URLs could also be transferred between student and instructor.

Before surveying the tools currently available for Internet conferencing, it is necessary to understand some general guidelines for evaluating the tools:

- Easy to set up and to contact people
- Standards-based H.323 compliance for cross-application audio conferencing
- Multiplatform support may also be important
- Multipoint data-conferencing functions as defined by the International Telecommunication Union's T.120 standard

Some of the most common characteristics associated with collaboration tools are as follows:

- Typically, 2 to 10 people interact using collaborative tools
- While one person can act as a moderator, all participants typically have equal access
- Real-time chat functions
- Small-group interaction
- More robust features like video already implemented
- Whiteboard
- File transfer
- Application and document sharing

There are a wide variety of tools that provide one or two of the functions found above. Chat and discussion tools like webBoard for discussion groups and iChat for real-time, and Java-based chat groups are available as well as many others listed on the book web-site.

For blended eLearning, collaboration fulfills an important role of providing a way for experienced individuals to learn and share their knowledge. This technique rounds out other methods. Some tools like discussion boards can capture tacit knowledge and also function as primitive document repositories for storing files and searching for information and files.

For example, an asynchronous course could have a link to a discussion board that forms a sort of “living document” for tracking responses to questions and examples from months or years worth of individuals who go through a course. In addition to answering questions and keeping the content fresh, this also serves to build a significant knowledge repository and also gives a feeling of “connectedness” to students, even if they are separated by time and space. Below is an example site from webBoard:

The screenshot shows a webBoard interface with a navigation bar at the top containing links for Post, Refresh, Search, Chat, Page, More..., Help, and Logoff. The main content area is titled "Conferences" and lists several topics, including "Pharma Sales Panel Discussion (7, 7 New)", "Difficult-to-see-Physicians (1 of 5)", "Marketing Materials (7)", and "CRM Support Materials (2)".

The first topic, "Difficult-to-see-Physicians (1 of 5)", is selected and shows the following details:

- Topic:** Difficult-to-see-Physicians (1 of 5), Read 107 times **new**
- Conf:** Pharma Sales Panel Discussion
- From:** James Amino jamino@rwd.com
- Date:** Tuesday, November 27, 2001 02:51 PM

The message content reads: "IMS data analysis indicates that every territory has top rated physicians with little to no access. The Market Research department surveys have stack ranked and analyzed data to find the territories with the most significant deviation from the norm. The territories with the most improved access to recent no-sees have been invited to discuss territory initiatives that they attribute to their above-average access."

The second topic, "Difficult-to-see-Physicians (2 of 5)", is also selected and shows the following details:

- Topic:** Difficult-to-see-Physicians (2 of 5), Read 120 times **new**
- Conf:** Pharma Sales Panel Discussion
- From:** Pat Rose prose@rwd.com
- Date:** Tuesday, November 27, 2001 02:53 PM

The message content reads: "My top rated physicians are almost all members of San Rio Health Networks. Bestavol was not on formulary so they would not even accept samples. I could not even get appointments. I knew that Worstofal was on formulary and that our pharmaco-economic data needed to be presented to create a ground swell of support. I knew I needed a creative solution and something to get their attention. I remembered that we once had a golf tournament with a hole-in-one prize of a BMW. We had purchased an insurance policy that would pay for the car. I worked with the Marketing Team and Tom Simpson my DM. We found an insurance company that would sell us a "hole-in-one" policy with a \$1,000,000 prize. The policy allowed up to 200 participants."

Used by permission of RWD Technologies®

The ability to have a whole team posting and contributing knowledge, documents, and chat-style collaboration can be a powerful addition to a blended eLearning strategy. Search capabilities and e-mail notifications of new information serve to keep the site “alive” and extend the learning beyond the web browser and typical learning functions. Arguably, discussion boards and other collaboration technologies like chat and shared whiteboards more closely emulate the cooperative learning style that has functioned for many generations.

Synchronous Tools

Next, we’ll review several views on how synchronous, real-time sessions can be effectively integrated into a blended eLearning strategy. First we’ll examine some of the implications for learning through this relatively new delivery method that few people have experienced to date. Typical features will be examined, along with a learning model for using synchronous tools effectively. We’ll also review the work of several experts in the field on approaches to integrating synchronous into a blended strategy.

Overview

Real-time lecture emulation provides a new way to deliver a presentation with slides, chat, two-way audience participation, voting, instructor control, and in some cases even advanced features like audio, video, CBT, and course management. These tools can be used for lectures, conferences, large- or small-group meetings, contests, training exercises, and any other event that requires real-time information and interaction to multiple locations.

Learning Implications

There are several benefits common to all synchronous tools. First, attendance can be tracked. In most of the applications, sessions can be recorded for students who cannot attend a

session, or for knowledge capture and creation of a web-based training course. Scheduled events can also increase a learner's motivation level by requiring interaction and participation. Learners do not feel trapped in cyberspace without support or human interaction. Another benefit of synchronous delivery is the ability to provide quick response to immediate training needs. Rapid instructional development is ideal for delivering instruction or information where development time is short. New product announcements, news-related training, or other up-to-the-minute instruction requires a delivery method that is much quicker than typical web-based training development. For instance, one hour of finished instruction in an online lecture tool can typically be developed in five hours according to vendor studies.

Another consideration is the cost of the tools. While they may seem expensive at first glance, consider what your organization must spend on tele/videoconferencing. Price is typically based on on-time charges that can show significant ROI numbers for an organization that has multiple locations and needs to conduct training between them. If these numbers don't quite convince you, think about all the travel savings over flying in associates from all over the country or world. The initial investment can pay for itself in no time if you currently use either of these methods to train within your organization.

Common Features

The field of tools is still wide open. Many of the applications have common features in addition to the unique features that will be highlighted in the following sections. The first common feature that defines the genre is the real-time functionality. The group participation features promote this real-time interaction. Several features like the presentation window, text chat windows, and audio controls are common among most of the tools discussed here. The presentation window allows a presenter to show a PowerPoint presentation, HTML pages, or graphics.

Some applications have a whiteboard function to highlight certain bits of information or to allow collaborative work. Most applications also have a two-way audio function in addition to the text chat capabilities.

Several features distinguish the virtual event tools from collaborative tools like those discussed previously. For example, instructor control over who gets to speak or take control of a function emulates the more formal environment of a classroom lecture. Instructors can also initiate student voting for informal class polls and event recording for future use or review. Another distinguishing characteristic is the number of students that can be involved in an event. While small groups can be formed, the lecture events can extend into the thousands if bandwidth and processing power are available. Most of these tools are web-browser based.

Incorporating a system or set of tools from both collaborative tools and synchronous software is an integral part of providing a blended eLearning solution. The inclusion of a collaborative learning tool and a structured classroom-type setting will give the instructors, subject matter experts, and most of all, the learners, a variety of electronic learning intervention options. In conjunction with a sound asynchronous WBT solution, real-time technologies for learning provide additional means to deliver instruction and meet learning objectives. Soon training managers and instructional designers will have as many options for electronic delivery of instruction as are currently available through traditional methods.

Best Practices for Synchronous Sessions

RWD Technologies[®] has developed many best practices over the years of logged hours producing and delivering synchronous learning. Here is a sampling of some of those best practices. The following elements are the basic building blocks of synchronous online learning interventions. The examples here are based on use in Centra Symposium, but similar best practices can be

applied in any synchronous learning application. These elements work in conjunction with one another to form the full experience of real-time, online learning.

Text

Text is used on presentation slides, as part of chat (described below), or as part of the information presented on web pages. The following guidelines for use apply:

- Text should be used sparingly. Long blocks of text will vary the pace that people can finish activities based on differences in reading speed.
- Bullet points augmented with graphics, audio, or other media types have proven more effective than stand-alone text.

If significant reading is required, consider making this part of the downloadable content that students should review before participating in the live session.

Audio

Audio is a fundamental component of the synchronous learning experience. In addition to the core content delivery, it conveys the instructor's excitement, pace, and feelings on the topic presented. Centra allows instructors to control who is allowed to speak. Using the microphone, the presenter can speak to the audience. It is also possible to grant microphone privileges to students for questions or to allow students to actively participate in the learning process. The following guidelines apply:

- Enunciation is important when using audio online or in a teleconference.
- Public chat, whiteboard text, or annotations on a slide reinforce key spoken points in text.

- Audio is an important part of the synchronous online learning experience. Without it, an effective learning session can still be hosted, but keeping the learner engaged becomes much more difficult. The pacing of a class without audio is 30 to 50 percent slower.

Students can participate by providing verbal response to questions or presenting their views in interactive sessions. Instructors and students should tune their audio using the Centra Audio Wizard before beginning the class session. Each student needs to have a microphone to make use of Centra's audio capabilities. If students don't have microphones or if there are bandwidth considerations, a separate conference call can be set up to handle the voice communications. While conference calls are convenient options, they eliminate the instructor's floor control capability (the ability to control who is speaking). For the initial eLearning course offerings, separate conference call provisions will be made rather than using Centra's audio capabilities.

Chat

Chat is familiar to many learners and may prove useful for sidebar activities, for response to technical questions (particularly audio problems), or to present information that is difficult to convey with the spoken word. Here are guidelines for effectively using chat functions. Typing speeds of students vary. Some students who are slower than others can be intimidated by this factor. Public chat can be useful if there are audio problems or bandwidth concerns. Private chat is useful for having sidebars with students to work independently without other students knowing. This is important for catching students up and helping with problems that might prove embarrassing for them to discuss in front of other students. Chat can be a distraction for both students and instructors.

Slides

Slides are the underlying organizational construct used in Centra. Slides are just one type of agenda item, but they often form the backbone of the instructional flow. Visuals that reinforce the audible message are important for engaging learners who respond to various learning styles. Seeing what they are hearing will reinforce the learning. Present objectives and map out the flow of instructional material using slides. Slides should follow good graphic design and layout principles. The more complex a slide is, the longer it can take to load. This is usually not an issue unless connection speeds are unusually slow. Students tire easily of watching slide after slide from a PowerPoint presentation. Instruction should be broken into logical units (based on objectives perhaps), and other interventions should occur in conjunction with slides. The following sections provide detail on types of interventions and activities that can be useful in meeting learning objectives. These include: WebSafaris, Surveys/Polls, Online Labs, Breakout Rooms, Evaluations. Screen builds can be emulated by duplicating slides in PowerPoint with each progressive line or graphic element building upon the others. This process is more time consuming and can be difficult if edits are required. The best use of this feature is showing segments or components of large process diagrams. Text should be formatted according to group presentation guidelines. Text sizes below 20 points and illegible fonts (decorative styles and elaborate treatments) should not be used. Sans serif fonts (like Arial) improve readability. Text should be on a solid color background with no gradients.

Advanced Features of Synchronous Learning

Whiteboard

A whiteboard can be a group work area for sharing collaborative ideas, or a place for the instructor to dynamically show a process, a complex diagram, or to dissect a graphic. Centra allows presenters to paste a graphic into the background for markup or to create simple shapes and annotations in the whiteboard area. These items can be archived as part of online course materials. The whiteboard is best used to show graphics or screen shots that require some interaction between instructor and student and/or visual explanation. Screen captures can be pasted and marked up on the shared whiteboard. Group exercises or impromptu reviews of difficult concepts can be performed using this feature. The whiteboard can be used to capture and record text for summaries or lists of user concerns. Complex process flows can be described and mapped out visually to improve understanding.

Application Sharing

Application sharing allows the presenter to show step-by-step processes to the audience. This is possible even if the audience member does not have the software application that is being shown. Application sharing allows the instructor to show an application before it has been rolled out for use in the organization. Application sharing is very effective for showing live demonstrations of complex operations in software applications. Audio is very important in this process. Instructors should speak slowly and provide time for novice users to get accustomed to the tool and to get their visual bearings within the interface being shown. This operation is more bandwidth intensive than other functions within Centra. Small screen sizes work best to ensure that student computers/network connections are keeping pace. For reinforcement, the instructor can turn control over to a student and let them demonstrate an application to show their

understanding of an operation that is being performed. This can be done in a large group or in breakout rooms as described below (not recommended if students are connected via phone line).

WebSafaris

WebSafaris are useful when additional information is required or when instructional resources already exist on the web. An example would be accessing an online instruction manual in the company knowledge domain. Also, more applications have web interfaces. Instructors may allow practice with a live system through webSafaris.

WebSafaris provide an engaging tour of websites that the instructor can show to the students. This is useful in demonstrating the use of web interfaces or providing relevant information that supplements the course content. Instructors can also allow students to engage in discovery learning exercises by giving them control of the web individually or in breakout rooms. Timed research or hunts for specific information can be a challenging way to engage students and provide a friendly element of competition. The first student or group to provide the correct information or to complete the given task “wins.”

Surveys/Polls

Surveys and polls are effective ways to make sure students are still engaged and keeping pace with the instruction. Instructors use these periodically to elicit feedback from the audience on pacing, comprehension, and so forth. Students are much more likely to provide honest feedback about their learning experience through the anonymous surveys/polls. Student comments from classes that use this technique show an appreciation for the value placed on their opinion or unique situation. This helps students stay focused and engaged.

Group Activities/Breakout Rooms

To accomplish more in a given session, it is possible to break the large group into smaller, working groups through the use of breakout rooms. Instructors can assign tasks and agenda content to the room. Students can practice given exercises or go through application share activities. Results of the breakout room can be presented back to the overall group. Instructors should monitor the breakout rooms to ensure that there are no logistical issues and that learners are staying on task.

Breakout rooms cannot be recorded. Online labs, breakout rooms, and application sharing in breakout rooms can form a laboratory environment. Within the Centra environment, instructors should provide the application sharing screen AND a slide or two of detailed instructions as part of the agenda items that are included in the breakout room.

Long procedures can be broken down into manageable steps by objective. Online labs can be broken up with instruction/discussion between objectives so that learners have a chance to get feedback and ask questions without having to interrupt the flow of the prescribed instructional activities.

Q/A Sessions

Question and answer sessions allow students to get clarification on key points and serve as reinforcement. Providing enough time for this in the lesson planning is an important way to show concern for the student's individual needs and effective learning. Reserving time for question and answer is an important part of synchronous sessions. Students often feel alone, "disembodied," or lost in cyberspace without the aid of a caring human instructor. The importance of answering questions cannot be understated when online. Often, instructors set aside time at the end of a session. This is appropriate, but should be augmented with time for questions at key points throughout the session. Students who are reluctant to raise their hands and speak will often ask questions through chat to avoid embarrassment. Instructors

should keep the person's identity anonymous, but answer the question for the whole group through the microphone or public chat.

Evaluations

Evaluations are an important benchmark to an overall competency management strategy. People will do what is measured. In order to measure competency and apply the Kirkpatrick model, instructors should have an evaluation at the end of modules, if not after each objective. If corporate culture does not favor evaluations, knowledge checks can be implemented to provide immediate feedback without recording results for each student. Instructors will want to clearly distinguish between the lower stake Knowledge Checks and the higher stake Evaluations.

- Evaluations can be graded or ungraded. They can also be timed or untimed.
- Evaluations are best used as reinforcement of key objectives and as remediation.

Many learners are intimidated by testing. The instructor should make the evaluation process fun and engaging. One possible approach is to appeal to people's gaming spirit by approaching evaluations like a challenging round of a game show.

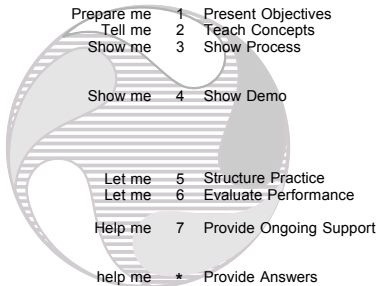
RWD Adult Learning Model

Application of the RWD Learning Model

Learning Model (student need)

Methodology (instructor response)

Possible Agenda (learning tools)



Prepare me	1	Present Objectives
Tell me	2	Teach Concepts
Show me	3	Show Process
Show me	4	Show Demo
Let me	5	Structure Practice
Let me	6	Evaluate Performance
Help me	7	Provide Ongoing Support
help me	*	Provide Answers

Slides
Slides
Annotated graphical slides, or whiteboard activities showing processes in a visual format
Live demonstration of the process or objective element using application sharing or webSafari if the web is accessible
Breakout session or online lab
Evaluations to reinforce key points and to display competency
Make instructional material available through recording and playback
Questions and answers, surveys and polls are used throughout the process

Learning Tools
RWD proven to achieve results (low-tech to high-tech)

Job aids
Self-study procedures
Instructor-led classroom
Web-based on-the-job training
Computer-based training
Interactive multimedia
Distance learning
Performance support

- (1) Objectives developed and presented on slides [prepare me]
- (2) Slides showing core conceptual information [tell me]
- (3) Annotated graphical slides or whiteboard activities showing processes in a visual format [show me]
- (4) A live demonstration of the process or objective element using application sharing or web-Safari if the application is web-accessible [show me]
- (5) A breakout session or online lab allowing students to practice what they have been exposed to [let me]
- (6) Evaluations to reinforce key points and to display competency [let me]
- (7) Instructional material made available through recording/playback for ongoing performance support [help me]
- (8) Q/A, surveys, and polls throughout the entire process [help me]

Based on the graphic above and an example such as, “*Given 20 minutes of instruction and a practice exercise in the training environment, be able to 100 percent correctly demonstrate the log-in procedure to SAP,*” it is possible to outline a sample application of the online learning interventions.

Prepare Me

Developing an online course requires the same adherence to sound instructional design procedures as development of a traditional classroom training session. The first step is to define the instructional objectives. This is part of the “prepare me” step in RWD Technologies’[®] instructional methodology. Producing a slide with a clearly defined module is an important first step. Other activities that may be included in this step include the definition and placement of downloadable or streaming pre-reading to get the learners to a common baseline for beginning the synchronous instruction. Definitions of unfamiliar terms or background rationale for the log-in procedure might be useful information to have students learn in advance of a class.

Tell Me

At the same time that the instructor or course designer is building the slide(s) showing the objective, definition of key concepts can also be built in PowerPoint for later conversion into agenda items. Understanding the key elements of the log-in screens and the importance of the procedure to the overall navigation are example uses. This is part of the “tell me” step in RWD Technologies’[®] instructional methodology.

Show Me

As shown in the third step of the graphic above, process slides could also be built in PowerPoint or as separate images to include on a whiteboard agenda item. Instructors can use these slides to show process steps and annotate them to outline a roadmap for the demonstration of the procedure. Providing a high-level overview of an application’s log-in screen order helps

set learner expectations and reinforces the process. Application sharing or a web-Safari agenda item can be used to actually show a software application in action. These items form the core of the “show me” step in RWD Technologies’[®] model.

Let Me

Allowing the students to go through an actual log-in is an important step that will aid in retention and reinforce the demonstration provided by the instructor. In Centra, breakout rooms or online labs can be setup for individuals or groups to go through the procedure. This forms the core of the “let me” step in RWD Technologies’[®] instructional methodology. Evaluations can also reinforce key points and call for the application of knowledge.

Help Me

The final step in RWD Technologies’[®] methodology is an ongoing effort to improve the performance of learners inside and beyond the one-time, classroom learning event. With this in mind, several Centra features can be used throughout the learning event and after the event. At the end of the session, a question-and-answer session will help students wrap up and clarify any remaining issues. Throughout the module, knowledge checks can be performed with Centra’s survey feature and anonymous polling for comprehension and pace. These “help me” elements should be injected at key points in the instruction to help engage the learner in the content. Another feature that could be useful for ongoing reinforcement is the record function. This would make them available for review at a later date as part of an ongoing reinforcement and performance-based learning solution.

This recommended process flow for applying a sound instructional development model and the unique features of Centra is a starting point for achieving the desired learner outcomes. Modifications and creative uses of the available features may be appropriate based on differences in content, audience, and complexity of the work.

Achieving Success with Blended Learning by Harvi Singh and Chris Reed, Centra Software*

Introduction

What impact would it have on your organization if you could launch new products in days versus weeks? What if you could give your sales and service staffs 2 to 4 percent more time each year to work with their clients? What if you could provide management training that is more personalized and effective than what you are buying today, yet far less expensive? What if your top performers could immediately leverage their expertise across the organization without impacting their personal productivity? These are some of the benefits that early adopters of eLearning are achieving with “blended learning” strategies. If we take the long view, traditional physical classrooms have been the dominant form of knowledge transfer for at least 3,000 years. Even today, nearly 80 percent of corporate training is conducted in the classroom. The last universal technology in learning, the printed book, is over 500 years old. Yet in the past 10 years alone, over 10 major new technologies for learning and collaboration have been introduced. Early experience with these technologies has uncovered opportunities for profound improvements in quality, effectiveness, convenience, and cost of learning experiences. It has also resulted in many disappointments. For example, self-paced courseware has seen wide deployment but, on average, is effectively used by only 11 percent of its target audience. Only now are we beginning to understand how learning experiences will evolve to exploit “blended” combinations of both traditional and technology-based learning methods, and how blended learning can have a strategic impact on critical business processes.

*(Used by permission, Centra)

Organizations today are looking beyond the automation of traditional training models to new approaches to knowledge transfer and performance support that are better aligned with business goals and deliver measurable results. By focusing on the specific business objective, rather than the learning technology, we are given the opportunity to fundamentally re-think how we design and deliver learning programs. This re-thinking also allows us to break free from the concept of a “course” and consider approaches that provide a continuous learning process with active participation by the entire organization in sharing, teaching, and mentoring mission-critical knowledge. This white paper shares cutting-edge research and thinking on blended learning as it explores: What is blended learning? Why blend? How do you blend? Where does one start?

What is Blended Learning?

Simply put, blended learning can be described as a learning program where more than one delivery mode is being used with the objective of optimizing the learning outcome and cost of program delivery. However, it is not the mixing and matching of different learning delivery modes by itself that is of significance, but the focus on the learning and business outcome. Therefore, we propose to refine this definition to say:

Blended learning focuses on optimizing achievement of learning objectives by applying the “right” learning technologies to match the “right” personal learning style to transfer the “right” skills to the “right” person at the “right” time.

Embedded in this definition are the following principles:

- We are focusing on the learning objective rather than the method of delivery
- Many different personal learning styles need to be supported to reach broad audiences

- Each of us brings different knowledge into the learning experience
- In many cases, the most effective learning strategy is “just-what-I-need, just-in-time”

The experience of pioneers in blended learning shows that putting these principles into practice can result in radical improvements in the effectiveness, reach, and cost-effectiveness of learning programs relative to traditional approaches. These improvements are so profound that they have the potential to change the overall competitiveness of entire organizations. Before we share some of this research, let us look at some of the “dimensions of the blend.”

Dimensions of the Blend

The original use of the phrase *blended learning* was often associated with simply linking traditional classroom training to eLearning activities. However, the term has evolved to encompass a much richer set of learning strategy “dimensions.” Today a blended learning program may combine one or more of the following dimensions, although many of these have overlapping attributes.

Blending Offline and Online Learning

At the simplest level, a blended learning experience combines offline and online forms of learning where the online learning usually means “over the Internet or intranet,” and offline learning happens in a more traditional classroom setting. We assume that even the offline learning offerings are managed through an online learning system. An example of this type of blending may include a learning program that provides study materials and research resources over the web while providing instructor-led, classroom training sessions as the main medium of instruction.

Blending Self-Paced and Live, Collaborative Learning

Self-paced learning implies solitary, on-demand learning at a pace that is managed or controlled by the learner. Collaborative learning on the other hand implies a more dynamic communication among many learners that brings about knowledge sharing. The blending of self-paced and collaborative learning may include review of important literature on a regulatory change or new product followed by a moderated, live online, peer-to-peer discussion of the material's application to the learner's job and customers.

Blending Structured and Unstructured Learning

Not all forms of learning imply a pre-meditated, structured or formal learning program with organized content in specific sequence like chapters in a textbook. In fact, most learning in the workplace occurs in an unstructured form such as meetings, hallway conversations, and e-mail. A blended program design may look to capture active conversations and documents from unstructured learning events into knowledge repositories available on-demand, supporting the way knowledge-workers collaborate and work.

Blending Custom Content with Off-the-Shelf Content

Off-the-shelf content is by definition generic—unaware of your organization's unique context and requirements. However, generic content is much less expensive to buy and frequently has higher production values than custom content you build yourself. Generic, self-paced content can be customized today with a blend of live experiences (classroom or online) or through content customization. Industry standards such as SCORM (Shareable Courseware Object Reference Model) open the door to greater flexibility in blending off-the-shelf and custom content—improving the user experience while minimizing cost.

Blending Work and Learning

Ultimately, the true success and effectiveness of learning in organizations are believed to be associated with the paradigm where work (such as business applications) and learning are inseparable, and where learning is embedded in business processes such as hiring, sales, or product development. Work becomes a source of learning content to be shared, and more learning content becomes accessible on-demand and in the context of the user's workplace need. What should be evident from the above discussion is that many of the implicit constraints of time, geography, and format that we accepted with the physical classroom are no longer valid. Even the fundamental organizing construct of a "course" can be transformed into an ongoing learning process or experience.

Ingredients of the Blend

Blended learning is not new. However, in the past, the ingredients for blended learning were limited to physical classroom formats (lectures, labs, etc.), books, or handouts. Today organizations have myriad learning approaches to choose from, including but not limited to:

Synchronous physical formats:

- Instructor-led classrooms and lectures
- Hands-on labs and workshops
- Field trips

Synchronous online formats (live eLearning):

- eMeetings
- Virtual classrooms
- Web seminars and broadcasts
- Coaching
- Instant messaging

Self-paced, asynchronous formats:

- Documents and web pages
- Web-computer-based training modules
- Assessments/tests and surveys
- Simulations
- Job aids and electronic performance support systems (EPSS)
- Recorded live events
- Online learning communities and discussion forums

Blended Learning—A “Real-World” Example

These concepts may be best visualized by contrasting a traditional, single-mode, lecture-style classroom program with a program that applies blended learning principles. Let's use a new employee orientation program as an example. The traditional approach may typically involve a two- to three-week classroom-training course where all the new employees are introduced to company products, philosophy, vision, etc. This classroom-training course usually takes place in a contiguous block of time before a new employee is introduced to the actual work and performance expectations are set. In contrast, a blended collaborative eLearning program (carried out over a longer span of time) can help balance learning and performance by creating a recipe that includes:

- Interactive online opportunities *before the employee starts work* to introduce them to learning resources and their team, and enable them to be better prepared for success
- A physical classroom kick-off event for acculturation and teambuilding
- A series of self-paced, online tutorials covering the company's product or service

- An asynchronous, online discussion forum created to allow participants to share customer case studies or scenarios
- A series of live, collaborative coaching sessions where the new employees talk with members of the management team
- An online, web-based post-test that certifies the competency of new employees
- An online survey that allows participants to provide their feedback about the learning program for future improvements

Beyond the short initial kick-off session, the remainder of these events takes place in the employee's work context over an extended period of time—minimizing the employee's time-to-productivity while fostering internalization and application of key learning in the job context.

The “Right” Ingredients of a Blended Program

Creating a blended learning strategy is an evolutionary process. You will need to explore the capabilities of your team, your organization's infrastructure, and your learners' receptiveness to new learning formats. For many, the first stage in their blended learning program initiative is to supplement their current programs, either traditional classroom or self-paced content libraries, with live eLearning activities (coaching, virtual classrooms, or workshops) to extend the learning process and better integrate it with the work environment. Once you have built experience and confidence using the key tools available to you, it is appropriate to invest more effort in a thorough redesign of your learning programs for maximum business impact. Here is a high-level process that can guide you through some of the key decisions in this program design:

Every learning initiative should start with clarity on the program's business and performance objectives. What should the participant or learner be able to do upon completion of the learning program to advance your business? With that goal in mind, you need to perform an instructional design analysis, but with some new twists reflecting the broader range of design options available to you.

Audience analysis is essential to determine which delivery options will be effective in achieving your performance objective. This analysis needs to consider several key factors, including but not limited to the following:

- **Base knowledge**—how uniform is the knowledge that they are bringing to the learning program?
- **Preferred learning styles**—while learning styles do vary by individual, different communities frequently share learning style preferences.

Business users and sales professionals tend to respond best to learning formats that are collaborative, visual, verbal, and nonlinear. IT staff are generally more comfortable with formats that are linear, factual, tactile, and individual. What range of styles will you need to support?

- **Location**—is the audience centralized or distributed?
- **Motivation**—what is the level of effort, inconvenience, or cost they are willing to incur in order to obtain the learning you are offering?
- **Access**—which elements of the program does the audience view as a base competency to be achieved in advance of need versus a resource to be accessed on demand?

Content analysis will often guide you in the selection of the optimal delivery formats.

You will have the most options with simple knowledge transfer programs, but should consider the impact on retention when adding interaction with both the audience and content. You now have options not available in most classrooms for access to diverse content and tools such as bi-directional application sharing, games, and simulations. Some forms of content—e.g., intense behavioral modification, complex physical skills—might only be effectively delivered in face-to-face formats. It is also important to understand how dynamic the content in your program is. Launching a new product will generally result in a rapid evolution of content as input from the field and customers is captured and integrated. Programs with this content behavior generally need to remain in a live format to facilitate continuous content evolution and refinement.

Financial analysis of both your content development and delivery costs could play a significant role in deciding the delivery options. The primary financial advantage of self-paced content is its low delivery cost relative to live formats. However, producing a highly interactive and media rich self-paced training program may cost many thousands of dollars per hour of delivered content, and several weeks of development time. Content from traditional classrooms or live eLearning can be quickly and inexpensively developed. Studies have shown that, despite its higher delivery costs, live learning formats are generally more cost-effective unless you have stable content to be delivered to audiences of several thousand or more.

Infrastructure may constrain your delivery options. Classroom capacity is frequently a constraint on the speed with which you can train a community. Mobile devices have different screen sizes and network access than PCs. Unless you are very fortunate, you will generally not have sufficient network bandwidth available for full-motion video. Luckily, the most popular eLearning technologies such as WBT and live eLearning are

generally compatible with existing infrastructure since they can operate over very low-bandwidth network connections. The appendix to this white paper is a Blended Learning Strategy Guide—this tool is designed to guide you in applying all of this thinking to your particular learning initiative.

Why Blend? The Benefits of Blending

The concept of blended learning is rooted in the idea that learning is not just a one-time event—but that learning is a *continuous process*. Blending provides various benefits over using any single learning delivery type alone.

Improved Learning Effectiveness

Recent studies at the University of Tennessee and Stanford give us evidence that a blended learning strategy actually improves learning outcomes by providing a better match between how a learner wants to learn and the learning program that is offered.

Extending the Reach

A single delivery mode inevitably limits the reach of a learning program or critical knowledge transfer in some form or fashion. For example, a physical classroom-training program limits access to only those who can participate at a fixed time and location, whereas a virtual classroom event is inclusive of a remote audience, and when followed up with recorded knowledge objects (ability to playback a recorded live event), can extend the reach to those who could not attend at a specific time.

Optimizing Development Cost and Time

Combining different delivery modes has the potential to balance out and optimize the learning program development and deployment cost and time. A hundred percent online, self-paced, media-rich, web-based training content may be too expensive to produce (requiring multiple resources and skills), but combining virtual collaborative learning forums and coaching sessions with

simpler self-paced materials such as generic off-the-shelf WBT, documents, case studies, recorded live eLearning events, text assignments, and PowerPoint presentations (requiring quicker turn-around time and lower skill to produce) may be just as effective or more effective.

Optimizing Business Results

Organizations report exceptional results from their initial blended learning initiatives. Learning objectives can be obtained in 50 percent less class time than traditional strategies. Travel costs and time have been reduced by up to 85 percent. Acceleration of mission-critical knowledge to channels and customers can have a profound impact on the organization's top line.

Evidence That Blending Works

We are early into the evolution of blended learning. Little formal research exists on how to construct the most effective blended program designs. However, research from institutions such as Stanford University and the University of Tennessee has given us valuable insight into some of the mechanisms by which blended learning is better than both traditional methods and individual forms of eLearning technology alone. This research gives us confidence that blending not only offers us the ability to be more efficient in delivering learning, but also more effective. Stanford University has over 10 years of experience with self-paced enrichment programs for gifted youth. Their problem, however, was that only slightly more than half of their highly motivated students would actually complete their programs. They diagnosed the issue as a mismatch between the student's desired learning style—interactive, social, mentored learning—with the program's delivery format. The introduction of live eLearning into their program to address these needs raised student completion rates to 94 percent. The improvement was attributed to the ability of a scheduled live event to motivate

learners to complete self-paced materials on time, the availability of interaction with instructors and peers, and higher quality mentoring experiences. Earlier we shared the research that only 11 percent of the employees offered self-paced eLearning take advantage of it today. The Stanford research strongly suggests that linking self-paced material to live eLearning delivery could have a profound effect on overall usage and completion rates—enabling organizations to radically increase the return on their existing investments in self-paced content.

Research by the University of Tennessee's Physician's Executive MBA (PEMBA) program for mid-career doctors has demonstrated that blended learning programs can be completed in approximately one-half of the time and at less than half of the cost using a rich mix of live eLearning, and self-paced and physical classroom delivery. Of even greater interest, this well-designed program was able to demonstrate an overall 10 percent better learning outcome than using the traditional classroom learning format alone. This represents the first formal study to show significant improvements from eLearning rather than just equivalent outcomes. This exceptional result was attributed by PEMBA to the richness of the blended experience that included multiple forms of physical and virtual live eLearning, combined with the ability of the students to test their learning in the work context immediately and collaborate with peers on its adaptation to their unique environments.

Taken together, these studies show us that, regardless of whether your starting point is the traditional classroom or self-paced eLearning, the diversity of a blended learning experience appears to have a significant impact on the overall effectiveness of a learning program relative to any individual learning delivery method alone. But how do you bring some of these benefits to your organization?

How Do You Get Started with Blended Learning?

You need to approach blended learning as a journey rather than a destination. The first steps along the journey are to build experience with the individual foundations of any blended learning strategy—self-paced learning content and live eLearning—to understand their strengths and weaknesses in your business context. The good news is that this first step has consistently demonstrated quick financial paybacks and strong user acceptance.

The next step is to begin experimenting with the “dimensions of the blend” discussed in this paper. Use the guide to help you focus your design. You may find it useful to implement learning content management capabilities that enable you to link together self-paced content and live learning activities into managed blended learning programs. When you select your first blended learning project, you should approach it as you would any significant organizational change by ensuring the following project criteria can be met:

- **Clear, High Value, Business Justification Case**—to achieve executive sponsorship
- **Executive Sponsorship**—to provide the resources and management support required
- **Committed Project Team**—to execute project regardless of obstacles
- **Change Management Strategy**—to anticipate and overcome resistance to change
- **Responsive Vendors**—to provide resources and expertise for your success
- **A Deadline**—to maintain focus and commitment

Conclusion

Organizations are rapidly discovering that blended learning is not only more time and cost-effective, but provides a more natural way to learn and work. Organizations that are in the forefront of this next generation of learning will have more productive staffs, be more agile in implementing change, and be more successful in achieving their goals. To paraphrase Jack Welch, legendary chairman of General Electric, the ability of an organization to learn, and rapidly convert that learning into action, is the ultimate source of competitive advantage.

Organizations must look beyond the traditional boundaries of classroom instruction by augmenting their current best practices with new advances in learning and collaboration technologies to maximize results. More importantly, organizations must seek to empower every individual in the organization to become an active participant in the learning and collaboration process. We encourage you to practice blended learning in your organization. Additional examples of tools and late-breaking strategies and best practices can be found at <http://www.blended-elearning.com>.

Chapter 11

Rapid Authoring and Delivery Tools

Overview

As we pointed out earlier, LCMS technologies for blended eLearning have, in many ways, taken center stage in the eLearning world today, and one of the main reasons for this phenomenon is that they offer rapid development, reuse, deployment, distribution, and maintenance of all types of learning content that supports performance improvement and knowledge management. However, this technology area is so new that it is often carried out in a variety of proprietary ways. For this reason, we have included in this chapter four distinct vendor approaches, which (using much of their own documentation) demonstrate how rapid content development and delivery can be effectively implemented and managed at either the business unit or enterprise level.

The precise learning, performance support, or knowledge management content that is either generated or managed by these systems fits a variety of business needs, whether this be simulation (RWD Technologies[®] Info Pak Simulator), competency modeling and management (DDI's Opal), content propagation and distribution (Cisco's AVVID), or complete learning content platform management (Outstart). The systems referenced below will, no doubt, continue to evolve over time, just as they may be renamed, acquired, merged, or even taken off the market in due course. Nonetheless, for now they represent unique and distinct approaches to the rapid content development and management area, and we would encourage our

readers to visit the book's companion web-site at www.blended-elearning.com to get up-to-date information on these tools and others that support rapid content creation and delivery systems within blended eLearning solutions.

Info Pak Simulator (RWD Technologies®)

RWD's Info Pak Simulator provides end users with customized, reality-based training that is easy, affordable, and convenient to produce. The Info Pak Simulator, which is based on Paragon's technology, creates customized, interactive training simulations for any Windows-based application. The simulator essentially records actions as users work through a particular task or application. As they use these applications, the simulator "watches" and records all interactions including menu selections, data entry, and mouse clicks. The simulator also provides easy-to-use editing functionality that allows one to supplement a recording with notes or voice overlays. Once complete, the simulation then exports a Java applet or a collection of dynamic HTML files for use in web-based training sources, classroom-based training, or embedding into an online help system. The benefits of the Info Pak Simulator include:

- Reduced training cost by as much as 50 percent
- Learners become productive sooner
- Time away from desk is reduced
- Help Desk and Support group requests reduced

The features of Info Pak Simulator include:

- eLearning delivery of content
- Flexible and easy to use
- Multiple delivery modes
- Automated recording
- Customizable with text notes and audio files

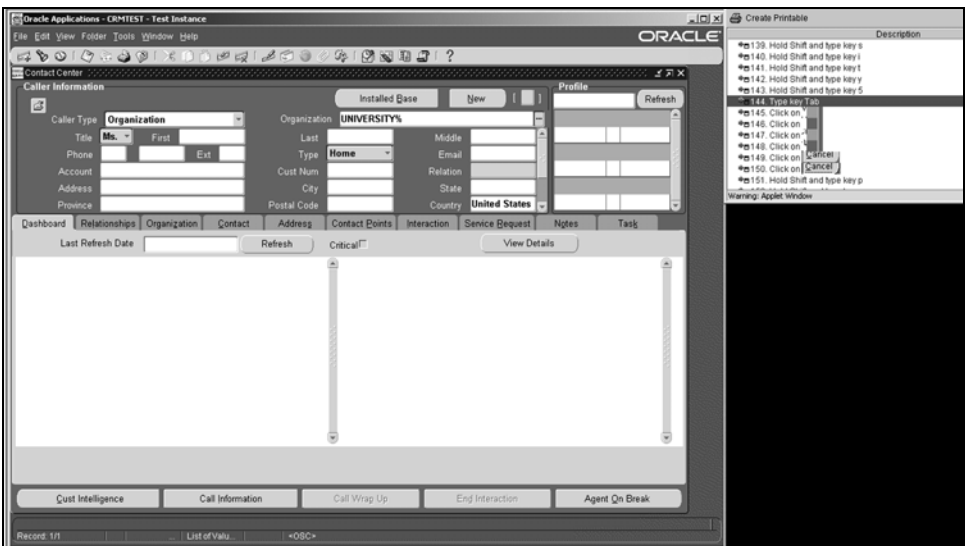
In part, the power of RWD's Info Pak Simulator comes from its ease of use, whereby there is no need to know programming or scripting languages in order to generate a recorded event. And step-by-step tutorials are easily created in a "record" and "replay" mode, which allows for continuous and rapid updating of training material and user documentation. Training and documentation developers require only a live connection to an application to use Info Pak Simulator. They start the process by determining what is to be captured. Each interaction is then recorded automatically. Once complete, a recording can be edited to include text annotations and audio files.

The RWD Info Pak Simulator features dynamic, real-life experiences with new applications at a fraction of the cost of traditional training approaches. This "reality-based" training tool therefore creates the same kind of training content you would see if connected to a live system or working with an instructor. Because the simulations can be run and saved for future training requirements, Info Pak Simulator allows trainers to reach any group of users over the Internet or corporate intranet from any location, at any time. From one recording, you can even create up to three separate simulations by using the Auto Playback, Standard, and Self-test modes:

- In Auto Playback mode, the simulation resembles a camcorder recording the task. The learner can play, pause, or stop the playback. This mode is useful for someone with little or no experience with an application.
- In Standard mode, the learner is guided through the task. The system provides step-by-step instructions for completing the task. Within Standard mode, the author has had the opportunity to annotate the task with relevant information, making the information very useful to the learner.

- In Self-test mode, the instructions and visible clues found in the Standard mode are no longer present, giving the learner the opportunity to complete the task on their own. If the student enters inaccurate information, the Self-test mode provides clues to guide the student toward the correct answer. By creating all three simulations with one recording, you create a complete solution to help the learner master the task recorded and demonstrate their ability to repeat it back on the job.

The screenshot below shows a sample application running in the RWD Info Pak Simulator with a step-by-step tutorial on the right-hand side.



Used by permission, RWD Technologies®

DDI's OPAL™ (Online Performance and Learning)

(Used by permission, Development Dimensions International, Inc.)

An Overview of OPAL™

OPAL™, from Development Dimensions International, Inc. (commonly known as DDI), is an innovative online competency development system and day-to-day job performance improvement tool. OPAL presents the tools that employees need to build skills and perform better on the job—such as insightful information, action planners, assessments, worksheets, performance tools, and more—on a clear, intuitive interface right at their PCs via their intranet or the Internet. Using OPAL™, employees can

- Receive just-in-time coaching for handling tough job situations.
- Learn and develop important business competencies.
- Access online activities, tools, and job aids that provide hands-on learning.
- Perform competency-based self-assessments and send assessments to others.

Customization

To meet the ever-changing needs of your organization, a client or DDI can customize OPAL™ content, and individual users may customize their own OPAL™ home page and choose their preferences with the “My OPAL” feature. Typically, however, the OPAL system stores practical information about common leadership and management activities, and it can be customized with company-specific job aids and short tips for dealing with difficult situations. The system is also fully searchable and can be used as a knowledge repository for “practical wisdom” on leading KM practices. Thus, OPAL demonstrates that there is sometimes little difference between a system that is built to maximize performance, and a system that is built for creating, managing, and delivering knowledge, while the integration of

knowledge-based content objects for use throughout the enterprise is a core function that can be enabled through a technology such as OPAL.

In part, OPAL provides a “fix” for a common problem: Organizations are leaner than ever, with fewer people performing the same amount of work, so learning often becomes impossible to fit into the heavy workloads that many of these employees are carrying. DDI’s solution to this ongoing dilemma is online learning, where employees obtain the skills they need on a schedule that best fits their workload. This computer-based personal enhancement system, which originates from an organization’s own intranet or the Internet, can supplement classroom training, provide coaching, and serve as an individual’s personal development program.

Advantages



OPAL™ system will help you

- Improve employee performance.
- Drive career, succession, and individual development planning.
- Ensure the competence of your work force to meet business requirements.
- Encourage employees to take responsibility for their own employability.
- Do more with less.
- Reach employees in remote locations.
- Leverage your training and development investment.
- Assess your corporate developmental needs with 360-degree feedback.

Organizations spend hundreds of thousands of dollars on computers and intranet and Internet technology. But do they effectively leverage that investment to improve employee performance? OPAL™ is the first comprehensive enhancement system developed specifically for intranet and Internet use. It provides day-to-day job performance and professional development learning via the user's personal computer for access anytime, anywhere.

Performance Objectives

OPAL helps associates

- Receive just-in-time coaching and expert guidance on handling work situations.
- Learn and develop important business competencies.
- Access online skill-building exercises that provide hands-on learning.
- Perform self-assessments and multirater feedback surveys.

System Overview

OPAL includes hundreds of job aids, including action planners, surveys, interview worksheets, and discussion guides. The system also features a multirater feedback component, an individual development plan, multimedia enhancements, discussion areas, and a comprehensive competency library. OPAL also allows learners to set preferences with the “My OPAL” feature.

OPAL consists of three components: Advisor: Your Personal Resource for Handling Tough Work Situations; Developer: Your Online Mentor for Professional Development; and Assessor: Your Online Skills Assessment Tool.

Component Overview

Advisor: This component provides a range of just-in-time learning resources for handling tough work situations. It includes practical tips and guidelines, 232 learning tools, and 164 topics separated into 13 groups. These topic groups are change, collaborating, coaching, conflict, core interpersonal skills, customer service, delegating, interviewing, meetings, performance management, productivity, stress management, and teams. In the optional multimedia edition of OPAL Advisor, video and audio clips are provided for a more dynamic learning environment. (The multimedia content is optional to accommodate organizations that cannot stream video or audio across their intranets due to bandwidth limitations or policies.)



Used by permission of Development Dimensions International, Inc.

Developer: Developer helps employees hone their skills in any of 39 competencies from DDI's High-Performance library. These include adaptability, building trust, coaching, decision making, innovation, and planning and organizing. To reinforce knowledge and transfer it to the job, Developer also offers 345 skill-building exercises.

Assessor: This component gives employees the ability to create flexible assessment surveys that reveal strengths and development needs. Employees can create tailored surveys to solicit feedback from others in their organization. Teams, division, or departments can create standard surveys to assess the organizational needs. OPAL sends out the survey, logs who has or has not responded, and creates easy-to-read reports of the results. The results help employees focus on job competencies that need the most development.

Primary Competencies Developed

OPAL supports 39 competencies from DDI's High-Performance Library and can be customized to each organization's need.

Results

East Kentucky Power Corporation selected OPAL as an organization-wide development tool because the company wanted employees to pursue and be responsible for their own personal and career development. A survey of the firm's OPAL users revealed 23 percent improvement in their use of teamwork skills, a 20 percent average improvement in their use of customer service skills, and a 14 percent average improvement in communication behaviors. Eighty-seven percent of survey participants said they would recommend OPAL to their colleagues.

http://www.ddiworld.com/leadership/opal_components.asp

Cisco AVVID—The Architecture for e-Business

Executive Summary

Cisco AVVID (Architecture for Voice, Video and Integrated Data) defines a framework for building and evolving customer networks that support Internet business solutions. The industry's only enterprise-wide, standards-based network architecture, Cisco AVVID provides a roadmap for combining business and technology strategies into one cohesive model. Cisco AVVID describes network elements for clients (devices with which users access the network), the network infrastructure (network platforms and intelligent network services), Internet middleware (software and tools), Internet business integrator interaction, and Internet business solutions.

Cisco AVVID comprises a consistent approach and set of best practices that provide a reliable foundation on which to build demanding Internet business solutions. Enterprises that build end-to-end Cisco AVVID infrastructures are highly agile

and adaptable, responding easily to threats and opportunities as business practices are reengineered. While still embracing standards, openness, and the concept of multivendor ecosystems, Cisco AVVID provides added value in end-to-end networking services that help enterprises meet the needs of a rapidly changing environment.

Background

The goal of Cisco AVVID is to provide a roadmap for enterprise customers to use as they design and implement networks. In the past, networking vendors typically offered similar enterprise network architectures that were, almost without exception, proprietary, closed, and hierarchical. A typical example is IBM Systems Network Architecture (SNA), which dictated all enterprise customer choices from computing platforms to networking protocols and terminal devices. Even though vendors such as IBM ensured a level of interworking and reliability by controlling all aspects of the system, innovation was limited and costs remained high because the large amount of proprietary equipment in the system posed challenges for potential competitors in engineering to a closed standard architecture.

By contrast, today's data networks have evolved based on open standards such as TCP/IP, UNIX, Ethernet, and de facto standards such as Microsoft Windows. These data network technologies are often described as client/server-based. The open nature of these networks speeds innovation and decreases cost to end users through competition. In many cases, even de facto standards such as Microsoft Windows have well-documented application programming interfaces (APIs) to allow interaction between devices and applications.

As client/server networking has grown, the requirements of enterprises have also evolved. Applying technology to business practices—such as sales, support, customer response management, accounting, and supply chain—has brought tremendous benefits in increased efficiency and lower costs. Many of these

new technologies support entirely different business models (for example, business-to-consumer e-commerce, business-to-business online exchanges, and so forth). In other cases, the new technologies have been used to reengineer existing business practices. In all cases, the need for reliability, performance, and ease of deployment and management remains crucial because these applications have become more critical to the success of enterprises (whether profit-making or service-oriented). With the growth of the Internet, these emerging business applications and practices have been termed Internet business solutions. Whether accessed by the global Internet or an enterprise-wide intranet, the basic technologies and models of the Internet (such as TCP/IP and server-based processing) are being used. In many cases, user access to these solutions comes over the global Internet or through Internet-based technology such as browsers. A major need for the enterprise, then, is to use the inherently open and innovative technology of the Internet to meet demanding business requirements.

Because enterprises have embraced open client/server and web-based computer models, they face the challenge of creating well-designed network architectures. In many cases, the temptation to build networks using best-of-breed (that is, individual high-performing devices from different vendors) or best-of-bid (lowest cost) logic has created problems. Although the standards were sufficient to build functional networks, Internet business solutions create demands beyond mere connectivity. While standards remain fundamental, enterprises now require solutions based on devices and applications that work well together beyond the lowest common denominator of shared technology standards.

For example, as more and different applications begin sharing the data network, the need for management, reliability, and control increases. Unlike traditional hierarchical network architectures such as SNA, the emerging network model is widely distributed so that servers anywhere in the network

provide information and processing services to users regardless of location. Adequately serving the needs of Internet business solutions in this environment requires a consistent set of network services end-to-end through the network, providing prioritization, high availability, and performance. In much the way that a level physical foundation provides the reference point and support for a complex physical building, these consistent services provide a foundation for rapid deployment and easy administration of Internet business solutions.

One of the benefits of Cisco AVVID is that it advances the state of the art in voice and video solutions. Data networks have benefited from open standards since the 1980s, yet voice and video have remained primarily proprietary solutions because of the idiosyncratic and demanding requirements of voice and video traffic (for example, the need for limited jitter and delay). Developments in processing power and networking standards now permit voice and video to be carried along with data on a single IP-based network infrastructure. While tremendous cost savings and application richness result from the convergence of voice, video, and data, the resulting demands on the network make the end-to-end capabilities of Cisco AVVID all the more important.

Benefits of an Architecture Approach

An architecture approach provides both a coherent framework that unifies disparate solutions onto a single foundation, and a roadmap for future network enhancements.

SPEED	Defined architectural framework and consistent services allow rapid deployment of new applications and enable an enterprise to quickly address change without re-engineering the network
RELIABILITY	Uptime of networks is increased due to a consistent architectural approach to network design
PACE OF CHANGE	Architecture-based network foundation decreases the time to test new solutions. Adaptation to new business requirements can take place rapidly, as needed
INTEROPERABILITY	Multiple solutions work together based on a common architectural approach
SIMPLIFICATION	Products are strategically deployed in alignment with the architectural framework, resulting in streamlined processes
COST REDUCTION	Through the use of a pre-defined architecture, resource and time requirements are minimized, reducing the cost to design and implement new networking technologies and solutions

Cisco AVVID Provides a Model and a Reference

Cisco AVVID can be viewed as a framework to describe a network that is optimized for the support of Internet business solutions and as a best practice roadmap for network implementation. This section discusses the various layers of the Cisco AVVID framework.



Used by permission of Cisco Systems

Clients

Beginning at the bottom of the diagram, clients refer to the wide variety of devices that can be used to access the Internet business solutions through the network. These might include phones, PCs, PDAs, and so forth. One key difference from traditional proprietary architectures is that the Cisco AVVID standards-based solution allows a wide variety of devices to be connected, even some not yet in broad use. Unlike traditional telephony and video solutions, proprietary access devices are not necessary. Instead, functionality is added through the intelligent network services provided in the infrastructure.

Network Platforms

The network infrastructure provides the physical and logical connection for devices, bringing them into the network. Network platforms are the LAN switches, routers, gateways, and other equipment that interconnect users and servers. Cisco network

platforms are competitive for features, performance, and price, but their key capabilities are the integration and interaction with other elements of the Cisco AVVID framework. This layer of Cisco AVVID is the foundation for all applications that will be integrated to solve business problems.

Intelligent Network Services

The intelligent network services provided through software that operates on network platforms are a major benefit of an end-to-end architecture for deploying Internet business solutions. From quality of service (QoS) (prioritization) through security, accounting, and management, intelligent network services reflect the enterprise's business rules and policies in network performance. A consistent set of the services end-to-end through the network is vital if the infrastructure is to be relied upon as a network utility. These consistent services allow new Internet business applications and e-business initiatives to roll out very quickly without a major reengineering of the network each time. By contrast, networks built on best-of-breed strategies may promise higher performance in a specific device, but cannot be counted on to deliver these sophisticated features end-to-end in a multivendor environment. Cisco AVVID supports standards to provide for migration and the incorporation of Internet business integrators, but the added intelligent network services offered by an end-to-end Cisco AVVID solution go far beyond what can be achieved in a best-of-breed environment.

Internet Middleware

The Internet middleware layer is a key part of any networking architecture, providing the software and tools to break down the barriers of complexity arising from new technology. The software and tools in this layer allow integrators and customers to tailor their network infrastructure and customize intelligent network services to meet application needs. This layer manages access, call setup and teardown, perimeter security, prioritiza-

tion and bandwidth allocation, and user privileges. Software, such as distributed customer contact suites, messaging solutions, and multimedia and collaboration provide capabilities and a communication foundation that enable interaction between users and a variety of application platforms. In a best-of-breed strategy, many of these capabilities must be individually configured or managed. In traditional proprietary schemes, vendors dictated these layers, limiting innovation and responsiveness. Rapid deployment of Internet business solutions depends on consistent service control and communication services capabilities throughout the network. These capabilities are often delivered by Cisco from servers distributed throughout the network.

The Internet middleware layer is the glue that joins the Internet technology layers of the Cisco AVVID framework with the Internet business solutions, in effect tuning the network infrastructure and intelligent network services to the needs of the Internet business solutions. In turn, the Internet business solutions are adapted for the best performance and availability on the network infrastructure by exploiting the end-to-end services available through the Cisco AVVID framework.

Internet Business Integrators

As part of the open ecosystem, it is imperative to enable partners with Cisco AVVID. Cisco realizes the crucial requirement to team with integrators, strategic partners, and customers to deliver complete Internet business solutions. Cisco AVVID offers a guide for these interactions by describing a consistent set of services and capabilities that form a basis for many types of partner relationships.

Internet Business Solutions

Enterprise customers are deploying Internet business solutions to reengineer their organizations. The applications associated with Internet business solutions, such as Oracle, Siebel, and Ariba, are not provided by Cisco, but are enabled, accelerated,

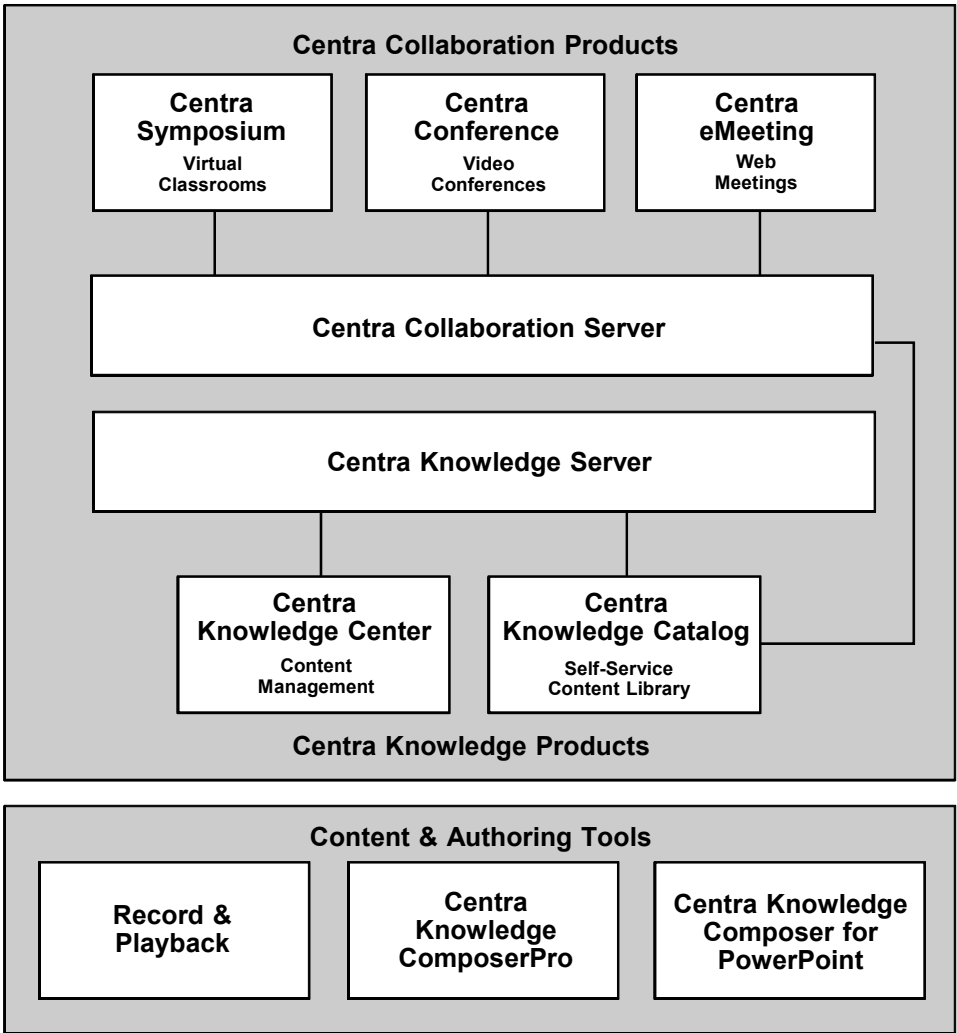
and delivered through Cisco AVVID. The ability for companies to move their traditional business models to Internet business models and to deploy Internet business solutions is key to their survival. Cisco AVVID is the architecture upon which e-businesses build Internet business solutions that can be easily deployed and managed. Ultimately, the more Internet business solutions that are delivered, the more efficiently and effectively companies will increase productivity and add value.

Centra Knowledge Center and Composer

Centra Software offers a standards-based content repository known as the Centra Knowledge Center that facilitates the capture, storage, delivery, and centralized management of custom and third-party knowledge assets. Centra's solution allows content developers to capture, manage, and disseminate the knowledge that is ubiquitous throughout an organization, whether in documents, presentations, and recordings, in a way that is fast and efficient. Through sophisticated capabilities for tagging and indexing knowledge objects within a content repository, the Centra Knowledge Server™, organizations can easily manage content selection and delivery to individual learners, negotiating a learner's skills gap and the content and activities available to meet those needs. The browser-based Centra Knowledge Center allows individuals to view personalized, assigned learning tracks and access and search a catalog of available learning resources.

By integrating Centra Knowledge Server with Centra's live and real-time collaboration products (see architecture slide on the next page), individual users can also create, lead, and attend live, interactive presentations from within the Knowledge Center interface (see screenshot on page 302) for a total blended eLearning solution. Live sessions can be captured, edited, and saved as knowledge objects within the content repository for later delivery and re-use.

CentraOne eLearning and Collaboration Platform



The screenshot shows the Centra Learner interface. At the top, there are navigation buttons for Home, My Learning, Catalog, and Profile. The user is logged in as 'Learner'. The main content area is titled 'Catalog' and contains a search box with 'XLP' entered. Below the search box, there are dropdown menus for 'SEARCH BY: Title' and 'SEARCH IN: Complete Catalog'. There are also checkboxes for 'Display fields: Author, Competency, Practice, Type, Job Role', with 'Type' checked. Below the search box, there are buttons for 'Select All', 'Clear All', and 'Add to My Learning'. The search results are displayed in a table with columns for 'Select', 'Title', 'Type', and 'Action'.

Select	Title	Type	Action
<input type="checkbox"/>	Internationalization Issues - XLP Product Release	Learning Track	Detail Review
<input type="checkbox"/>	International Team XLP Design Brainstorming Session	Symposium Event	Detail Review
<input type="checkbox"/>	LAN-based XLP Application Sharing	Conference Event	Detail Review
<input type="checkbox"/>	LAN-based XLP Design Specifications	Symposium Event	Detail Review

Personalized Learning

- Prescribed learning tracks map specific knowledge objects to learner needs
- On-demand access to a searchable catalog of knowledge assets and learning activities indexed by title, type, and category
- Supports live and self-paced content delivery formats in a single browser-based interface for effective blended learning
- Combines learning activities and assessments to track current and previous skill levels and learning track completion status
- Competency management tools enable users to conduct skills gap analysis and define learning tracks Knowledge Object Authoring
- Easy-to-use Knowledge Composers let any business user create and publish editable, standards-based knowledge objects with familiar desktop applications such as Microsoft PowerPoint

- Collaborative content authoring enables knowledge objects to be shared and re-used by multiple authors
- Create assessments, URL references, surveys, multiple choice questions, learning goals, FAQ's and threaded discussions Learning Content Management
- Content repository manages organization and delivery of proprietary knowledge assets and packaged, third-party learning content
- Publishing workflow ensures that content meets specific learning objectives
- Sophisticated knowledge object indexing and search and retrieval by name, category, and type Support for Industry Standards
- Content portability through support for SCORM specification
- AICC compliance ensures interoperability with other learning systems
- Rapid search and retrieval facilitated through IMS standard meta-data tagging
- Scalable for the Enterprise
- Web-based architecture facilitates rapid global deployment
- Centralized log-in, user management, and reporting
- Integrates with learning management systems
- Optional integration with Centra Collaboration products allows any user to create, deliver, and attend live, online events from within the Knowledge Center interface
- Integrates with Centra Collaboration Products

According to Centra, knowledge is a ubiquitous asset generated throughout an organization in documents, presentations, training programs, recordings and spontaneous conversation. Properly captured, managed, and disseminated, it can provide a powerful competitive advantage, ensuring faster time to performance and reduced content development costs. Yet

achieving this quickly and efficiently is one of the most difficult challenges facing organizations today. Centra provides a solution with the first standards-based content repository to facilitate the capture, storage, delivery, and centralized management of custom and third-party knowledge assets. With capabilities for collaborative authoring, content management, and personalized and on-demand learning programs, Centra Knowledge Products make it easy to find and re-use relevant content and training materials.

The Right Mix of Learning for Each Audience

Centra's use of standards-compliant *knowledge objects* is a new approach to accessing, organizing, and delivering learning content. Dividing material into smaller segments gives greater flexibility and precision in targeting the right mix of information and learning formats for each audience or business task.

Learners become more successful, engaged, and productive by studying only material relevant to their job or business task. Through sophisticated capabilities for tagging and indexing knowledge objects within Centra Knowledge Server™, organizations can easily manage content selection and delivery to individual learners, negotiating a learner's skills gap and the content and activities available to meet those needs. Using the browser-based Centra Knowledge Center™ interface, individuals can view assigned learning tracks, or conveniently access and search a catalog of available learning resources. The Centra Knowledge Center interface provides on-demand access to learning resources and activities, including simulations, presentations, recordings, live online events. and assessments.

Everyone is an Author, Learner, and Leader

Because all content created within an organization is a potential learning resource, Centra empowers end users to collaborate in the learning process as subject matter experts, instructors, and contributors. Through easy-to-use Knowledge Composer

wizards, any user can quickly create and publish editable, standards-compliant knowledge objects using familiar desktop applications such as Microsoft PowerPoint. By integrating Centra's live eLearning and real-time collaboration products with the Centra Knowledge Server, individual users can also create, lead, and attend live, interactive presentations from within the Centra Knowledge Center interface for a total blended learning solution. Easy-to-use recording capabilities enable users to capture, edit, and save live sessions as knowledge objects within the content repository for playback and re-use.

Knowledge Center Ensures Organizational Competency

Centra Knowledge Server provides capabilities to track and facilitate learning activities, generating management reports that summarize both individual and group activities, and provide a method to assess the growth of organizational competencies. By conducting pre-tests and offering relevant foundational materials online, learners are better prepared, allowing for a shorter, more productive learning process. Through capabilities for post-learning activity testing, organizations can track and monitor learning effectiveness against stated objectives.

A Solution for Every Business Need

Centra Knowledge Products scale to meet the needs of the largest enterprises and public Internet sites. Centra Knowledge Server uses standard relational databases, such as Microsoft SQL and Oracle, and can be easily integrated with today's leading Learning Management and Human Resource Management Systems through AICC compliance. Centra also offers the flexibility to choose the deployment plan that's right for you. Install Centra Knowledge Center on-premises for maximum security and lowest cost of ownership, or access Knowledge Center software through Centra's convenient and secure ASP. Each Centra solution ensures universal reach through firewalls and proxy servers, and delivers good performance over low-bandwidth Internet connections.

Unparalleled Customer Care

Only Centra offers a network of company and partner-led services designed to make every customer a success. These programs include industry-recognized product education, technical support, documentation and professional consulting services. Centra's proven deployment methodology ensures the rapid implementation of Centra solutions within your organization and provides a roadmap for future applications of eLearning and collaboration across the extended enterprise.

Centra Knowledge Composer™ Pro is a desktop application that enables professional content designers to organize and combine media assets with interactive learning activities and assessments.

Centra Composer™—Tools for Rapid Content Development

The screenshot displays the Centra Composer interface. On the left is a vertical toolbar with icons for Learning Tracks, Learning Objects, Assessment Items, Learning Goals and Objectives, Resources, and a Recycle Folder. The main workspace is divided into two panes. The left pane shows a hierarchical tree view of the project structure under 'CRM_Sales', including folders for Learning Tracks, Learning Objects, Assessment Items, Learning Goals and Objectives, Resources, and a Recycle Folder. The right pane displays a table of learning activities with columns for Name, Type, Description, Author, Created, and Last Modified.

Name	Type	Description	Author	Created	Last Mod.
[-] Click To Identify					
[I] In a new company entry, whic...	Click To Identify	In a new comp...	vsummer	04/06/200...	04/06/2...
[I] Click the tab that lets you revie...	Click To Identify	Click the tab th...	vsummer	04/06/200...	04/06/2...
[-] Connect The Points					
[I] Match each Pivotal icon with t...	Connect The Points	Match each Pi...	vsummer	04/06/200...	04/06/2...
[-] Drag And Drop					
[I] Study this view of the Pivotal t...	Drag And Drop	Study this view...	vsummer	04/06/200...	04/06/2...
[-] Fill In The Blank					
[I] Complete the entry below by e...	Fill In The Blank	Complete the e...	vsummer	04/06/200...	04/06/2...
[I] Complete the following statem...	Fill In The Blank	Complete the f...	vsummer	04/06/200...	04/06/2...
[-] Match The Column					
[I] Match the icon with its design...	Match The Column	Match the icon...	vsummer	04/06/200...	04/06/2...
[-] Multiple Choice					
[I] Which of these fields must be ...	Multiple Choice	Which of these...	vsummer	04/06/200...	04/06/2...
[I] True or False. Before adding ...	Multiple Choice	True or False. ...	vsummer	04/06/200...	04/06/2...
[I] If you are creating a new oppo...	Multiple Choice	If you are creati...	vsummer	04/06/200...	04/06/2...

Used by permission, Centra

Centra Knowledge authoring products empower business professionals across the organization to collaborate in the learning process as subject matter experts, teachers, and contributors. Through easy-to-use Knowledge Composer wizards, users can quickly create and publish editable, re-usable standards-compliant knowledge objects, surveys, FAQ's, and other web-based content.

Centra Knowledge Composer Pro is a set of content creation and management tools that enable instructional designers and other experts to create knowledge objects and learning tracks with rich media assets, design interactive simulations, and create engaging assessments—all without programming knowledge. Knowledge Composer Pro consists of Centra Knowledge Composer, the authoring tool that enables instructional designers to create, assemble, and organize text, video, graphics, HTML files, and other content into knowledge objects; Centra Composer for Simulation to create engaging software, product, and process simulations that include interactive features such as hot spots and hints; and web-based frame games. Knowledge Composer Pro is available as an add-on application to the Centra Knowledge Center and supports:

- Interactive presentations
- Session recordings
- Blended learning tracks
- Simulations and frame games
- Assessments and quizzes

Knowledge Composer Pro is also easy to use:

- No programming required
- Familiar Windows interface
- Pre-configured templates for adding navigation and interactivity, creating assessments and quizzes, learning tracks, activities and objectives

- Content preview capability; output in industry standard media formats Knowledge Object Authoring
- Easy-to-use Knowledge Composers let any business user create and publish editable, standards-based knowledge objects
- Collaborative content authoring enables knowledge objects to be shared and re-used by multiple authors
- Organize session recordings, surveys, simulations, FAQ's, and other web-based content into instructionally sound learning tracks Interactive Content
- Develop URL references, surveys, multiple choice questions, learning goals, FAQ's, and threaded discussions
- Simple exercise creation enhances learning experiences
- Add pre- and post-activity assessments with scoring to measure individual and organizational competencies

Knowledge Composer Pro Support for Industry Standards:

- Content portability through support for SCORM specification
- AICC compliance ensures interoperability with other learning systems
- Rapid search and retrieval facilitated through IMS standard meta-data tagging
- Session recordings available in .wmv, .rm, .avi, and Centra proprietary formats
- Content management, knowledge objects stored in online content repository for easy search and retrieval
- Compatible with Centra Knowledge Center and Centra Knowledge Catalog
- Browse indexed knowledge objects by category, title, and content type
- Automatically generates reports on knowledge object usage and user results of learning activities and assessments embedded in knowledge objects

Centra Knowledge Composer for PowerPoint Enables Business Users to Author and Publish Interactive Knowledge Objects

In today's fast-paced business environment, products, services and competitors can change rapidly. To stay on top and maximize the contributions of employees and partners toward the business goals of the enterprise, Centra provides easy-to-use software tools that transform content, knowledge, and interactions generated throughout the organization into potential learning resources. Based on the CentraOne™ web collaboration platform, Centra Knowledge Composers™ empower any business professional—from subject matter experts to advanced instructional designers—to collaborate in the learning process as content authors, contributors, and teachers. Centra's suite of compatible Knowledge Composer applications and extensions let users quickly create and publish editable, standards-compliant knowledge objects, session recordings, surveys, FAQ's, and assessments.

Standards-Compliant Knowledge Objects

Centra Knowledge Composers enhance Centra's solutions for eLearning and collaboration with powerful interactive content creation capabilities. Centra products provide unprecedented support for today's leading content standards and specifications to ensure content portability and interoperability. Through support for popular output and meta-data tagging standards such as SCORM, AICC, IMS, and Microsoft LRN, Centra enables content authors to instantly access, combine, index, and re-use knowledge objects—significantly lowering development costs.

Use Centra Knowledge Composers, including Centra Knowledge Composer™ for PowerPoint and Centra Knowledge Composer Pro™, to publish knowledge objects in the Centra environment.

Use Server™, a powerful online content repository to quickly search and retrieve knowledge objects and recordings from the content database using the Centra Knowledge Center™ or Centra Knowledge Catalog™ web interfaces, giving users self-service access to job-critical training materials and references. Centra Knowledge Server tracks learning activities and generates results reports of quizzes and assessments embedded in knowledge objects to measure organizational competency.

Create Interactive Learning Content

Using Centra Knowledge Composer™ for PowerPoint, an easy-to-use extension to Microsoft Office, any business user or subject matter expert can create rich, interactive web-ready knowledge objects using Microsoft PowerPoint 2000. A built-in wizard helps guide you through the design process, providing templates for adding assessments and quizzes with scoring and remediation, table of contents, and web-ready tool bars.

With Centra Knowledge Composer for PowerPoint, you can dramatically increase the effectiveness of new and existing presentations by adding interactivity, including audio overlays and assessments to make them more engaging and dynamic. It's the perfect solution for presentations that must be published quickly or updated frequently, such as new product presentations, corporate orientation materials, and documentation for processes and procedures. A standard feature of Centra Knowledge Center, Centra Knowledge Composer for PowerPoint can also be purchased separately for use with Centra Knowledge Catalog.

Record and Playback Live Content and Interactions

With the comprehensive recording capabilities included in Centra's live eLearning systems, anyone can create knowledge objects derived from live sessions and output them in industry-standard media formats. These recordings can be easily edited and indexed using Centra's integrated editing tools or other popular media production software and can be indexed and

stored in Centra Knowledge Server for instant playback or reused as content in future events.

Build Learning Tracks, Assessments, and Exercises

Ideal for professional content and instructional designers, Centra Knowledge Composer Pro™ provides a powerful set of content composition and resource management tools to build blended learning tracks, design interactive simulations, and create assessments. Sold as an add-on to Centra Knowledge Server, the Centra Knowledge Composer Pro package includes Centra Knowledge Composer™, Centra Knowledge Composer for Simulations™ and tools for creating and publishing interactive Frame Games.

Use Centra Knowledge Composer to quickly organize and combine multimedia assets, such as graphics, videos and recordings, Flash, and other web content into personalized learning tracks. Adding pre-tests and post-tests to learning tracks lets administrators quickly assess skills gaps. Use Centra Knowledge Composer for Simulations and Frame Games to enhance learning experiences with knowledge objects derived from simulations and other learning games in the form “Chunk Recall” and “Find Slot.”

Centra Knowledge Composer Pro is a powerful desktop application that enables professional content designers to organize and combine media assets with interactive learning activities and assessments.

Software Infrastructure for eLearning and Collaboration

Used by more than 600 companies, government agencies, and universities worldwide, Centra’s enterprise products and services are based on CentraOne™, a robust and extensible thin-client architecture for eLearning and collaboration. By leveraging the core capabilities of the web-based CentraOne platform, Centra is the only company to offer a full range of

knowledge delivery and management solutions—from voice-enabled virtual classrooms, web conferences, and online meetings to powerful products for content management, personalized eLearning, and standards-compliant authoring—all on a single platform. Through this integrated environment, organizations can increase the overall effectiveness of their eLearning initiatives, targeting the appropriate mix of live and self-paced learning formats and activities for each audience or strategic business task.

Outstart

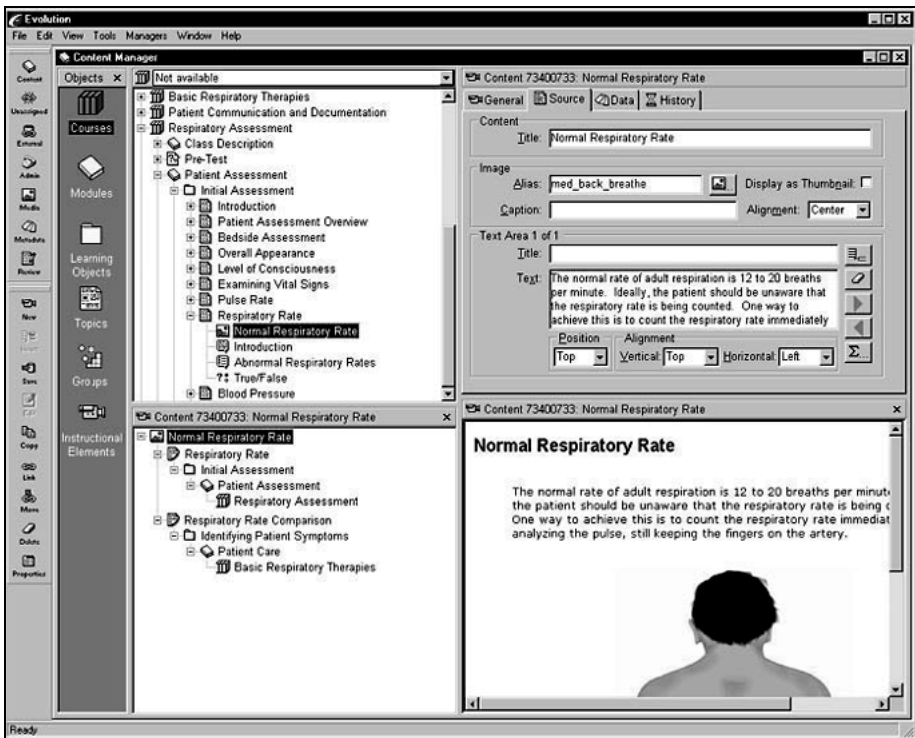
Evolution from Outstart is a state-of-the-art technological platform required for implementing a successful learning solution. It is a collaborative development and dynamic delivery environment that also has a tightly integrated learning management system. Evolution has been designed for simple and rapid creation of interactive, adaptive materials. Though this design allows for traditional development philosophies, methodologies, and delivery for course development, Evolution's strength is in its ability to deliver on the promise of reusable learning object development and individualized delivery. Evolution comprises four key components:

- Content Development
- Content Delivery
- Individualized Delivery
- eLearning Management

Evolution Developer enables rapid template-driven, object-oriented development and reuse of content. Evolution also facilitates workflow and productivity through a complete review content manager. It comprises multiple components that model and provide tools for full education content authoring, development, and object management lifecycles. Evolution supports custom template creation and provides over 30 forms for instructional elements including textual, graphical, interactive, survey,

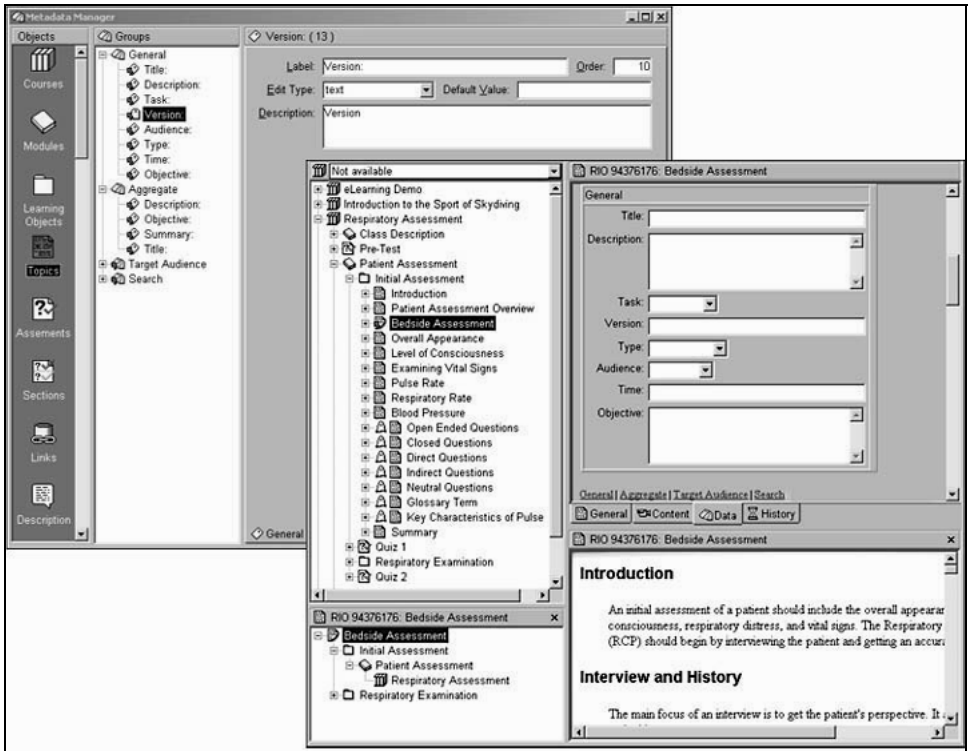
and assessment. It includes open support for multimedia, easy external and legacy content integration, SCORM import for high transportability, and an open design methodology with a customizable hierarchy.

Though Evolution's design allows for traditional development philosophies, methodologies, and delivery for course development, its strength is in its ability to support the promises of re-usable learning object development and individualized delivery.



EVOLUTION™ allows users to easily create, link and reuse content within its rapid development environment.

Used by permission, Outstart, Inc., Boston, MA



The unique metadata engine within Evolution™ provides users with a customizable system for easily locating and reusing content.

Used by permission, Outstart, Inc., Boston, MA

The screenshot displays the 'E-Learning Portal' for 'OUTSTART', with the tagline 'enabling enterprise e-learning'. The main navigation includes 'Welcome', 'Training', 'Documentation', and 'Export'. On the left, there are sections for 'Member Sign Out', 'Welcome back, Student!' with a 'Sign Out' button, and 'Personal Information'. The central 'Table of Contents' shows the selected course 'Respiratory Assessment' with a 'Find' button. Below this, a list of modules is shown with checkboxes: 'Class Description', 'Pre-Test', 'Patient Assessment', and 'Initial Assessment'. To the right, a 'Completion Last Accessed' table lists various assessment attempts with dates and times, such as '06/11/01 02:28 PM' and '06/11/01 02:53 PM'. The main content area is titled 'Respiratory Assessment Initial Assessment' and includes a '1 OF 10' indicator. A sidebar on the left lists assessment topics like 'Introduction', 'Patient Assessment Overview', 'Bedside Assessment', 'Overall Appearance', 'Level of Consciousness', 'Examining Vital Signs', 'Pulse Rate', 'Respiratory Rate', 'Blood Pressure', and 'Summary'. The main text area is titled 'Normal Respiratory Rate' and contains the text: 'The normal rate of adult respiration is 12 to 20 breaths per minute. Ideally, the patient should be unaware that the respiratory rate is being counted. One way to achieve this is to count the respiratory rate immediately after analyzing the pulse, still keeping the fingers on the artery.' Below the text is an illustration of a person's back. An inset window shows a smaller version of the same content.

Evolution™ allows for a variety of high-quality delivery options to meet the diverse needs of today's learners.

Used by permission of Outstart, Inc., Boston, MA

This page intentionally left blank

Chapter 12

eBooks for eLearning

Overview

Have you ever read an entire book online? Many people start out with a common bias that it is simply too hard to read online and perhaps that less is learned through this reading medium. This may be a fair assumption given the current technical and screen limitations, but eBooks do represent an emerging trend globally, and there is considerable potential in their relationship to blended eLearning systems.

Let's look at an example scenario. It's your first day in a university class. You walk in and examine the syllabus. In addition to the lectures and exam sessions that you'll be attending, you note that there is a textbook for the course. Is the book the course? No, but it is a supplement to the course, a valuable resource that provides foundational material that you can study at your own pace and use as needed to augment the rest of your learning experience in the classroom. Just as a physical textbook provides that supplement in a real classroom, the same can be true of eBooks in an eLearning class. But there is also great potential to have eBooks do far more than a physical textbook ever could in helping to make blended eLearning solutions even more successful.

Current State of eBooks

eBooks are currently a nascent part of the overall publishing market. With only \$251 million of the projected \$7.8 billion publishing industry over the next five years, it's little wonder that they do not get more attention (Forrester Research, *Books Unbound*, December 2000). Also, the promise of eBooks has

been, in many people's mind, "tried before" and is now beginning to gain acceptance. But all eBooks are not the same. In fact, eBooks can be categorized into several delivery formats. The three main hardware platforms for delivery are handhelds such as Pocket PC and Palm, specialized eReading devices (such as the Gemstar and Franklin eBook readers), and computer-based eBook readers that are commonly found on laptops or desktops. As might be expected, each of these platforms has its own set of characteristics, features, and limitations, though all are capable of supporting a blended eLearning model.

It's also important to point out that we're in the early stages of eBook technology, where one of the biggest drawbacks to any screen-based format is still text clarity. In fact, studies have shown that it can be up to 50 percent harder on your eyes to read off of a typical screen compared to paper. Moreover, the same studies show that the average person reads 25 percent slower when reading from a computer when compared to paper. The resolution along with radiant versus reflective light characteristics are issues that affect readability as well as eyestrain. These effects are, however, being addressed through higher resolution pages online, different radiance levels, and new technologies like Microsoft ClearType that greatly improve readability.

Another aspect of current eBooks is their artificial linearity (much like paper-based books) that serves to limit some of their key hypertextual functions that could open up new doors showing some superior dynamic content features over a print-based medium. But by far, the biggest impediments are actually conceptual rather than technical or practical. For instance, "eBook" means electronic book today, but as eBook pioneers state, "eBook" could just as easily mean "experiential book," especially as one moves from one reading platform to another. Here, one of the greatest areas of promise is cross-platform portability, and the Open eBook Forum has come up with a specification based on XML that is likely to be adopted worldwide.






The Open eBook Forum and XML Standard

The Open eBook Forum (OeBF) is an international trade and standards organization. Our members consist of hardware and software companies, publishers, authors, users of electronic books, and related organizations whose common goals are to establish specifications and standards for electronic publishing. The Forum's work will foster the development of applications and products that will benefit creators of content, makers of reading systems, and most importantly, consumers.

The guiding values of the OeBF are to strive toward

- Providing a forum for the discussion of issues and technologies related to electronic books.
- Developing, publishing, and maintaining common specifications relating to electronic books and promoting the successful adoption of these specifications.
- Promoting industry-wide participation of electronic publishing through training sessions, guidelines, and demonstrations of proven technology.
- Identifying, evaluating, and recommending standards created by other bodies related to electronic books.
- Encouraging interoperable implementations of electronic book-related systems and providing a forum for resolution of interoperability issues.
- Accommodating differences in language, culture, reading and learning styles, and individual abilities.

The OeBF can be found at this URL <http://www.openebook.org/> and typically looks as follows:

Home Members Area About Us Activities Contact Membership Info Specification Supporters		
Welcome to the Open eBook Forum -- the Leading International Trade and Standards Organization for the eBook Industry		
 <p>Open eBook Forum</p> <p>Gold Sponsors</p> <p>Adobe Systems Incorporated</p>  <p>Microsoft Corporation</p>  <p>OverDrive, Inc.</p> 	<p style="text-align: center;">What's New at OeBF</p> <ul style="list-style-type: none"> • OEBPSv1.2 available for comment • eBook Features Survey Results Now Available • OEBPS-Tech: An email list for technical discussion of the Open eBook Publication Structure • 'Open an eBook' Campaign 	<p>Quick Links</p> <ul style="list-style-type: none"> • What is the Open eBook Forum? Who is involved? • What have we achieved? Become a member • What Working Groups exist? Submit a Requirement • Contact Us • Calendar of Events
<p>OeBF Featured Member*</p>  <p>OverDrive <i>Leading the World of eBooks</i></p> <p>OverDrive, Inc. is a leading provider of end-to-end solutions for the secure publishing and distribution of eBooks and digital media through the Internet. In partnership with Microsoft Corporation and Adobe Systems, Inc., OverDrive deploys best-of-breed digital rights management (DRM) technologies within our extensive suite of eCommerce products and services.</p> <p>We developed and operate Content Reserve – the #1 digital media clearinghouse with thousands of premium titles from over 400 publishers representing 36 countries, 23 currencies and 13 languages. OverDrive has also established strategic partnerships with hundreds of leading publishers in the academic, education and trade space including HarperCollins, St. Martin's Press, Random House, Scholastic and Time Warner. As a Principal Member of the Open eBook Forum (OeBF), OverDrive is strategically focused on driving specifications and standards for the emerging and rapidly growing electronic publishing industry.</p>		
<p>Member News</p> <p>Members may submit their press releases to OeBF staff for listing.</p> <ul style="list-style-type: none"> • Data Conversion Laboratory Provides Web Access To New XML 	<p>Upcoming Events</p> <hr/> <p>OeBF Working Groups, Special Interest Groups, and Committees</p> <p>Descriptions and Contact Information</p> <p>Links to Member pages</p> <ul style="list-style-type: none"> • Accessibility SIG • eBook Industry SIG • Europe, Middle East, and Africa SIG • Metadata and Identifiers WG • Publication Structure WG • Requirements WG • Rights and Rules WG • Systems WG 	

Used by permission, Open eBook Forum

In light of these current trends and the greater acceptance of eBooks, it makes sense to look at their application to eLearning to see what is currently possible and what the future holds.

Application to eLearning

Among other uses, eBooks provide the following:

- A familiar textbook-like learning metaphor applied to electronic media
- The ability to be a cornerstone of both classroom-based learning and eLearning
- A built-in eCommerce model known as “print on demand” with built-in security model (such as PDF Merchant, and MS Reader)
- Variable pricing models based on volume (such as those offered by Book24x7.com, HRD Press, etc.)

- Instantaneous worldwide distribution through established book-seller channels
- Protection of digital copyright through Digital Rights Management technologies
- Portability across many devices through Microsoft Reader and Adobe Acrobat across all platforms, including handhelds (Pocket PC, Palm, Linux)
- Diverse authoring tools, such as Acrobat Distiller and ReaderWorks
- The ease of creating “audible books” and eBooks that meet Section 508 compliance

Future Innovations in eBooks

Integration of hypermedia and web access extend to eBooks. The “e” in eBooks will go from meaning “electronic” to meaning “experiential” with rich media integrated to form something better than books and continuously up-to-date (i.e., the subscription model), such as:

- Formation of communities around cornerstone “books” that provide a point of departure for ongoing exploration and new findings
- Forums, discussion board, chats, and live sessions
- Subscription for ongoing upgrades
- APPower format for Automatic updates to a book, ability to join and create communities, context sensitive pre-screened searches*

*Merrill R. Chapman’s *“The Product Marketing Handbook for Software,”*
Aegis-resources.com

Effect on eLearning

Linking to courses the same way a text could drive curriculum format, structure, and flow, the eLearning “course” becomes a virtual online workbook supporting the eBook (and vice-versa). Easily associate texts with courses and make them searchable for easy reference. Establish a codified system for tracking eBooks based on RDF or LOM format so that eBooks can be searched and referenced online on a macro scale (such as Think, the Library of Congress online, full-text index).

The Cosmic Library, Much Like the Cosmic Jukebox

The web gives us the Cosmic Library, but much like the Wild West, eBooks will give us a revenue model and security/encryption technologies so that authors and educators can continue to make a living and bring order to the chaos.

A Familiar Economic Enabler











Blending experience books and rich media online courses is yet another element that can be blended into a well-rounded learning solution that can include discussion forums, chat, and updates.

eBook Examples

Books24x7 Information

Books24x7, a SkillSoft Company, is a provider of web-based digital technical and business reference content, containing 1700+ digitized “best-in-class” reference books, journals, research reports, and documentation. Books24x7s hosted web-based platform enables users to search, browse, read, and collaborate with vast professional “Referenceware” libraries assembled through its relationships with more than 65 of the world’s top IT and business publishers. This includes, in the technical publishing arena, imprints like Macmillan Computer Publishing, O’Reilly, Osborne/McGraw Hill, Que, Sams, and

Sybex. In the business field, prominent publishing partners include AMACOM, ASTD Press, Berrett-Koehler, Harvard Business School Publishing, John Wiley, MIT Press, Oxford University Press, HRD Press, and others. Prominent customers that have adopted Books24x7 solutions include Bank of America, Lockheed-Martin, and Hewlett-Packard.

Find Books My Bookshelf Home Login Account Info ? Help		
<p>Find Books About ITPro About Referenceware Buy a Subscription! Free Trial Books24x7 Information</p> <p>SkillsSoft <small>Books24x7, a SkillsSoft company</small></p> <p>Recently Added Titles</p> <p> Principles of Data Mining by David Hand, Heikki Mannila and Padhraic Smyth (July 23)</p> <p> Mike Meyers' Network+ Certification Passport by Mike Meyers and Nigel Kendrick (July 23)</p> <p> Java Programming for the Absolute Beginner by Joseph P. Russell (July 23)</p> <p>More...</p> <p>Premium Content From:</p> <p> Hentzenwerts</p> <p> CAMBRIDGE UNIVERSITY PRESS</p> <p> AMACOM Books</p> <p> Visibooks</p>	<p>books24x7 Referenceware™ For Professionals</p>  <p>ITPro</p> <p>Welcome to ITPro, the web's most authoritative reference resource for technology professionals!</p> <p>Referenceware™ is a web-based interactive family of products that offers individualized and immediate access to the full content of books and reports that are critical to today's technology.</p> <p>Find books now or learn more!</p> <hr/> <p>Announcements July 23, 2002. Books24x7 Introduces ReferencePoints, White</p>	<p>LAST WEEK'S HOTTEST BOOK:</p> <p> Oracle Internals: Tips, Tricks, and Techniques for DBAs</p> <p>More...</p> <p>What's New</p> <p>Referenceware Excellence Awards</p> <p> Hear how ITPro provides great learning and productivity benefits! <small>(Requires RealPlayer)</small></p> <p>Strategic Partners</p> <p>Integrated Partners & Resellers</p> <p>Hosted Platform Partners</p> <p>Publishing Partners</p> <p>What People Are Saying</p> <p>Customers</p> <p>Avanade: Cost and Time-Efficient</p> <p>Razorfish: Trusted Information in Internet Time</p> <p>Floor: Worldwide Access More</p> <p>More...</p>

Used by permission of SkillSoft, Books 24x7

Books24x7 Referenceware™

About Referenceware™

Referenceware™ is a web-based interactive family of products that significantly improves professional performance and growth, and enhances eLearning and web-based training initiatives. Referenceware provides ready-access to critical business, technical, and skills development content in an individualized and collaborative environment.

ITPro

Provides content critical to today's technology. Whether looking for an immediate answer to a problem or brushing up on new technology, ITPro covers the wide spectrum of technology topics such as enterprise computing, networking, web applications, programming, and much more.

BusinessPro

Provides authoritative content to help corporate managers, supervisors, team leaders, financial staff, and other decision-makers build and strengthen business and personal skills and broaden their understanding of practices. BusinessPro covers such topics as leadership, communication, coaching, time management, finance and accounting, recruiting, training, and many more.

OfficeEssentials

Offers non-technical users a self-paced learning tool, which provides instruction for and immediate answers to questions about common applications found on the corporate desktop.

eBooks.com

eBooks.com was founded in January 1997 by Stephen Cole, a lifetime bibliophile. The commercial launch of the site was successfully completed in September 2000.

eBooks.com is an Australian company with a global focus. We are building an exciting range of business books from specialist and general publishers. At the same time, we are developing our inventory in other key topic areas including travel, general reference, computing, and popular fiction.

eBooks.com aims to be the pre-eminent eBookstore on the Internet, selling whole books, chapters, and pages of books online from the world's leading publishers. eBooks can be purchased and downloaded immediately by customers anywhere in the world at prices that are cheaper than printed books, with no postal charges and no waiting for delivery.

The screenshot shows the eBooks.com website interface. At the top, the logo "eBooks.com the digital bookstore" is on the left, and "eBook engine" is on the right. A navigation bar includes links for Home, Power Search, Members Area Log In, Shopping Cart, Contact Information, and Help. The date "Tuesday, July 23 2002" is displayed on the right.

Title Search

 OR
 Try our [Power Search](#)

Subjects

- ** 2002 Bestsellers **
- 2001 Bestsellers
- Antiques & Collectibles
- Architecture
- Art
- Biography & Autobiography
- Body Mind & Spirit
- Business & Economics
- Children's & Young Adult Fiction
- Computers
- Crafts & Hobbies
- Current Events
- Drama
- Education
- Family & Relationships
- Fiction
- Food and Wine
- Foreign Language Books
- Foreign Language Study
- Games

Download an eBook today

Welcome to the best range of published ebooks on the web. You can [search](#) for and view the contents of our ebooks in just a few seconds. Feel free to browse thousands of ebooks in over 50 categories.

Use it or lose it
 Intelligence and creativity are not predetermined. Your mind thrives on use. It can be developed through exercise, just like a muscle. And we have just the books to show you how. Get the most out of your mind with our fantastic **brainpower bestsellers**. Boost your memory, be creative and organize your thinking.
 For \$3.95 you can solve any problem. Or why not do *The Memory Program* for just \$15.95.

Our best seller this week? **The Procrastinator's Handbook** (\$5.00). This book just keeps on selling! Thousands of readers have taken control of their lives with this indispensable handbook.

Featured Titles

Good Health on the Go!
 By Nicc-Oszywa, Anna
 Published By: Allen & Unwin

This handy, easy-to-use manual informs, entertains and allows you to set your own goals for better health through better nutrition. Including the latest scientific research but written in a simple, practical way, *Good Health on the Go!* avoids statistics and technical jargon and emphasises practical examples. Divided into eight sections, you're guided through specific areas of nutrition such as the basics, diet as the source of energy, tuning up your immune system, reducing the effects of stress and social influences on eating habits.

eBooks.com Price: \$7.85 [Preview](#) [More...](#)

Best Sellers

1. The Procrastinator's Handbook: Mastering the Art of Doing it Now
2. 30 Minutes ... To Boost Your Communication Skills
3. The Multi-Orgasmic Couple: Sexual Secrets Every Couple Should Know
4. Codebreaker
5. Effective Executive's Guide to Access 2002: The Seven Steps for Designing Building and Managing Access Databases

• A news site focused on eBooks and eBook-related technologies and devices

• First time to eBooks.com?
 How to buy an eBook

• Buy one get one free!
 Special July Promotion

• Win a Free eBook Just for Being a Sci-Fi Buff!
 O.K. So you think you know your **SCIFI**?

• New eBooks
 July's New Releases

• Itchy Feet?

Used by permission of eBooks.com

eBooks.com provides access to reliable, authorized, published content that has been through the rigorous editorial processes of traditional book publishing and then carefully transcribed into eBook format.

eBooks.com provides an additional channel to market for publishers, who now have a global eBookstore that sells their books at no risk or cost to themselves, extending the global reach and shelf lives of their titles.

We have targeted an inventory of 120,000 books covering all categories, but initially are focusing on business books and general reference works. Subsequent categories will include computing and travel books, broadening the range to encompass all of the categories commonly found in retail and campus bookstores.

At eBooks.com you can

- Buy and download a whole book.
- Buy and download part of a book.
- Buy and download a bundled collection or anthology.
- Search the eBooks database by key word, title, author, ISBN, and category.
- Browse book descriptions and indexes and see sample text.

Publisher Benefits

- A new low-price sales outlet for your books that drives up demand for your titles with no risk of returns
- A net price purchase model that preserves publishers' margins by guaranteeing a fixed price to the publisher, irrespective of an eBook's retail price
- Full recognition of your intellectual property rights and, for the first time, a means for gaining direct payment for copies of sections of books

- The ability to meet demand for English language books in parts of the world that are not easily accessible through traditional booksellers
- More impulse purchases due to the immediate delivery of books to desktop
- Books stay in print indefinitely, leveraging assets that are dormant today

Author Benefits

- Higher income due to increased impulse purchases and expanded English-language book market
- Full recognition of your intellectual property rights and, for the first time, a means for gaining direct payment for photocopying
- Direct channel to, and feedback from, your readers
- Greater and enduring access to your works, including old and small print-run books that can remain in circulation for little or no incremental cost

Digital Rights Management (DRM)

Program: *Digital Rights Management: Establishing an Infrastructure for a Digital Economy*

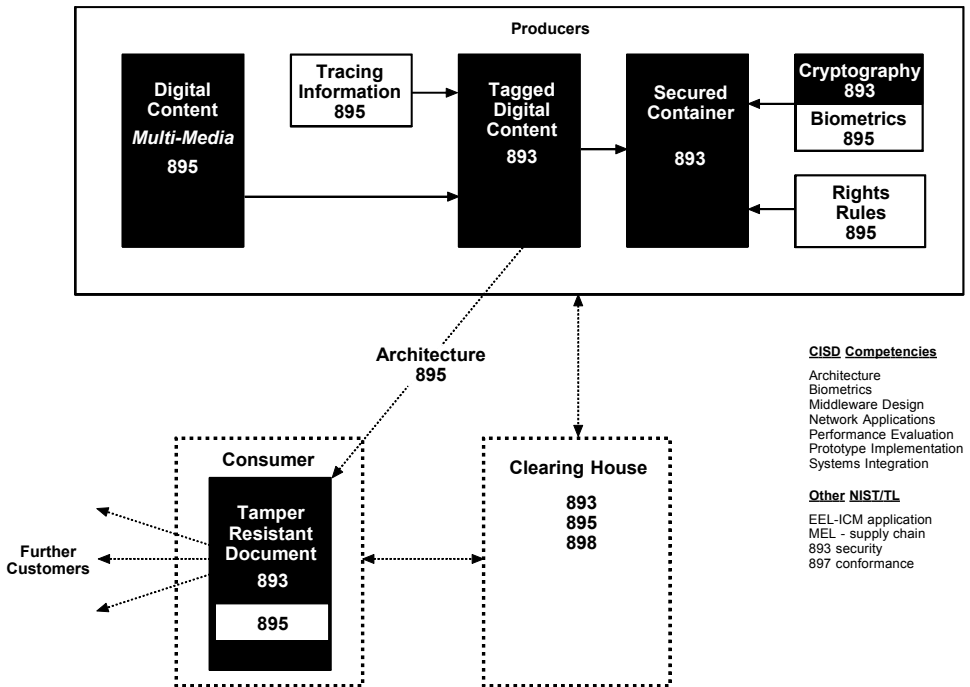
(source: National Institute of Standards and Technology, <http://www.itl.nist.gov/div895/drmmain.html>)

Critical Issue: Digital rights management (DRM) refers to technologies and services that enable legitimate owners of intellectual property to regulate the right of access to their assets via electronic means. While a digital marketplace promises to be lively, failure to protect digital content will sour things. There is a strong ambivalence about digital products and the Internet. The network provides a vibrant market for digital products; however, once stolen, digital products can be broadcast quickly to all corners of the earth. No one wants to share their bank accounts or lose their company's product design. The dis-

tribution of digital content over the Internet poses definite challenges in identity, attribution, security, convenience, trust, control, and revenue. The current state is chaotic but evolving rapidly.

Scope of DRM Technology

The light areas in the figure below show general areas of CISD focus.



Business Drivers: Electronic commerce (e-commerce) defines a broad, interdisciplinary field addressing the automation of personal or enterprise transactions via open, globally spanning, Internet public access. Internet use aims at easy interoperability to accommodate all users, no matter where they are. It also seeks high flexibility so that it can quickly host new mechanisms or other changes. The business case for Internet commerce is strong. EDI (electronic data interchange) has been limited,

inflexible, and expensive. The Internet's open standards cut costs, and industry understands this. Global-wide vendors and participants expand marketing potential, vastly widening economic vitality. The flexibility of Internet-based service fosters novel business mechanisms that have opened hitherto unrealizable avenues. New markets need the Internet's powerful aggregating of parties and populations across vast distances, and its ability to host computer automation. Business enterprises would also like to trim cycles and overheads; the Internet introduces opportunities for just-in-time planning and other abbreviated supply-chain innovations. New, value-adding stages can also be introduced to automate commerce and improve its functioning.

A counterpart to Internet transport is the purely digital product, an entity that may never manifest as a traditional physical artifact, such as a record or magazine, but instead resides solely on web-connected systems. However, a widely dispersed market and an elusive, easily duplicated product raise challenges in whom to trust. Since the Internet provides no physical presence, participants must rely upon other means to establish identity, assess reputation, and determine appropriate levels of assurance before performing services or shipping products, especially purely digital ones.

Questions of actual identity, security, assurance, risk and loss must be addressed.

With DRM, which may be a form of data encryption or system access control, comes another problem—interoperability. DRM restrictions are especially prone to generating incompatibilities, and not just obvious ones. For example, file restoration after a system crash can be impeded or even defeated by rights-protected archives. DRM interoperability (or lack thereof) is something especially noticeable in wireless communications, where numerous different devices must be addressed. With the present market immaturity, proprietary DRM solutions and intellectual property conflicts limit full potential.

CISD Response Strategy: The focus is on tasks that address fundamental standards and measurement issues. The central idea is to cut “leakage” of digital materials to minimize the effect of a leakage breach and to enforce agreements on DRM while maintaining operational economy and interoperability. Our program addresses very strong biometric identity authentication—which is increasingly needed for DRM, especially in mobile-commerce needs—to cut leakage (wrong person). It also covers architectures and protocols for trust functions: these functions address other leakage (e.g., not privileged) and digital rights recovery protocols.

More information about CISD’s role in digital rights management can be obtained through a PowerPoint presentation and white paper, both written by group manager Dr. Gordon Lyon.

The Internet Marketplace and DRM (PowerPoint presentation, in PDF format, 82.2kb)*

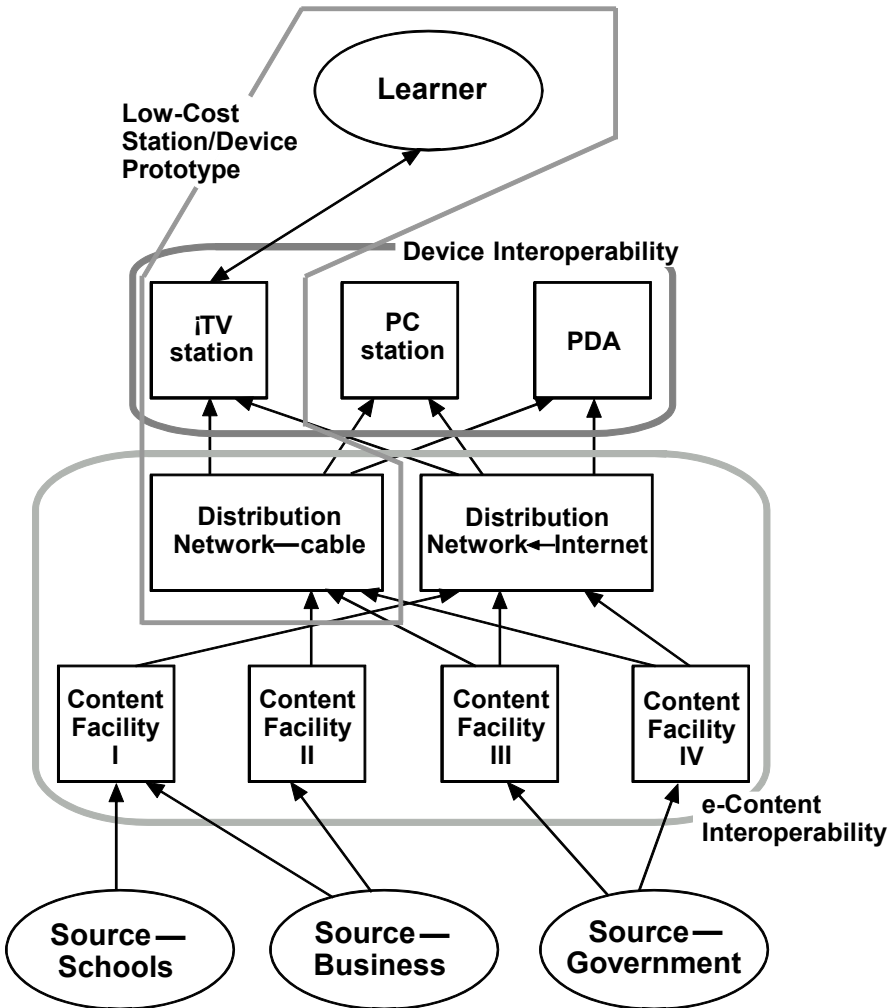
The Internet Marketplace and Digital Rights Management (Whitepaper, in PDF format, 311kb)

*Also, Forrester Research estimates that by 2003, the market for digital downloads will already be worth \$2 billion, and that by 2004, up to 25 percent of all online music sales will be downloads. Moreover, a report by eBusiness predicts that by 2003, online music piracy could cost over \$10 billion annually. (<http://www.magex.com/whymagex/thesolution/>)

Electronic Learning

Critical Issue: eLearning was recently reviewed in a report by the President’s Information Technology Advisory Committee, quoted as follows: “Inadequate technology infrastructures cause multiple problems: duplicative content development for multiple platforms, lack of interoperability among learning modules, lack of data sharing among systems, difficulty in locating existing materials, issues of unreliable quality of service, absence of a convenient way to charge for use of materials, and a disincentive to develop and publish materials a small amount at a time. The Committee saw evidence that supplying web-based templates and basic usage standards accelerated the production of materials by K12 teachers. A well-thought-out, flexible, easy-to-use infrastructure might ignite a huge amount of activity.” The figure on the next page illustrates the scope of electronic learning.

General Layout for eLearning



CISD Competencies

Distributed computing
 Network application
 Middleware
 Architecture
 Device/display technology
 Storage
 Image mapping
 Multimedia

ITL/NIST Competencies

Metadata— 897
 Security— 895
 Interfaces— 894

Business Drivers: The technical challenges for business trying to realize the potential of eLearning include

- **Architecture.** The performance requirements for eLearning must be verified for architectures and applications for different environments; e.g., content in the public domain over a low-bandwidth connection for the K12 customer space requires a different architecture than a high-bandwidth corporate application that requires content security (i.e., digital rights management). Any architecture must be flexible to allow applications to be accessed by end-users asynchronously—anytime, anywhere learning—and not confine the end-user to traditional distance learning, synchronous environments. These architectures must allow for seamless transfer of content from provider-distributor-end-user, low-latency networks for interactivity, rights management, and must maintain fidelity of content on the end-user platform.
- **Standards.** Standards are needed to ensure that the eLearning modules will be compatible with the technology used to store, distribute, and present it and will be transportable within different eLearning architectures. This includes the current specifications to support the most powerful features of eLearning media. Examples are metadata and tagging for educational content, file format for distribution (e.g., OEB, XML) presentation, storage protocols, and standards for web access and web-casting of rich media.
- **Content.** Converting traditional learning content into electronic files does not fulfill the expectation of the emerging eLearning industry. New “eLearning” content will need to be developed that provides accommodations for multimedia, human interactivity, records management, compatibility, accessibility, reusability, and digital

rights management. To take advantage of the potential of eLearning, guidelines will be needed to promote the creation of content that uses the full potential in the emerging eLearning architecture environment. Content standards examples are the use of emerging IMS and SCORM standards to promote content management, and interoperability required in eLearning systems within DoD.

- **Cost.** The education market is a huge portion of the US GDP—an estimated \$790 billion in 2000. eLearning is regarded as a way to lower the cost and raise quality for education. However, costs for startup of eLearning systems and infrastructure are still high. It is extremely important to find ways to minimize the dollar cost of eLearning.

The products and services provided by business are the ultimate enablers to the successful creation of an eLearning infrastructure. It is important to be aware of the business perspective of eLearning and to be able to consider it in terms of the business products that drive its growth. At the most basic level, the commercial products of an eLearning business are:

- **eLearning content.** This is the educational module, organized and formatted to facilitate its use in eLearning.
- **Distribution and presentation of eLearning content.** The communications (networked and/or physical distribution), the hardware and software used for distribution and presentation, and the services associated with distribution and presentation are all essential and all can generate revenue for the businesses involved.

- **eLearning management.** This includes the functions for managing a traditional institution of learning (organizing a curriculum, keeping records, administering tests, and so on), plus any new management functions that are specific to eLearning (for example, communications security).

CISD Response Strategy: We have identified critical areas where CISD knowledge, experience, and contacts can be leveraged to build the foundations for an effective eLearning program that responds to the needs of industry. The issues where CISD can have the greatest impact are architecture and content standards. These efforts will lead to lower costs for producing modules and quality of service—“authors only want to produce one module for many platforms.” Our program addresses these issues as they relate to eLearning architectures and content, driving measurements and standards to promote the growth and effectiveness of this segment of the eLearning market. (Source: NIST)

eBooks Application to eLearning— A Practical Example

To bring the actual application of eBooks into an eLearning scenario, a personal example may be appropriate. One of the graduate courses that one of the authors teaches, called Internet Management Applications, has been using an online eBook format version of Marc Abrams’s popular *World Wide Web: Beyond the Basics*. The book was first published in 1996, but has since been updated in 1998. When we first examined the book in both its more recent hardcopy format and in eBook format, we found that both were a bit outdated for the level of currency I wanted to have in the class. Either one would need to be heavily supplemented with current events, updated statistics, and recent technology innovations. Both seemed to cover the core history and necessary background information well. Also, the

hypertext links to outside resources were useful, and the chapter flow found in the electronic version was a bit better. Plus the online version was offered for free.

Interestingly, since this was the first time many students had used an eBook for a course, 75 percent of them decided to buy the paper copy anyway. The response to the eBook, even in a class about Internet technologies in practical applications, was surprising. Some students really liked the format while others were frustrated that the class was not following the flow of the paper-based book. The fact that it was a blended class with an asynchronous course web-site (half in class meetings and half in synchronous sessions) made it possible to have consistency and continuity of textbook delivery material by presenting it in class and also being able to present the actual pages online in the synchronous environment. The translation of eBooks to a displayable format online is another significant factor in determining overall usefulness. This anecdotal information leads to some interesting practices in eBook use for learning.

Conclusion

Blending eBooks with other learning interventions in the classroom and online is a best practice that can supplement the core learning experience and make key information available and searchable long-term as a performance support or knowledge application. As the issues of acceptance, prolific publication of eBooks, distribution, and security get solved, it is possible to further integrate eBooks into an eLearning solution. Further, eBooks are an example of an emerging technology that a good strategic plan for blended eLearning should address and make future provision for through open standards and flexible infrastructure design.

Chapter 13

Wireless and Mobile Applications

Overview

Wireless and handheld technology is reshaping many industries, including eLearning, and many vendors are beginning to launch new products and services to capitalize on this important trend. Demand for these mobile offerings for a pure learning function may still be slow at this point, but the potential is significant, and the initial service offerings have just begun to scratch the surface. Content vendors like Global Learning Systems, Global Knowledge, Learn2.com, and Isopia have all put out an impressive array of mini-courses for either the Palm or the PocketPC platform. And infrastructure vendors like Generation21, Isopia (now part of Sun Education), and Docent have all piloted wireless access to scheduling information, rosters, and other administrative features for training.

These two areas characterize the majority of eLearning offerings in the wireless space today. Small “courselets” and “scheduling access” represent a very logical migration to the wireless platform, but lack creativity in the application of features very unique to wireless content delivery. A variety of shifts in thinking and development must take place for us to truly unleash the power of wireless delivery for eLearning. A truly blended eLearning approach can take these devices to the next level of utility for individuals as well as organizations. Understanding how to access corporate knowledge and use the tools effectively to improve on-the-job performance could be the “killer app” for wireless and round out the currently limited courseware capabilities of these devices.

Instructional Development Shifts

To fully capitalize on the promise of wireless for learning, a fundamental shift in learning model, style, and application must occur. The shift from a training orientation to a performance support orientation is an important overall framework change. By its nature, this shift demands new learning models focused on just-in-time, just-in-place models. It is characterized by short learning segments that can be measured in seconds rather than hours. The information or exercises should be available instantly and may not follow the standard format of objective definition, content delivery, and assessment or practice. Context of need defines the objective (I must complete the task before me, that is my objective in the learning exercise, or procedure review). The assessment of learning is validated in the real world through the successful completion of the task at hand.

Is it good training? Probably not. Is it good performance support? Maybe. Can you learn and perform better through this? Yes. Is this the most efficient use of the technology based on its current features and limitations? You bet!

Technical Integration Shifts

The technical architecture also demands rethinking in order to maximize the effectiveness of the medium. Key infrastructure concerns include the integration of wireless devices into existing environments, mapping out site plans to make sure wireless will work in a typical learner environment, device selection, possible support for multiple devices, and device management issues such as synchronization, connectivity, and scalability.

User Interface Shifts

If those infrastructure issues weren't enough, you must also consider the technical side of your content distribution on small devices. Not only do you have a much smaller screen size, that size is not consistent across platforms. Neither is your color depth or text formats. To take a first pass at this dilemma,

designers should consider how much information will be on a typical screen. The jury is still out on what the optimal amount of text, graphics (if any) or combination works best. A good rule of thumb is to consider that a page of the PDA-size devices like Palm and PocketPC can have about the same amount of information on it as a 3" x 5" index card can. For smartphones, cut this into four and you have something logical.

Learner Experience Shifts

Some of the most fundamental changes that I would convey to you come from my own anecdotal experience using wireless and handheld devices to augment my learning. Note that I intentionally use the term "augment my learning" because one of the fundamental shifts in thinking is that a wireless delivery system will be good for all types of learning, in all situations. Our best examples of wireless delivery of eLearning are in conjunction with another delivery method like web-based training modules or as performance support after a live training event.

I use my handheld devices for "stolen moments of learning" so that I can eek out a little more productivity in my day by learning while standing in line at the bank or waiting for an appointment. This is the fundamental shift we should be watching. Designing for short instances of learning that are self-directed will be a norm for these new devices.

A kitchen-sink design philosophy will most certainly fail because it violates the new paradigm for instant access and short sessions that are familiar to frequent handheld device users. It also stretches the technical limits of these less robust devices, making it harder to develop. I admire developers who go with the paradigm of the device and conform to the normal user conventions. For instance, instead of trying to cram a course delivery system, class scheduling agent, and testing system into one large application, breaking these out into logical, separate components will help learners make better use of your tools.

Details of the Instructional Design Model for Wireless Performance Support

Several techniques that are well grounded in theory and research serve as guiding design principles for delivering content to handhelds. The main models for delivery of wireless learning and performance content spring from the research of Gloria Gery in Performance Support and Dan Jonassen in Constructivism.

Performance Support addresses the needs of individuals for information and instruction while on the job. One of the key functions of mobile computing is the ability to take applications with you to a remote place of work. The ability to access work instructions, real-time information, and other features are key components in reaching the promise of just-in-time, just-in-place, just-enough learning.

Usually, you would not send a totally untrained technician or salesperson out in the field alone. Some level of existing experience, knowledge, or expertise is assumed in order for an individual to be trusted to do a job. With this in mind, the idea of constructivism, which states that the learner should be given a good roadmap and the freedom to build their own path through the learning based on their needs, is the second guiding instructional theory that will help instructional designers better understand the differences in developing for this new medium, which has very distinct audience characteristics and content types. For example, a searchable database with all of the error codes for a particular device could be a powerful interface to find what you need, when you need it. While this may not be training, it is learning and is definitely a performance improvement function.

These two guiding design models manifest themselves throughout the development process as decisions about audience, use, content, and context are made. The following section highlights the decision points and processes for developing instructions.

Details of the Instructional Design Process for Wireless

In the tradition of blended eLearning, most of our projects to date have treated wireless as a branch off the core development trunk for design of a full asynchronous web-based training course. As such, the design process has been similar, but we have noted a few distinctions worth mentioning.

In each phase of a traditional Analysis, Design, Development, Implementation, and Evaluation (ADDIE) development process, there are differences worth pointing out. One area that becomes even more important is the beginning phase that is often overlooked in this model—planning. Upfront planning takes on a whole new importance when you are required to deliver learning content to different devices for different uses, in different environments or contexts. Understanding the usage can go a long way in making decisions during the other phases of development. If you know you might be delivering to a handheld or wireless device before you begin development, you can make effective decisions that cut down on redesign time and prepare the materials for multi-format delivery in advance. This allows you to work off the same base of content and reformat it with a minimum of expense. An example will give us the best grounding in reality for this abstract thought process.

Vodafone Development Example

A recent project with Vodafone called for 10 web-based training modules. Since Vodafone is the largest cellular network in the world, it made sense that they would also request that some portion of the content be deliverable over a WAP phone. Knowing that we would be asked to produce the subset of the entire course in a wireless format let us begin planning from the audience analysis phase all the way through to the implementation.

Vodafone WBT and WAP delivered course

Vodafone Has the Best International Coverage - Microsoft Internet Explorer

wireless.certification.net/vodafone

vodafone

Before Roaming Abroad (continued)

In order to use their phone whilst abroad, the customer must arrange with their Service Provider to have the roam bar lifted. Lifting the roam bar will enable the customer to receive calls whilst on another network, and to make calls to local numbers or to dial back to the UK. If the customer needs to dial any international numbers they will also need to have the international bar removed from a customer's subscription at the same time.

Usually the roaming and international bars are removed from a customer's subscription at the same time.

You have voice mail! Click the phone to get your message.

Menu Help

Turn Audio Off

Copyright RWD/Latitude360 2002

Vodafone
Has the Best
International
Coverage

Used by permission of RWD Technologies®

For the analysis phase, we were able to project the target audience and several sample use scenarios, and pilot these with both the client and several representative users to see if our assumptions were correct. The analysis also allowed us to think through some of the technical considerations facing deployment on various networks with various phone handsets and WAP devices. We were also able to figure out that the audience would be looking to the WAP content as a reminder/memory aid rather than a first exposure in most cases. The WAP content would also need to serve as a teaser to encourage people to go to the web and take the full online course if they had not already done so. The memory aid model would be useful for sales reps who need quick access to the features and benefits of the Vodafone network. A multiple level strategy would allow the learner to drill down deeper into the explanation of each benefit, but the infor-

mation will not be to nearly the depth of the web content found in the courses.

After we planned out the work and completed our analysis, it was time to design the WAP content. The hardest part of the design process is the information design in relationship to the structure of content for such a small amount of screen real estate and for limited bandwidth that is not best suited for large graphics or long blocks of text. Defining levels of information and a framework taxonomy for a large information space takes much longer than one would expect. One design principle that proves quite useful is the inverted pyramid model of writing used in newspaper stories. In this model the designer/writer provides a summary with all pertinent information and then goes into more detail in following paragraphs. These follow-on paragraphs can be structured as hyperlinks within the context of a WAP browser. Care should be taken to provide an appropriate number of choices for each page. On the web, 7+/-2 is used as a benchmark because of the typical maximum cognitive ability to remember discreet chunks of information. On the handheld device or phone handset, this number should be reduced to 4+/-2 because of the logistics of a small screen, typical number of display lines on some of the smallest handsets, and the distinct possibility that your learner is processing other information like feedback from the handset as she presses buttons to scroll through the interface. Some of the distinctions of the learners' usage patterns can be discovered during the development of preliminary WAP content templates that allow you to pour your content into a fixed, standard structure for navigating through the information. Once the information structure is designed, you can begin populating it with learning content.

During the development phase, the key factor is writing style and following through on the content structure laid out in the design phase. For example, it is necessary to write the content, or edit it for delivery on a small screen. As a development practice, we first asked our writers to put no more content on a

single screen than they could write on a quarter of a 3" x 5" notecard. This limitation helped focus the wordsmithing and made the end format apparent throughout the development process. We have since started using a database with a defined field length as a limiter. It is not enough to simply cut down the amount of text, the breaks in information must be logical and as close to lines of Reusable Learning Objects (RLOs) or Resuable Information Objects (RIOs) as possible. Following a Learning Objects model will also help you reuse some of the same content, but in a different form. After the learning content is developed and placed within the taxonomy, you are ready to put the content into the WAP information framework from the design phase.

The implementation phase includes placing the content into the technical framework, in this case WAP's Wireless Markup Language (WML). An automated process for pouring the content into the infrastructure can greatly decrease the time involved in this step, but often proves impractical for smaller amounts of content, or complex linking structures between content chunks. Another important part of the implementation process is testing. It is very important to post the content to a web server that can deliver WAP content and access it from a variety of different browsers. As in the case of web content delivered to different browsers like Netscape Navigator and Microsoft Internet Explorer, it is very likely that you will encounter anomalies related to certain phones or WAP browsers. Part of this is because of the relative newness of the technology and the variance in the WAP browser types.

After you have thoroughly tested your learning content internally, the real test comes in: rolling out the training to your intended audience. As you gather anecdotal feedback from users, it is important to evaluate these results in relationship to the overall learning program, including training in other formats and from other sources. Evaluating wireless eLearning is more difficult than other types of learning because of the instant,


rapid learning process involved when it is done correctly. Imagine asking a learner to fill out a so-called “smile sheet” or take a short test after every instant of looking up key information while on the job. The instrument would interfere with the results because of the increase in time and the annoyance factor of having to give input on a device that is known for its poorer input capabilities. One way to perform ongoing evaluations in a more structured fashion is through survey instruments delivered on the web or mail. Some organizations also conduct focus group studies to examine the usability patterns and record fixes or augmentations based on both the learning content effectiveness and the technical and interface suitability of the solution.

Case Study: 3Com® University Uses the Palm™ for Mobile eLearning

Here is a recap of the mobile solution presented in 3Com’s case study. The business of 3Com University depends on reaching internal and external sales consultants, technicians, and customers with timely information about the features, benefits, and technical specifications of its products. As an innovator in the field of personal digital assistants (PDA), 3Com was perfectly positioned to undertake a pilot project to demonstrate the usefulness of offering instant information about 3Com products to customers, consultants, and technicians who were working in the field using a Palm handheld device.

3Com University Learning Assistant

- ◆ Palm-based sales assistant tool for internal and external sales and partner network
- ◆ Office and Home Networking Solution information
- ◆ Available through 3Com University
- ◆ Rolled out globally in 2001
- ◆ Features dynamic graphics, TOC, knowledge checks



Latitude360™ a division of RWD Technologies®

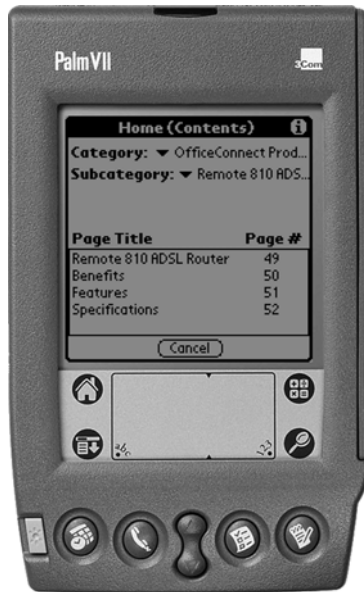
Used by permission of RWD Technologies®

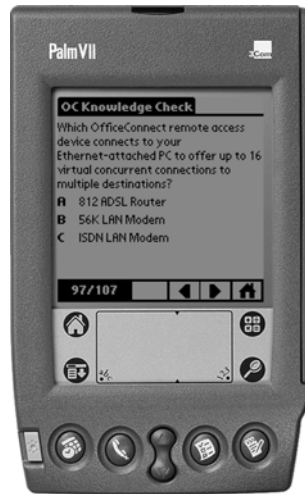
The Strategy

Latitude360™, a division of RWD Technologies®, worked with 3Com to identify a strategy that would enable the Palm to deliver just-in-time information to a mobile and geographically diverse target population. Once the technical and design strategy was in place, 3Com's HomeConnect and OfficeConnect products were selected to form the initial knowledge base. Latitude360 then developed and built two modules that contain product features, benefits, technical specifications, as well as a self-assessment where users can check their HomeConnect and OfficeConnect product knowledge. The data modules can be used with any Palm, and now anyone can download modules from the 3Com University web-site and get the latest product information instantly in the palm of his or her hand. "Being able to deliver education via the Palm, specifically in a down-loadable format, has given us a unique avenue to provide information to our students," added one 3Com manager. "They can realize the benefits of the Palm with instant on, extreme portability, and easy access to information, all without having to take 10 minutes to boot up their 12-pound laptops. It truly is training at your fingertips."

The Features

The 3Com University Learning Assistant includes important features such as easy-to-use navigation, bookmarking to save your last place in a module, and a favorites list. It also includes knowledge checks (basic multiple-choice self-assessment), advanced graphics capabilities for color and grayscale graphics, and easy-to-update and synchronizable data modules. Finding an easy-to-use tool that met the technical and design requirements was not an easy task, but a firm understanding of the development options will help make the decision process easier. Also, new products are coming out continuously and provide additional functionality.





The Solution

This solution enables 3Com University to take a lead in providing learning materials for delivery to mobile devices. The Palm delivery strategy makes it easier for people to have up-to-date information with them at all times. The Learning Assistant is easy to use. Beyond the instant availability of information, the module knowledge checks reinforce actual learning. “We expect the Learning Assistant will become a valuable tool in the hands of our sales teams around the globe,” said Geoff Roberts, director of 3Com University.

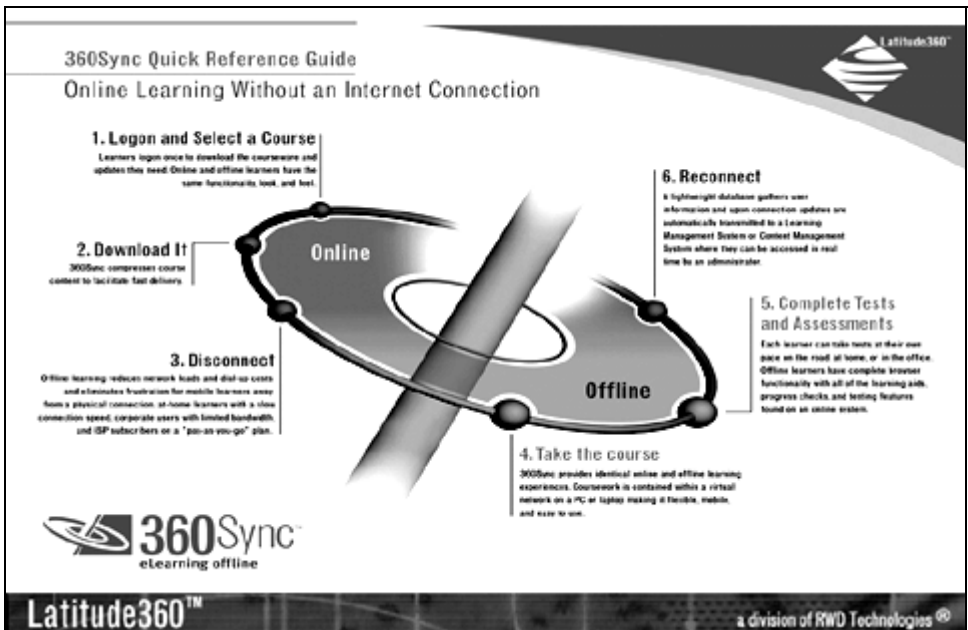
Case Study: 360Sync Offered by RWD/Latitude360

In addition to handheld-based delivery, there is a significant base of mobile learners (field sales, field services, traveling executives) who need to access learning from their laptop computer, whether online or not. **360Sync** gives learners the full range of online learning while being offline or disconnected from a network or the web. Companies invest heavily in the eLearning promise of “anywhere—anytime—24/7” training, but having eLearning content and infrastructure online is not enough for today’s mobile workforce, which may not always have fast Internet connections. eLearning that every user can access extends an organization’s return on investment and provides users with improved knowledge and skills they can apply to deliver the most business value to an organization.

Technology Features

- 100 percent Java based
- Extends function-rich eLearning to offline users
- Seamlessly delivers learning content from a network to a local host and automates synchronization upon reconnection
- Uses an HTTP-based transport protocol
- Incorporates data packet compression
- Offers revision control and automated application propagation
- Offline mode supports Servlets and JSP applications
- While offline, 360Sync tracks user behavior (via SCORM 1.1 or other proprietary systems) that logs time spent per screen or page, completion status, application navigation, and test scoring

The six-step cycle of using 360Sync is shown in the graphic below.



Used by permission, RWD Technologies®

Conclusion

Wireless eLearning is growing in importance as part of a blended learning solution. More important than the technology is how you develop your content and structure the learner experience. Design with the environment, content, learner, and technology in mind. Examine ways that you can creatively weave a wireless delivery strategy into your other training efforts. Remember that the instant learning involved with wireless is more like performance support than training and that it cannot be delivered using the same techniques as other web-delivered learning content.

Chapter 14

Resources for Blended eLearning

Industry Analysts, Research Firms, Consortia, Standards Groups, Publications, and Major Informational Web-sites

While there is no lack of information and perspectives today on blended eLearning, it is safe to say that within our model that includes OLL, EPSS, and KM, these resources are not located in any single place. Thus, we have included here a comprehensive list of industry analysts, writers, and editors who follow blended eLearning daily, and then we offer references to three important consortium-type web-sites that help define the field from the combined perspectives of OLL, EPSS, and KM. We also hope that you will frequently consult the book's web-site at www.blended-elearning.com to find up-to-date information by these industry caretakers and others.

Analysts

Clark Aldrich
eLearning Research Analyst
Emritus
Gartner Group
Clark.Aldrich@gartner.com

Howard Block, Ph.D.
Bank of America
hblock@bofasecurities.com
415-913-5771

Brandon Dobell
Bank of America
bdobell@bofasecurities.com
415-913-3697

Keith Bachman, CFA
WR Hambrecht & Co.
kbackhman@wrhambrecht.com
415-551-8600

Steven M. Lidberg, CFA
Pacific Crest
slidberg@pacific-crest.com
800-314-9837

Corrie Bergeron
Pacific Crest
cbergeron@pacific-crest.com
800-314-9837

Fred McCrea
415-364-2660

R. Keith Gay
415-364-2582

Rusty Bacon
Thomas Weisel Partners

Cushing Anderson
IDC

Michael Armstrong
ThinkEquity
415-249-2902

Bob Evans, CFA
612-677-5775

Neil Godsey
415-249-2904

Michael Moe, CFA
415-249-2901

Nathan Swanson
612-677-5755

Trace Urdan
WR Hambrecht & Co.
415-249-2907

Cornelia Weggen
ThinkEquity
415-249-2906

Training Publications/Writers/Editors

Kristin Barton
Publisher
Learning Decisions Interactive
Newsletter
Kristin@masie.com

Elliott Masie
Editor
Learning Decisions Interactive
Newsletter
Founder, Masie Center
emasie@masie.com
800-98MASIE

Brandon Hall
Editor
Technology for Learning
Lakewood Publications
Founder, Brandon-Hall.com
Brandon@brandon-hall.com
Newsletter Editorial: editor@brandon-hall.com

brandon-hall.com
690 West Fremont Ave., Suite 10
Sunnyvale, CA 94087
408-736-2335

Gene Smarte
Editor-in-Chief
e-Learning Magazine
gsmarte@elearningmag.com
714-513-8856

Elsa Schelin
Managing Editor
e-Learning Magazine
eschelin@elearningmag.com
714-513-8803

Donna J. Abernathy
Contributing Editor
ASTD Training and Development
Magazine
dabernathy@astd.org

Margeret Driscoll
Director of eLearning Strategy
IBM
Mindspan

Wendy Webb
Freelance Writer
wkwebb@bresnanlink.net

Kim Kiser
Managing Editor
Online Learning Magazine
kkiser@onlinelearningmag.com
612-340-4766

Bob Oas
Associate Editor
Online Learning Magazine
Bill Communications
612-333-0471

Philip Jones
Editorial Director
Bill Communications

Colleen Frye
Freelance Writer
cafrye@rcn.com

Susan Dittman
Deborah Koehle
Editors
ASTD Performance in Practice
800-628-2783

Training Publications/Writers/Editors

Fred Poker
Freelance Editor
e-Learning Magazine
714-513-8400

Sarah Fister
Editor
Online Learning Magazine
Bill Communications
612-333-0471

Mark Hequet
Editor
Bill Communications
mhequet@sprintmail.com
612-333-0471

Sarah Auerbach
Editor
Online Learning Magazine
Bill Communications
612-333-0471

Gloria Gery
EPSS Consultant and host of
many industry conferences
gloriagery@msn.com

Ann Barron
USF Professor

Dave Zielinski
Freelance Writer
(Training Magazine, ASTD,
Influent, etc.)
zskidoo@aol.com

Donna J. Abernathy
Contributing Editor
ASTD Training and Development
Magazine
dabernathy@astd.org

Judy Brown
EWeek/ADL Academic Co-Lab

Joe McGarvey
Interests-Network
Communications, eLearning
Infrastructure
IT Solutions for Training
Ziff Davis
josephmgarvey@ziffdavis.com
516-229-3764

Randy Barrett
Interests, news items on products,
mergers, new business lines
East Coast News Editor
barretone@patriot.net
202-785-5144

Carmen Nobel
Recent interests, Wireless
Senior Writer
EWeek (formerly PCWeek)
Carmen Nobel@ziffdavis.com
800-451-1032

Derek Rice
Interests, IT Training, Testing and
Certification
drice@supportnews.com
207-846-0600

Knowledge Management Consortium International (KMCI)

“Managing Knowledge about Knowledge Management™”

The Knowledge Management Consortium International represents organizations and individuals coming together to develop a shared vision, common understanding, and aligned action about knowledge and knowledge management. KMCI is a nonprofit organization founded in 1997 and devoted to developing a balanced view of knowledge management from the context of an organization. What we mean by balanced is to define knowledge management as part of a complex adaptive system involving people, processes, and tools. The end result of KMCI’s efforts is to provide a practical, measurable application of KM to businesses and other organizations.

KMCI Is Buyer Driven

People manage knowledge, not tools. Tools can help people manage knowledge more effectively. The majority of KMCI participants are executives, managers, or project leaders.

KMCI’s Team

KMCI’s committees, boards, and other volunteers come from all parts of the KM community from around the world. Please see who they are and contact them if you’d like.

What Is KM?

- **As a Discipline:** Knowledge management (KM) is a management discipline that focuses on improving the means by which individual and collectively held knowledge is produced and integrated in organizations. As such, KM is practiced at the level of knowledge and innovation processes, policies, and technology support. *(Mark McElroy)*

- **As a Business Process:** The Knowledge Management Process is an ongoing, persistent, purposeful network of interactions among human-based agents through which the participating agents aim at managing (handling, directing, governing, controlling, coordinating, planning, organizing) other agents, components, conditions, and activities participating in the basic knowledge life cycle processes (knowledge production and knowledge integration) to produce a planned, directed, unified whole, producing, maintaining, enhancing, acquiring, transmitting and applying the enterprise's knowledge base. (*Joe Firestone*)

<http://www.kmci.org/>

The screenshot shows the KMCI website homepage. At the top, there is a navigation menu with links: [Login](#), [Institute](#), [Resources](#), [NI Journal](#), [Events](#), [Jobs](#), [kmciPress](#), [Membership](#), [About Us](#), and [Help](#). The main heading reads "Welcome to the home of The New Knowledge Management". Below this is the KMCI logo and a "Join KMCI" button. The mission statement is: "KMCI: Helping organizations build social architectures for openness and high-performance knowledge processing!".

The "New @ KMCI" section lists several recent events:

- March 9, 2002: Yogesh Malhotra of Etrif.com Joins KMCI Board
- March 8, 2002: KMCI Co-Sponsoring "The New KM" on March 20th
- January 4, 2002: Library of Congress Chooses KMCI For "Intro To KM" Training.
- December 16, 2001: KMCI elects new board members and officers for 2002.
- November 14, 2001: KMCI announces annual Members Meeting on December 14th at MIT.
- August 16, 2001: KMCI Forms Strategic Alliance With George Washington University's Institute For Knowledge Management (IKM)
- July 26, 2001: Dr. Mark A. Nottuno appointed Director of KMCI Research Center's Basic Research Division
- July 19, 2001: KMCI Issues Statement On Certification Standards and Accreditation

The "KMCI Certification" section includes a link to "[Click here <KMCI Brochure>](#) for a brief overview of the 'KMCI Point of View' on KM and the core conceptual frameworks taught in the KMCI CKIM certification program." It details two certification programs:

- Certified Knowledge and Innovation Manager - Commercial (CKIM-C):** A business-focused program that emphasizes the importance of knowledge and innovation in the commercial sector. It is offered at three levels - CKIM-C I, II - and a variety of specialized tracks leading to Level III specialization.
- Certified Knowledge and Innovation Manager - Government (CKIM-G):** A flexible program designed to meet and exceed the US Federal government objectives for KM competencies. Its content differs by 40-50% however, in that KM metrics, IC approaches, and case study material are specifically Governmental in content.

The "KMCI Institute Endorsements" section features a quote: "I am happy to support KMCI and the superb team of instructors they have assembled for their programs in Knowledge Management. KMCI offers professionally sound content and highly qualified learning specialists that assure a quality experience. I

Used by permission, Knowledge Management Consortium International

eLearning Information (ASTD's Learning Circuits)

<http://www.learningcircuits.org/>

The screenshot shows the Learning Circuits website in a Microsoft Internet Explorer browser window. The address bar displays <http://www.learningcircuits.org/>. The page layout includes:

- Header:** ASTD logo with the tagline "Linking People, Learning & Performance" and the "Learning Circuits" title in a stylized font. Navigation links for Home, Community, ASTD, Help, Contact Us, and Search are present.
- Left Sidebar (NEWSBYTES):** A green sidebar with the date "March 30, 2002" and a list of recent news items such as "Blended Learning is Superior," "Cetra Gains a foothold in Germany," and "Video Streaming Gathers Steam in E-Learning."
- Main Content Area:**
 - ASTD 2002 International Conference & EXPO:** A red and green banner with the text "What's New What's Next What Works".
 - TOP STORIES:** A section with a "NEW!" tag for "Instruction and Feedback Models for Software Training" by Anthony Karrer, Alan Laser, and Laura Sand Martin. Other stories include "Super Synchronous SMEs: Subject Matter Experts as Synchronous Trainers" and "An Introduction to Authoring Tools".
 - EMAIL SIGN-UP:** A section titled "EMAIL SIGN-UP" with a link to "Learning Circuits Express" and a note about a free email newsletter.
 - TOOLS:** A list of tools including "Answer Geek", "E-Learning Glossary", "Face Time", "Try It!", "Web Sights", and "Webinars".
 - eREVIEWS:** A section with links for "Training Media Review Update!" and "Lguide.com".
 - ARCHIVES:** A section with links for "Learning Circuits" and "Technical Training".
 - Quick Poll:** A blue box asking "How has the slowing economy affected the development of your..."

Used by permission of ASTD

EPSS Information


EPSScentral is an outgrowth of three sites: *epss.com!*, *PCD-Innovations.com*, and EPSS Infosite, and evolved from the activities of Gloria Gery and the Performance Support Leadership Council. Special credit goes to Bill Miller, who developed EPSS Infosite, and Jaqui Seddon, who developed *epss.com!*. Gary Dickelman, who developed PCD-Innovations, recognized that while each site had its unique emphasis and value, there had been a steady dividing of mind-share and

diluting of the performance support message. Since traffic on all three sites continued to climb steadily, it made sense to focus the message and provide the best performance support resources possible. EPSScentral.com is owned and maintained by Gary J. Dickelman, one of the early proponents and practitioners of EPSS. Gary can be reached at gdickelman@pcd-innovations.com.

In addition to current information on EPSS and how it related to knowledge management, the site also offers the following:

- Opinions about technology
- Research reports
- Humor pieces and activities
- Trends in interface design
- Web applications
- Case studies
- EPSS information relating to online learning
- EPSS and mobile computing

A sample **EPSScentral** web-site page located at: *PCD-Innovations.com* can be found on the next page.




EPSS
central

Last Update
30 April 2002

What's New
[2002 PCD Awards](#)
[PCD Awards Entry Forms](#)
[Newsletter](#)
[Join the Forum](#)
[Contact EPSScentral](#)
[Job Board](#)
[PS Leadership Council](#)
[Free Downloads](#)

[e-mail this page to a friend](#)



11 September 2001
Helping.org

[About EPSScentral](#)

Lead Story **It's that time again! The 2002 Excellence in E-Learning Awards**, sponsored by brandon-hall.com and Online Learning Magazine, has arranged for EPSScentral to run the **Performance Centered Design category!** Here's your chance to show your stuff and gain recognition for yourself, your organization, your software, and/or your business sponsor... in two categories: **PCD Outcomes** (end-user/performer support solutions) and **Extraordinary PCD Tools** (for developing performance-centered systems and functions). [Read the complete story](#)

[Home](#) | [HotStuff](#) | [Samples](#) | [ForHire](#) | [HotBooks](#)

good
STUFF BROUGHT TO YOU BY **Ariel**

[Ariel Takes Top Knowledge Management Honor](#)
[The 2002 Excellence in Performance-Centered Design Awards](#)
[ISPI's Performance Express Newsletter](#)
[The Cranky User Drowning in Aqua](#)
[Usability for Senior Citizens](#)
[Losing Site of Content in a Content Management System](#)
[Performance Support Engineering Handbooks by EPSS pioneer Barry Raybould](#)

Gery Associates

EPSScentral

About EPSS & Technology

- [What Is EPSS](#)
- [Knowledge Management](#)
- [Opinions About Technology](#)
- [Research Reports](#)
- [Humor and Activities](#)
- [Trends in Interface Design](#)
- [Web Applications](#)
- [Case Studies](#)
- [Online Learning](#)

Design & Development

- [When To Use PS](#)
- [Calculating ROI](#)
- [Project Planning & Management](#)
- [Task & User Analysis](#)
- [Interface & Attributes](#)
- [Usability Evaluation](#)
- [Information Design](#)
- [Designing Web Applications](#)
- [Web Self Help & Support](#)