

And Then a Miracle Occurs! Ensuring the Successful Implementation of Enterprisewide EPSS and E-Learning from Day One

by Deborah L. Stone, CPT and Steven W. Villachica, PhD, CPT

We have all heard the horror stories about failed e-learning and electronic performance support systems (EPSS) implementation efforts that have occurred at the enterprise or organizational levels. Many companies have invested mega-bucks, time, love, and sweat in performance solutions that never got off the ground. In fact, a recent report finds that 60% of all employees offered an e-learning course actually started it (ASTD & the Masie Center, 2001) but only 20%–50% actually finished it (Frankola, nd). These disappointing rates do not include the number of courses that were developed yet never offered online. Although a lack of appropriate online instructional strategies might account for part of this dismal situation, the most important fault lies most certainly in the widespread lack of adequate e-learning implementation.

Stricken with “technolust” that emphasizes content, hardware, and software, people and companies believing that content is king often forget about the welfare of the kingdom and its citizens. Using e-learning and EPSS to push siloed content to the

masses, these companies and organizations fail to recognize the umbrella of e-options that can improve performance. They treat implementation in a narrowly defined plan as an afterthought. Following this traditional approach, they ignore the cultural and change management issues that lead to project success. Implementation success is not a miracle that may or may not occur on completion of the development phase of a given effort—it’s something that human performance technology (HPT) practitioners need to plan from Day One of a project!

EPSS and E-Learning

With the increased popularity of e-learning, web-based training, multimedia, learning management systems (LMS), and learning content management systems (LCMS), interest in EPSS, performance support, and performance-centered design has, to some extent, waned. For instance, Chapman and Hall (2001) list EPSS as one of several potential output formats of an LCMS. Other outputs include e-learning, CD-ROMs, print-based instruction, and personal digital assistants. Other definitions of e-learning appear on the World Wide Web and are summarized in Figure 1.

We argue that these narrow visions of e-learning are unnecessary, restrictive, and potentially counterproductive. We wholeheartedly agree with Rossett's "big-tent" view of e-learning, which supports learning, information support and coaching, knowledge management, interaction and collaboration, and guidance and tracking (2002). We further contend that e-learning fits within a larger framework of EPSS comprised of the elements that Gery (2002) lists: task structuring support, knowledge, data, tools, and communications and collaboration.

Seen this way, e-learning is a potential component of an EPSS that provides users "what they need, when they need it, in the form they need it so they perform in a way that consistently meets organizational objectives" (Villachica & Stone, 1999). Figure 2 depicts the potential components of an EPSS/e-learning performance solution.

Why is this vision of e-learning and EPSS important to HPT practitioners? The reason is simple. If practitioners continue to see e-learning in its more limited sense, we risk committing the same errors that our HPT founders warned us about. Tom Gilbert, Bob Mager, and Joe Harless were right! Practitioners cannot hope to solve every performance gap they encounter using training alone, or e-learning and job aids. Yet this cure-all claim seems to appear in much of the e-learning product literature, which often treats this tool as the panacea *de jour*. EPSS/e-learning, when combined with other offline interventions such as selection, standards, task support, consequences, print-based instruction, and classroom learning—offers practitioners the full range of

Definition	Source
Covers a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, and CD-ROM	Learning Circuits
Internet-enabled learning that encompasses training, education, just-in-time information, and communication	Cisco
Learning that is accomplished over the Internet, a computer network, via CD-ROM, interactive TV, or satellite broadcast	Worldwidelearn.com
Education via the Internet, network, or standalone computer. Network-enabled transfer of skills and knowledge. E-learning refers to using electronic applications and processes to learn. E-learning applications and processes include web-based learning, computer-based learning, virtual classrooms, and digital collaboration. Content is delivered via the Internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM	Learnframe.com
Broad definition of the field of using technology to deliver learning and training programs. Typically used to describe media such as CD-ROM, Internet, intranet, wireless and mobile learning. Some include knowledge management as a form of e-learning.	elearningguru.com

Figure 1. E-learning Definitions and Sources.

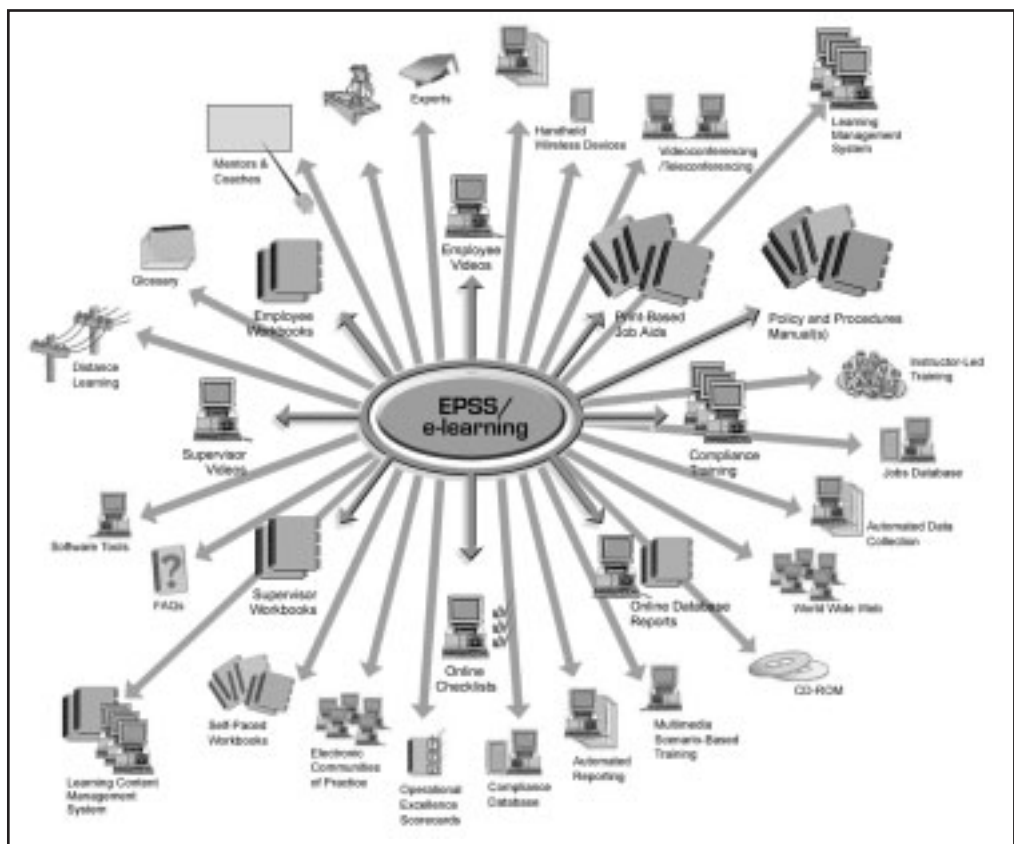


Figure 2. Potential Components of an EPSS/E-Learning Solution.

HPT for use in improving human and organizational performance.

Whether EPSS, e-learning, or e-performance, effective, enterprisewide performance solutions are:

- seamlessly integrated across the different organizations and the processes and tools that form the work people perform on the job
- systematically constructed as systems that support user performance
- comprised of multiple performance interventions designed to work together within a single, hybridized solution

The first rule of successful implementation is: Adopt a big-tent approach that can address enterprisewide performance gaps.

Aligning EPSS/E-Learning Implementation

This big-picture vision is important because HPT practitioners ideally create EPSS/e-learning and other interventions as part of performance solutions that help companies obtain measurable results. As depicted in Figure 3, companies exist in larger competitive environments that shape their business drivers: what a given company plans to do to respond to its environment. To respond to these drivers, companies formulate business objectives to obtain measurable results. To represent these objectives in their human terms, HPT practitioners identify gaps between actual and desired performances. To specify the standards associated with the desired performances that meet business objectives, practitioners specify performance requirements. Taken together, business objectives, desired performances, and performance requirements all work together to obtain measurable results.

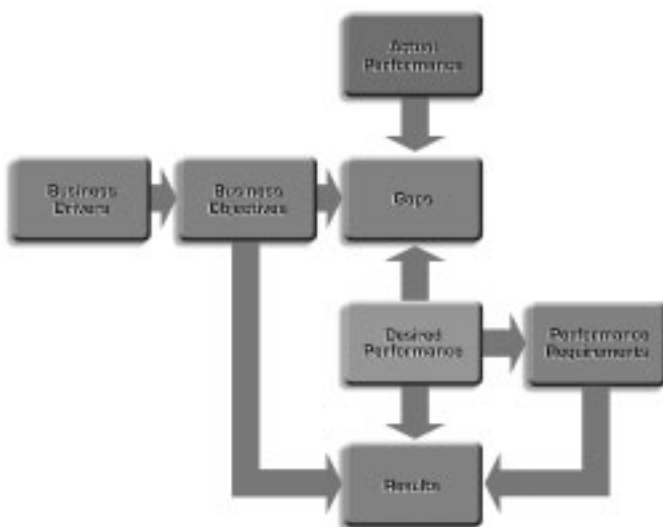


Figure 3. Alignment Factors Affecting Successful EPSS/E-learning Implementation.

HPT practitioners know that EPSS/e-learning that is not aligned with business objectives and targeted to close performance gaps in measurable ways will ultimately fail. Why? End users, managers, and executives quickly realize that any non-aligned EPSS/e-learning solution is irrelevant and unlikely to have any impact on the company or its business objectives. Given the existing business climate, these individuals are more savvy and do not want to repeat the mistakes of the past. They will avoid using any such EPSS/e-learning solution. The second rule of successful EPSS/e-learning implementation is: Align thy efforts with the company's business objectives to produce measurable results.

Change Management = Time, Buy-In, and EPSS/E-Learning Readiness

Because organizations' business drivers, business objectives, and performance requirements typically involve performance gaps that travel in packs, enterprisewide EPSS/e-learning can represent a large change. This change management effort lies at the heart of successful implementation. In the past, companies viewed implementation largely in technological terms. Successful software rollouts occurred when the companies possessed the computing infrastructure and bandwidth necessary to deliver the application software to users' workstations, along with any supporting EPSS/e-learning, classroom instruction, and documentation.

This traditional view of change management is relatively simple in scope. All necessary expertise, as well as the hardware and software, are readily available from a variety of qualified sources. The primary implementation issues are well known and logistical. Waiting for implementation to happen until the development effort has been completed harkens to a "if you build it, they will come" mentality. This approach is a recipe for disaster for enterprisewide EPSS/e-learning solutions.

HPT practitioners bundling EPSS/e-learning and other interventions into integrated performance solutions require a more sophisticated form of change management. By their very nature, these efforts are more complex. They cut across organizational silos to obtain the greatest measurable impact on the company. Such efforts require greater change on the parts of the people and organizations that make up the enterprise. As Gery (1987) notes in her book on computer-based training (CBT), technology-based solutions change the very work people perform and the roles they play in their organizations. EPSS/e-learning solutions can change the nature of their jobs, how they perform them, and the consequences of their performance. As enterprisewide EPSS/e-learning represents one of the larger changes that users may encounter during their job tenure, this type of change can be particularly threatening. Users can be expected to resist, or even sabotage, what they fear.

People naturally tend to resist change and will not change until it is less painful to change than to keep operating under the status quo (Conners, 1992). To support this contention, consider the story of a survivor of a fire on an oil derrick who saved himself by jumping several stories into the oil- and flame-filled sea. He believed that jumping was the only viable choice at the time. The potential consequences of jumping were less painful than the known consequences of staying on the derrick. Makers of mainframe computers once exhibited a similar response, refusing to support client-server and Internet architectures until the lean economic times and unhappy customers force them to do so. Successful enterprisewide EPSS/e-learning implementation efforts require conscientious change management efforts that begin on Day One of the project. Such efforts provide people across the enterprise with the time they need to change. They allow people to buy into the change. And these efforts are predicated on the creation of an enterprisewide culture of EPSS/e-learning readiness.

Time Requirements

Personal and organizational change requires time. As depicted in Figure 4, a variety of change management models indicate that change occurs over time. Examples include: a) Rogers' (1995) diffusion of innovations model that depicts the types and numbers of people who will adopt a new innovation over time, b) the Internet Time Group's marketing process (Dublin & Cross, 2002) that specifies the actions that implementers of e-learning should expedite over time and places them in a larger context of the organization's culture, infrastructure, resources, and demographics, c) the levels of use associated with Hall and Hord's (1987) concerns-based adoption model, and d) Jaffe and Scott's (1995) organizational transition model that depicts people's movement from denial to commitment, from resistance to exploration over time. Stated simply, people require time to accept new products, adopt new innovations, address their concerns about them, and commit to the change. Afterthought implementation efforts fail because they never provide such time, let alone the complex planning it entails as people assume new jobs and roles within the organization. In addition to alignment with business objectives, another mechanism for ensuring successful EPSS/e-learning implementation lies in jump-starting the change management process on Day One to allow users and stakeholders across the enterprise adequate time to change.

Buy-In Requirements

Successful implementation also requires that people willingly accept their changed jobs and roles within the organization. People usually fail to buy into changes they feel have been arbitrarily or capriciously mandated. However, they will often accept changes that they have had a hand in making. This means that users, supervisors and managers, and

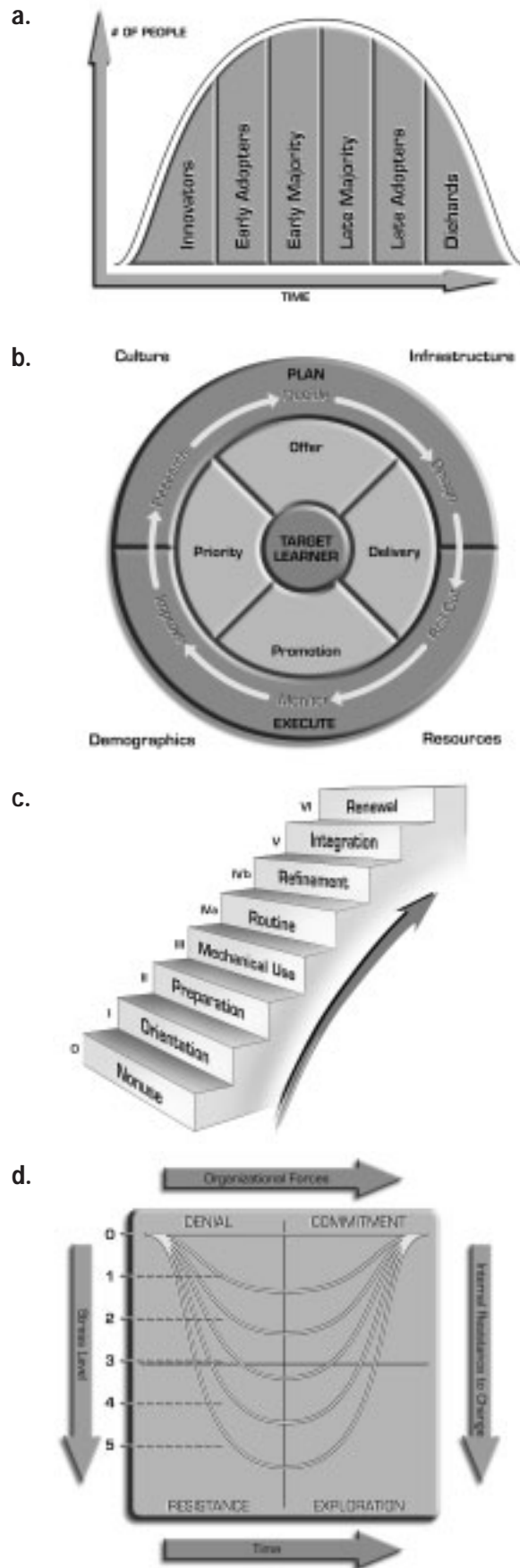
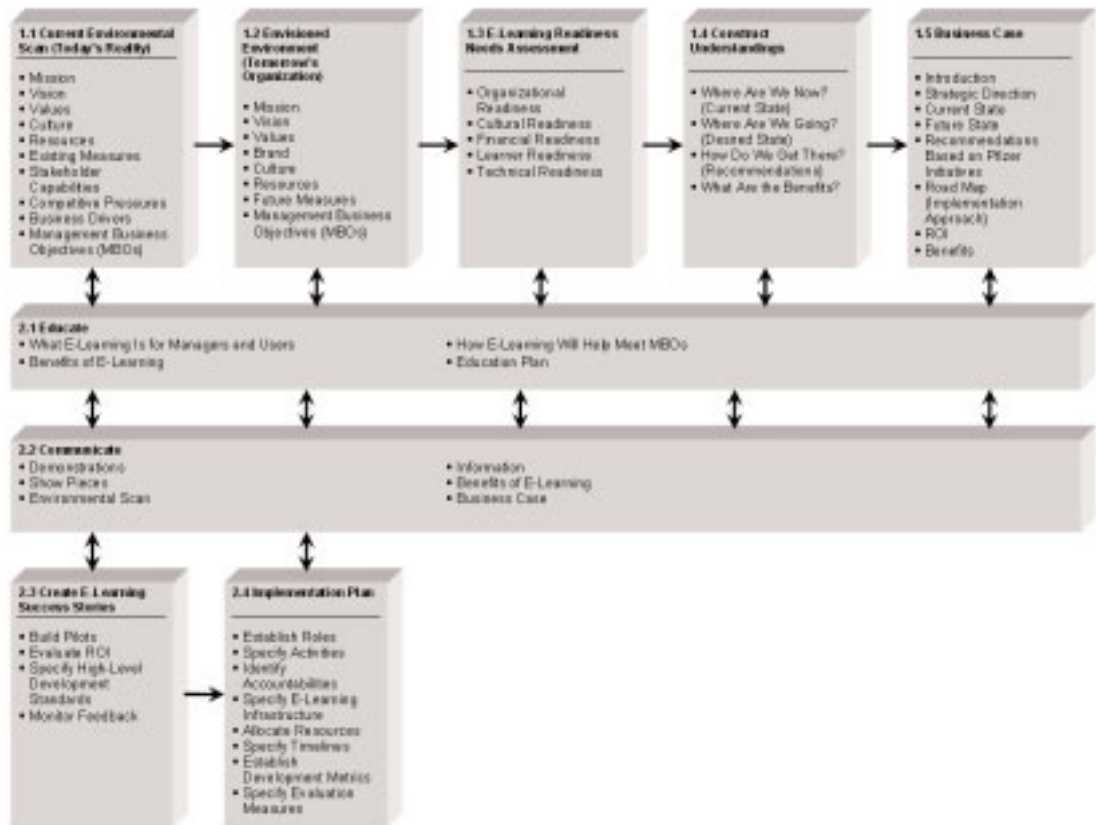


Figure 4. Models of Change Management Over Time.

Phase 1: Determine E-Learning Readiness



Phase 3: Build and Implement across the Enterprise

Figure 5. Process for Attaining EPSS/E-learning Readiness.

executives need to be collaboratively involved from the very beginning of any enterprisewide EPSS/e-learning effort. The idea here is that closing a complex pack of related performance gaps usually requires the best thinking of all stakeholders within the company and their consensus that they have appropriately closed the identified performance gaps in ways that meet business objectives.

Think of the credits that appear at the end of a movie and how they have grown as movie-making became more complex and required more types of expertise. A well-implemented EPSS/e-learning solution has a credit list that resembles the last movie you saw! Each person whose name appears in the credits has already accepted the change, providing a groundswell of support for the implementation effort.

EPSS/E-Learning Readiness

From a larger standpoint, lack of time to change and appropriate levels of buy-in result in an organizational culture that cannot hope to be ready to support EPSS/e-learning throughout the enterprise. EPSS/e-learning developers can prevent this by determining readiness and educating, communicating, creating success stories, and planning large-scale implementation. Figure 5 illustrates this process.

Phase 1. Determine E-Learning Readiness

Determining an organization's EPSS/e-learning readiness and formulating a business case to implement EPSS/e-learning successfully throughout the enterprise entails the following activities:

1.1 Conduct a Current Environmental Scan. The first step in assessing EPSS/e-learning readiness—and the step that frames all subsequent efforts in this assessment—is an environmental scan of where the enterprise and the organizations comprising it are today in terms of mission, vision, values, resources, culture, resources, stakeholder capabilities, competitive pressures, business drivers, management business objectives, and culture. Methods of conducting this scan include one-on-one interviews with senior managers and stakeholders or small-group workshops.

1.2 Determine the Desired Environment for Tomorrow's Organization. In addition to where an enterprise is currently, a clear vision of where it wants to go—an optimal desired state 2–5 years from now—is also critical. By defining future EPSS/e-learning requirements, the enterprise can envision how EPSS/e-learning will help attain those goals—within the context of the real-world issues. This process

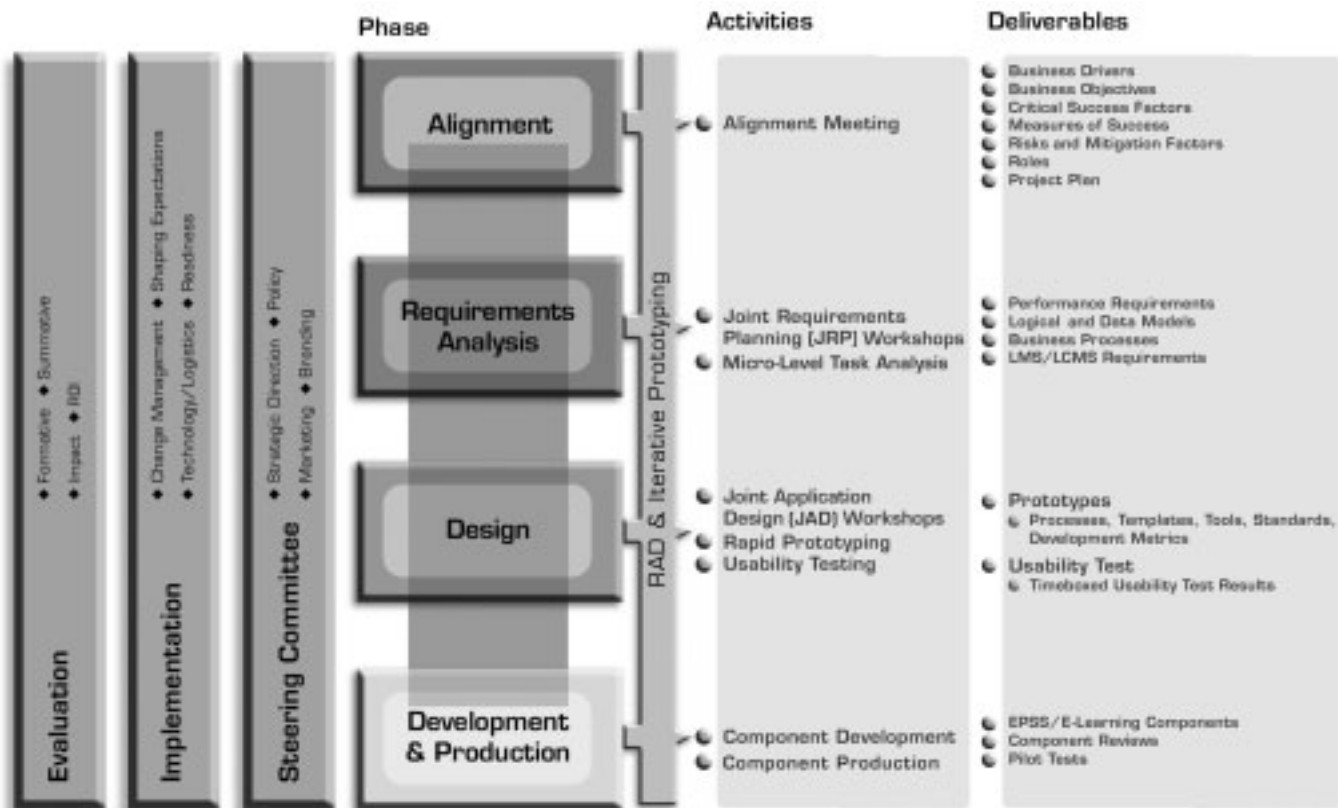


Figure 6. A RAD-Based Development Methodology.

generally requires a review of old mental models that may preclude the enterprise from achieving the desired state, as well as the development team's vision to date that will enable the enterprise to achieve its vision.

1.3 Conduct E-Learning Readiness Needs Assessment. The results of the present and future environmental scans are the foundation for the EPSS/e-learning readiness assessment itself. By gathering data via interviews, workshops (facilitated focus groups), and surveys, then analyzing that data, the enterprise can determine the following:

- **Organizational Readiness:** The extent to which the enterprise has the leadership, organization, and structure required to implement EPSS/e-learning. To determine organizational feasibility, work with EPSS/ e-learning developers to determine if leadership sponsorship is adequate, or if areas of organizational misalignment exist.
- **Cultural Readiness:** The extent to which the enterprise possesses prior expectations, beliefs, values, and attitudes that facilitate the implementation of EPSS/e-learning. In this sense, culture can be described as the way the enterprise and its constituent organizations do things.
- **Financial Readiness:** The extent to which the enterprise is willing to fund the EPSS/e-learning initiatives at the appropriate levels. Financial readiness includes the extent to which the organization measures learning in terms of class days, rather than the return on its investment in EPSS/e-learning and the extent to which the EPSS/e-learning solution meets business objectives.

- **Learner Readiness:** The extent to which learners across the enterprise possess the personal competencies and individual learning preferences that facilitate EPSS/e-learning implementation. Learner readiness also addresses the broad types of learning, information, and job support needs that enable learners to perform their jobs in ways that meet business objectives.
- **Technical Readiness:** The extent to which the enterprise possesses the technical infrastructures, relationships with other functional teams, skills, and culture required to implement EPSS/e-learning. Technical readiness also includes access, bandwidth, and computing capabilities required to create, deliver, assess, and evaluate EPSS/e-learning.

1.4 Construct an Understanding. Based on the information gained from the preceding activities, the next step is to construct an understanding of the state of EPSS/e-learning readiness across the enterprise. This understanding consists of the current and envisioned states of EPSS/e-learning, any gaps between these states, high-level recommendations for closing these gaps, and potential benefits the enterprise could accrue with the successful implementation of EPSS/e-learning.

These understandings often take the form of a series of short executive summaries, one for each organization in the enterprise. After review and approval of these summaries, a workshop would verify enterprise-level commonalities and

RAD Component	Description	Implementation Implications
Collaborative Analysis and Design	<p>End users, subject matter experts, supervisors, management and IT representatives, and the development team work together in cross-functional technical review teams (TRTs) through a series of facilitated workshops to ensure the accuracy and completeness of all deliverables, including performance requirements and prototypes.</p> <p>Managers, executives, and representatives from the development teams work together in a Steering Committee (SC) to specify strategic direction, resolve policy issues, market the EPSS/e-learning effort, and brand it.</p>	<ul style="list-style-type: none"> Opinion leaders in the TRT act as project ambassadors, generating excitement and limiting fears associated with the new enterprisewide EPSS/e-learning effort. Their efforts foment the bottom-up organizational support. The SC addresses the strategic, operational, motivational and logistic issues that attend the change process. Its efforts, along with that of the sponsor, provide top-down organizational support for the effort. The SC is ultimately accountable for ensuring that the EPSS/e-learning efforts are aligned with the strategic direction of the business in a way that meets business objectives—no more, no less.
Rapid Prototyping	Working with subject matter experts and the TRTs, the development teams create a series of iterative prototypes to ensure the completeness and accuracy of the performance requirements and the adequacy of the designs that meet them.	<ul style="list-style-type: none"> The prototypes demonstrate that the EPSS/e-learning intervention meets the performance requirements and employs a design to meet the requirements that users will accept. Prototyping enables the SC, TRT, and development teams to shape organizational expectations and ensure that there are no unpleasant surprises that would jeopardize the implementation effort. The SC and sponsor can use the prototypes as promotional pieces in their marketing efforts. TRT members can show prototypes to their colleagues, showing that opinion leaders in the organization support the effort, facilitating buy-in.

Figure 7, Part 1. RAD Components, Descriptions, and Implementation Implications.

build other areas of synthesis in the enterprise's EPSS/e-learning efforts, setting the stage for the next step: building a business case.

1.5 Build a Business Case. All successful business cases are unique. The people who prepare them know that success lies in customizing the business case to the needs of the organization and its decisionmakers. If a business case is to be adopted, its format and components need to be jargon-free and easy for senior management to understand. The case must also provide a logically adequate justification for implementing EPSS/e-learning across the enterprise.

An effective business case includes the following common elements:

- **Strategic Direction:** Formulate a strategic, enterprise approach for adopting EPSS/e-learning. This strategic direction also provides a philosophy for addressing industry and internal EPSS/e-learning standards.
- **Current State:** Summarize the current state of the enterprise, as determined by the environmental scan.
- **Future State:** Summarize the desired state of the enterprise, as determined by the envisioned environment phase.
- **Recommendations Based on Enterprise Initiatives:** Describe how EPSS/e-learning can contribute to the enterprise initiatives.
- **Road Map (Implementation Approach):** Describe the implementation plan and its rationale for the enterprisewide adoption of EPSS/e-learning. This roadmap provides a framework for EPSS/e-learning and lays the

groundwork for subsequent EPSS/e-learning implementation efforts.

- **Return on Investment (Exemplar Case):** Describe the potential return that the enterprise could expect to receive from its investment in EPSS/e-learning. This section of the business case might also describe the costs of siloed EPSS/e-learning approaches and of doing nothing (for example, maintaining the status quo.) As different organizations hold different perspectives about what return on investment (ROI) is, how to calculate it, and how to demonstrate its value to decisionmakers, this case will vary for each organization.

Phase 2. Educate, Communicate, Create Success Stories, and Plan Large-Scale Implementation

With the readiness survey and business case developed, the next task is to prepare the organization for subsequent large-scale EPSS/e-learning development and implementation. Education, communication, success stories, active marketing, attractive branding, and implementation planning are imperative for this to happen.

2.1 Educate. Work closely with developers, stakeholders, managers, and users who would be affected by the implementation of enterprisewide EPSS/e-learning to create a viable education plan and associated educational events that:

- prepare these individuals for the roles they will play in the implementation process.
- define what EPSS/e-learning means and should mean for the enterprise.

RAD Component	Description	Implementation Implications
Usability Tests	<p>A representative sample of end users tests the last iteration of the prototypes—which some refer to as a Level 3 or 4 prototype—in authentic settings to complete real-world job tasks using the EPSS/e-learning solution.</p> <p>The final usability test employs the integrated, final version of the EPSS/e-learning prototype running over the company’s Internet/intranet to ensure that it works on the company’s computer infrastructure.</p>	<ul style="list-style-type: none"> • Avoid unpleasant surprises during the pilot test and subsequent implementation and maintenance efforts by showing users exactly what they will get, how it will look, and how it will work. • Increase the amount of bottom-up organizational support for the effort. • Allow end users to request changes to the EPSS/e-learning features and functionalities in the design phase, when there is still time and money to potentially accommodate them. • Preview EPSS/e-learning readiness issues before they appear on a larger scale and while they can be addressed at reasonable cost and time frame.
SWAT Teams	<p>Specialists with advanced tools that comprise the development teams. Typically, SWAT teams address each component comprising the EPSS/e-learning effort and then work to integrate them.</p> <p>(Individual components could include hypertext information, custom software, and e-learning. The EPSS/e-learning solution would integrate these components for seamless, on-demand user access.)</p>	<ul style="list-style-type: none"> • Provide rapid and flexible responses to issues arising during the TRTs, SCs, and usability tests.
Timeboxing	<p>A management technique for prioritizing project deliverables by keeping the schedule inflexible and functionalities flexible. (That is, the schedule may not slip. The features and functionalities of the EPSS/e-learning may be scaled back, based on the assumption that 20% of a system’s functionalities will meet 80% of the end users’ actual needs.)</p>	<ul style="list-style-type: none"> • Prioritizes the range of features and functionalities that EPSS/e-learning could provide to ensure that users get what they need to meet the performance requirements—no more, no less. Timeboxing ensures that the deliverables include all required functionalities within the given schedule and cost constraints. It eliminates the never-ending scope creep that often characterizes the deployment of EPSS/e-learning projects.

Figure 7, Part 2. RAD Components, Descriptions, and Implementation Implications.

- shape expectations of how EPSS/e-learning will affect processes and roles within the enterprise and the ways in which people will perform their jobs.
- provide feedback to shape the business plan.

Education and marketing efforts could include electronic brochures, “webinars,” facilitated workshops, or other events, all of which should employ the appropriate branding. Although content will vary by enterprise, potential topics include the following:

- what EPSS/e-learning is for managers and users
- benefits of EPSS/e-learning
- how EPSS/e-learning will help meet business objectives

2.2 Communicate. Timely, straightforward, and relevant communication can ward off the rumors and political issues that often plague EPSS/e-learning implementation efforts. Create a communication plan and communicate the results of all EPSS/e-learning activities on a regular basis. Good communication will ensure that a shared mental model of the EPSS/e-learning effort exists.

Communication efforts could include emails, websites, newsletters, reports, brown-bag lunches, show pieces and other demonstrations, as well as stakeholder, manager, and user reactions to EPSS/e-learning efforts.

2.3 Create E-Learning Success Stories. Using a series of representative pilots identified in the business case, create a

series of success stories. Part of this process could be a collaborative evaluation of the ROI associated with these pilots and concurrent high-level development standards for the enterprise and its organizations. As these pilots become educational and communication pieces, they also provide a source of feedback for shaping the implementation plan and future EPSS/e-learning endeavors.

2.4 Implementation Plan. The implementation plan acts as a blueprint for creating and adopting EPSS/e-learning throughout the enterprise. Validated by the EPSS/e-learning success stories and their associated ROI, the implementation plan will systemically and systematically address issues that encourage the adoption and dissemination of EPSS/e-learning by producing quality efforts—on time and within budget.

Like business cases, successful implementation plans vary in terms of their approaches and components. Possible functions include strategies for establishing roles, specifying activities, identifying accountabilities, specifying EPSS/e-learning infrastructure, allocating resources, specifying timelines, establishing and tracking trustworthy development metrics, and specifying evaluation measures for subsequent ROI analysis.

Regardless of content, an implementation plan should be developed collaboratively to offer the greatest possible likelihood of success.

Phase 3. Build and Implement Across the Enterprise

Because corporate cultures are unique, input from developers, stakeholders, and end users is essential when building and implementing EPSS/e-learning. The third rule of successful EPSS/e-learning implementation is: Conscientiously manage change to provide the time, buy-in, and level of readiness thy company will require.

Strategies and Processes

Successful enterprisewide EPSS/e-learning solutions require different development methodologies using strategies and processes that do not treat implementation as an afterthought. Linear instructional systems design methodologies such as ADDIE employ a waterfall approach that requires practitioners to complete the analysis phase before beginning the design, development, implementation, and evaluation phases. This linear approach often means that unanticipated budget and schedule over-runs can preclude successful implementation. It's simply too little, too late.

In contrast to the linear model, successful enterprisewide implementation must begin from Day One of the project, along with project oversight from a steering committee and evaluation. In fact, strategies to ensure a successful enterprisewide implementation should occur in the earliest documents describing the EPSS/e-learning effort, including its business case; request for information, proposal, or quotation; and proposal.

Figure 6 on page 47 illustrates the components of a RAD-based (rapid application development-based) methodology (Villachica & Stone, 1998) that provides for such implementation by blending elements of the alignment, analysis, design, development, and production phases.

This methodology is based on five different components that act together to form a system of checks and balances allowing HPT practitioners to jump-start the implementation effort, while ensuring that they identify the correct causes for the gaps and select the correct interventions to close them in ways that meet the business needs. Moreover, this approach provides time to assess readiness, design a change management effort, shape expectations, and ensure buy-in across the enterprise. Prototyping in particular ensures that users and stakeholders see the EPSS/e-learning solution is being built to their performance needs and stated requests. Their ability to receive this continuous positive feedback greatly affects their buy-in of the EPSS/e-learning solution. Other benefits of this methodology include lower development costs, trustworthy development metrics, shrunken schedules, and improved quality. Figure 7 on pages 48 and 49 describes these RAD components and their implications for the successful implementation of enterprisewide EPSS/e-learning efforts.

So the fourth rule of successful EPSS/e-learning implementation is: Use a RAD-based or similar development methodology to guide the change management effort from Day One.

Conclusion

Successful EPSS/e-learning is not an accident that happens because the development effort has been completed. Rather, it's the result of the coordinated efforts of people throughout the enterprise. This fact is not surprising, as people tend to be the most important component of any technology mix—more important than the content, hardware, software, or processes that drive the company. Especially at the enterprise level, successful EPSS/e-learning implementation requires the following:

- the *alignment* of the performance solutions to business objectives to ensure they meet both performance requirements and business objectives
- a conscientious *change management* effort to provide the time, buy-in, and levels of EPSS/e-learning readiness people will need to overcome their natural resistance to change
- *use of RAD-based or similar development methodologies* to ensure alignment, provide adequate time for change, facilitate buy-in while reducing development costs, providing trustworthy development metrics, shrinking schedule, and improving quality 🏠

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What advice would you give someone on the path to becoming a master in his or her field?

Research in the area of expertise indicates that becoming a master in any field requires about 10 years of cumulative practice solving progressively difficult problems that practitioners typically encounter. My advice is to continually put yourself in situations where you can:

- Encounter field-specific problems in authentic situations.
- Obtain help from mentors, universities, and other experts who regularly solve these problems.
- Consciously invest what you learned in tackling the next problem you encounter.
- Become part of a larger community of practice by assuming active leadership roles in professional organizations such as ISPI.

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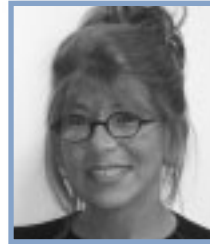
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A frequent author, presenter, and Certified Performance Technologist, Deborah completed her graduate work in instructional technology at San Francisco State University. She was ISPI's 1991-1993 Vice President of Technology Applications and a developer/presenter at ISPI's first two HPT Institutes. Deborah also coauthored the chapter on performance support systems that appears in the second edition of the *Handbook of Human Performance Technology*. She has coauthored numerous articles and presentations.

Deborah's life mission is improving human performance in ways that directly impact an organization's bottom line. She believes that HPT interventions can achieve this goal only when their design, development, and implementation are aligned with the organization's business objectives and critical success factors, and when they are part of a systemic solution to issues that reach beyond the immediate, obvious need. She may be reached at Dstone@dls.com.

Chief Learning Officer of DLS Group, **Steve W. Villachica, PhD, CPT**, is responsible for ensuring that all deliverables incorporate the best research, theory, and practice that HPT has to offer. He specializes in areas of technology-delivered performance support, rapid prototyping, learning theory, change management theory, and cognitive psychology. Steve completed his doctoral work at the University of Northern Colorado and is also a Certified Performance Technologist. A frequent author and presenter, Steve coauthored the chapter on performance support systems that appears in the second edition of the *Handbook of Human Performance Technology*.

Steve's primary interest lies in acquiring, transferring, and supporting human expertise. To this end, he is currently the co-principal investigator of an ISPI-supported research effort investigating how HPT practitioners organize their knowledge of the discipline. His favorite HPT projects involve providing performance support for people who solve complex, messy problems on the job. Steve may be reached at SVillachica@dls.com.