

## Designing e-Learning for the Enterprise

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### **Enterprise, not individual, learning**

Automobiles were “horseless carriages” before they became cars. Moving picture cameramen filmed plays before inventing movies. And training companies put courses on the web before the advent of enterprise e-Learning.

Enterprise e-Learning will not replace web-based courses, just as web-based courses have not replaced instructor-led workshops and television has not replaced the movies. Rather, for large organizations, enterprise e-Learning is the latest development in a lengthy evolution, and it is where the greatest returns will be found.

Unlike individual courses, enterprise e-Learning has the power to integrate learning into an organization’s processes, to merge learning and the job. It interconnects with an organization’s human resource systems, ERP, and knowledge management tools, and adapts to the organization’s needs. Courses are one-shot interventions; enterprise e-Learning is long-term infrastructure.

Large organizations are SmartForce’s primary customers. While serving other markets such as small business and universities, the customers that drive the firm’s development activities are organizations like Compaq, HP, Citigroup, PriceWaterhouseCoopers, Bank of America, Lucent, the U.S. Army, e\*Trade, Dell, American Express, and Xerox.

SmartForce has invested nearly \$50 million developing an e-Learning ecosystem for the future, the infrastructure for leveraging intellectual capital. The firm has amassed the world’s large e-Learning library,<sup>1</sup> manages the world’s largest instructional development staff,<sup>2</sup> has by far the most enterprise e-Learning customers,<sup>3</sup> and is recognized as the world’s largest e-Learning company.<sup>4</sup> To meet the needs of the enterprise, SmartForce has developed the first true object-oriented e-Learning application architecture.

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<sup>1</sup> More than 5,000 hours of learning, more than a terabyte of e-content.

<sup>2</sup> SmartForce Dublin Development Centre employs 500 developers. SmartForce also develops e-Learning in Canada, Australia, Arizona, and California.

<sup>3</sup> 350 enterprise customers such as PriceWaterhouseCoopers, Lucent Technologies, Deloitte & Touche, and Manpower.

<sup>4</sup> International Data Corporation.

This paper will examine enterprise learning – what’s required, how it’s designed, and how it’s delivered. We will focus on the needs of Fortune 1000 size organizations. As a concrete example, we’ll describe the development of SmartForce’s new e-Business program.

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## **Enterprise needs**

Old-style corporate learning was piecemeal. When people needed to learn something, they took a course or informally apprenticed to someone who knew the subject at hand. To compete in today’s knowledge economy, people must master new skills rapidly and efficiently, and they must learn new things continuously or fall behind.

Today’s global enterprise must be nimble, able to adapt to changing market conditions and opportunities in an instant. It must bring its people up to speed, and keep them there, on both general topics (e.g. business skills, IT skills) and proprietary processes (e.g. in-house methods and intellectual property). Cottage-industry course development cannot deliver. Hard-charging organizations don’t need courses; they need people with the skills, knowledge, and motivation to get the job done.

An e-Business is a fundamentally different animal than what most of us are accustomed to. Cycle time shrinks, demanding that all the moving parts of the business work together in real time. The organization must be able to turn on a dime. Buffers shrink out of existence. Prep time gets squeezed. Slack disappears. People are challenged to act from their understanding of the big picture rather than by following orders and rote procedures. The whales of the old Fortune 500 are being surpassed by schools of minnows, each swimming where it will but at the same time synchronized with the school.

In traditional business, organizational components were loosely coupled. Training wasn’t really tied to current business goals but companies muddled through. It sometimes took years for a competitive threat to elicit a response from the deep end of the organization and even then it was often unrecognizable after being whispered from one unit to another on its trek. e-Business is not so forgiving. It requires coordination, a unified approach, teams that learn and work together, and system-wide accountability.

Form follows function. Recognizing the demands of conducting business on Internet time, SmartForce’s information architects set out to build an infrastructure to meet these criteria:

- readily builds enterprise-wide core competencies

- smoothly scales from hundreds of learners to more than a million
- can be implemented rapidly (weeks), without taxing IT resources
- works inside or outside of the firewall
- easily administered by in-house staff
- gives the learner a single interface and set of controls for a broad array of learning experiences
- automates the assembly and delivery of instruction
- provides a path for future migration by adherence to industry standards and advance planning
- robust delivery platform for maximum uptime

To meet these needs, their blueprints called for a system that:

- seats the learner at a personal learning screen with a common set of controls for planning, assessment, instruction, collaboration, simulations, testing, certification, and news
- processes information dynamically, assembling learning experiences with up-to-the-second content from both in-house and outside sources
- incorporates the largest repository of content on IT, business, and e-business skills on earth, 100% web delivered
- is fully interoperable, available on Microsoft, UNIX, Linux, Mac platforms
- can be customized and maintained by existing in-house staff through studios with checkbox controls
- is a complete, integrated package unto itself (bypassing the inevitable finger-pointing that occurs when systems from different vendors don't easily talk with one another)
- adapts to the building blocks of the host organization
- relies on learning object architecture to deliver personalized, flexible learning

Astute companies will choose a learning infrastructure that is scaleable, robust, secure, expandable, and seamlessly integrated. They will avoid future coordination headaches if they select a single vendor to provide content, technology, and services – the whole package. Most companies need to select an enterprise learning partner with staying power now.<sup>5</sup>

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## Instructional Design

Traditional instructional systems design follows the “ADDIE” process of analysis, design, development, implementation, and evaluation; the last step feeds back into the first, creating an ever-improving process of

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<sup>5</sup> WR Hambrecht + Co., *Corporate eLearning, Exploring a New Frontier*, March 2000.  
Enterprise Instructional Design

updating and improvement. Enterprise e-Learning Design benefits from the same process, albeit at a higher level.

	<b>Enterprise e-Learning</b>	<b>Individual e-course</b>
<b>Analyze</b>	Organization needs Strategic goals	One task or skillset at a time
<b>Design</b>	Multidisciplinary teams	Individual authors
<b>Development</b>	Parallel	Serial
<b>Implementation</b>	Hosted, global, fluid, dynamic	In-house, local, rigid, static
<b>Evaluation</b>	Business results	Demonstration of knowledge or skill

Training directors selected individual courses; chief learning officers or other executive management drive enterprise e-Learning decisions.

As we'll see, enterprise e-Learning escapes the confines of the classroom metaphor (what David Gelernter calls "paradigm drag"<sup>6</sup>) to create learning opportunities that go beyond what's available in the physical world and, to use Jakob Nielsen's phrase, are "better than reality."

The enterprise learning train is leaving the station. SmartForce laid the first tracks. For a bit of background on how they got in a position to do that, let's look briefly at the evolution of e-Learning.

## **The Evolution of e-Learning**

SmartForce, then CBT Systems, developed the first computer-based training skills sixteen years ago. The firm took a production-line approach to building CD-ROM courseware that provided consistency and efficiency unavailable to firms employing a single-author approach.

As networks and the Web came into popular use in the nineties, SmartForce migrated its courseware to both the Internet and corporate intranets.

In October 1999, SmartForce introduced the first e-Learning on the Web, an externally hosted solution that combined web-based training, collaboration and 24/7 mentoring. The firm signaled its commitment by changing its name from CBT Systems to SmartForce, the e-Learning Company.

<sup>6</sup> David Gelernter, *Machine Beauty, Elegance and the Heart of Technology*, Basic Books. 1998.

A year later, SmartForce is again leading the field with enterprise e-Learning, an approach we will call “e<sub>3</sub>.”

Stage	Major benefit
CBT, 1984--	Cuts cost
Web-based training, 1998--	Anywhere, any time
e-Learning, 1999--	Faster, more effective
e <sub>3</sub> enterprise, 2000--	Transforms enterprise

The benefits are additive. Enterprise e-Learning can accelerate organization-wide change such as becoming an e-business or successful unification following a merger. Simultaneously, it would also be cutting cost, adding flexibility, reducing cycle time, and having more impact.

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## Design Fundamentals

Some things never change. People learn the same way they have for millennia, by

- Being instructed in concepts
- Discussing with peers and experts
- Practicing on the job or in simulation
- Testing their knowledge
- Getting advice from a mentor or coach
- Staying sharp by keeping up

Whether working at the big-picture level or the individual-learner interaction, SmartForce designers build on the insights and advice of thought leaders of instructional design through the ages such as Benjamin Bloom, Robert Gagné, Robert Mager, Alan Kay, Don Norman, Roger Schank, Ellen Langer, many others, Plato, and Socrates.

Some things have changed. People’s expectations, the traditional course, the role of content, and the needs of the enterprise are not what they used to be.

Learners today

- Demand to see relevance
- Have little patience
- Want to learn on their own terms

Courses are dead because

- Learning is continuous
- Learning never ends
- One size does not fit all

Content is not king because

- Content is meaningless if the learner is not engaged
- Context shares the throne in the learning experience
- Quality of experience dictates depth of learning

Enterprise learning

- Is never available “off the shelf”
- Must grow and evolve with the enterprise
- Must incorporate in-house and third-party instruction

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## Learning objects, paths, and definitions

New paradigms require new vocabulary.

**Learning objects.** Before digital convergence, learning was usually trapped in oversized containers, designed for delivery to many people at once in the name of efficiency. Courses came in one-hour chunks, off-site workshops in one-day chunks, and a resident MBA in a two-year package. What you already knew or what you wanted to learn didn't much matter.<sup>7</sup>

At SmartForce, a **learning object** is a right-sized piece of learning, perhaps ten minutes of self-contained chunk of core content with a learning objective, several learning points, and a link to evaluation questions. Learning objects are labeled<sup>8</sup> in a way that enables software to configure them into a variety of individual learning paths.

For most vendors of e-courses, learning objects are chunks of content. They take this limited view because they are accustomed to “repurposing” old-media courses. When breaking a pre-existing workshop or book into pieces for Web delivery, it's easy to emphasize content to the detriment of delivery.

Because SmartForce is designing learning experiences, focusing on how to engage learners as well as what's they are expected to learn, its designers recognize four broad categories of learning objects:

1. **Instructional objects – because information is not instruction.** Web-based training with or without audio, web links, and interactive text. Archived seminars and workshops. Articles. White papers. Case studies.

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<sup>7</sup> Adapted from *Into the Future*, a white paper for the National Governors Association and ASTD Committee on Adult Learning & Technology. Wayne Hodgins directed the research; Jay Cross wrote this particular section.

<sup>8</sup> With “metatags,” information about information, that describe their content, sequence in learning paths, invitation to learners, and so forth, in accordance with industry standards.

2. **Collaboration objects – because people learn by working with others**, in study groups or problem-solving sessions. Teamwork in learning builds trust and relationships that live on long after the training experience. Collaboration objects include live help, expert-led chat, on-line seminars, live workshops, and project team meetings.
3. **Practice objects – because people learn by doing**. Conceptual simulations (“sims”) for complex decisions, software sims for hands-on practice in GUI environments, coding sims, 3-D environments, role-play simulations for sales and e-commerce practice, competitive learning games, and business modeling sims for learning financial skills.
4. **Assessment objects – to recognize what has been learned**, before or after a learning experience. e-Testing is paperless, quick to set up, and provides immediate, summative results. Applications include screening, remote certification, and test-out.

In theory, people could build their own curricula from learning objects. In practice, most turn to pre-selected sequences of learning objects called **Learning Paths**. A Learning Path is typically 15 to 20 hours long. You might think of it as an extremely flexible course. Unlike a course, a Learning Path comes with a variety of additional, optional resources. Learning Paths cover topics such as Setting up an e-Business, Cisco CCNA, Leadership, or ISO 14000 compliance. A Learning Path covers what the learner needs to know to master a topic or achieve certification.

**Resources** supplement the core Learning Path with related Web links, articles, online presentations and events, games, projects, documentation, and glossaries specific to the Learning Path and the learner’s individual interests. SmartForce subject matter experts continually make new material available. Learners often make MySmartForce their home page in order to start the day with fresh material in the subjects that interest them.

**Functions** are unplanned, live, collaborative events such as Mentoring, WebEx meetings, or impromptu chats. **Mentoring** events each have a minimum response time by a qualified mentor (in sharp contrast to next-day email-only systems or bulletin boards where learners answer one another’s postings.) Questions asked in the online discussion area are recognized within a maximum of two minutes, and generally receive an immediate response. Email questions are answered in two to four hours. General discussion groups are monitored a minimum of four times a day. Mentors are certified in the fields they advise in; many are multilingual; all are SmartForce employees.

A **Learning Portfolio** is a group of related Learning Paths, Resources, and Functions. Earning Portfolios cover broad areas such as e-Business,

project management, interpersonal skills, 35 different technical certifications and even traditional business and finance, including undergraduate degrees.

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## **Designing a New Learning Portfolio**

Having authored the largest library of IT training titles on CD-ROM, more than 1,200 titles in all, SmartForce had created a very efficient process for keeping development projects on schedule and within budget. The product development cycle was nine steps, each completed by a specialist department such as Writing, Editing, Graphic Design, or Testing. The first CD in a series might take 16 weeks to complete, the second 4 weeks. The process was lumpy, with each stage dependent on the next.

e-Learning has changed all that, for it involves working with an environment, not discrete a course. It has required SmartForce to become an e-Business. The nine steps are being collapsed to five. Interdisciplinary teams are replacing the specialist departments. Development has been dispersed among the Dublin Development Centre, Fredericton, Nova Scotia (for preparing mentors and articles), Scottsdale, Arizona (for roleplay simulations), Philadelphia, Pennsylvania (for leadership and financial simulations), Australia (for soft skills), and Redwood City, California (for live learning events).

The initial step of curriculum planning is little changed, although more coordination is required. The U.S. team monitors products and certifications in the pipeline with SmartForce's vendor-partners, as well as non-IT trends. They work in conjunction with SmartForce subject matter experts at the Dublin Development Centre who also work with development teams and validate content.

Next up is in-house training, to bring the team up to speed on the subject they'll be working on. This is most often instructor-led training. A development team consists of 20 to 25 people, an IT expert, a project manager, a team leader, writers, editors, designers, and perhaps a sim developer. Team members will be working with one another on a particular Learning Path, and everyone must get to know the territory.<sup>9</sup>

From this point forward, the team is working to produce a Learning Path that is as instructionally sound, technically valid, visually appealing, and engaging to the learner as it can possibly be.

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<sup>9</sup> Development staff in Canada, Australia, and the States will undergo training in parallel when appropriate.

One learning object at a time, editors, writers, SMEs, designers, and scripters draw up storyboards showing how they'll present the material in a way that keeps learners engaged. They brainstorm ways to draw the learner in. They seek opportunities to keep the interaction level high. At the end of the storyboard session, everyone can start to work right away. Without rewrites. Or tangents. For they all share a common vision.

Moving from functional departments to interdisciplinary teams has been a massive cultural change. Results are already in evidence. Cross-fertilization is apparent. Many ideas are flowing. There's more ownership and accountability for projects, and more satisfaction, too. People are talking with one another. You can almost feel the creative ferment. The e-Business team was first to adopt the team structure and everyone who has seen their output is impressed with its sparkle and depth.

Under the previous regimen, Onscreen Review was the first time anyone saw all the pieces of a course in their entirety. Now individual objects go forward instead of entire courses, eliminating a production bottleneck. The writer and designer check their work together and must be happy before anything moves into review.

The review process is exacting. Visual design review checks that graphics are consistent, appealing, and within SmartForce standards. Someone who has never seen the material before edits it for on-screen text errors, validity of questions, instructional nature, flow, and sound. The IT expert reviews the package. Environment testing makes sure the object plays under NT, 98, IE5, Netscape, and other platforms. Functionality testing makes sure the buttons work, audio comes at the right time, exploratory exercises work, test questions are valid, and feedback is appropriate.

At this point, the team is confident that the learning object is sound, looks great, and is as good as they can make it.

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## **The Learner Experience**

Learners who jack into the SmartForce e-Learning environment find everything they need in one place, coordinated and easily accessible. Gone are the days when every training course seemed to start at ground zero. The moment this new system recognizes you, it's aware of your goals, your career path, your experience, what subjects interest you, your job requirements, and your preferences. The more learner participates, the better the system gets to know them.

The learner is at the controls. Want to practice or to learn new skills? Generic or in-house processes? Five minutes or two hours? Test out of what you already know or dive right in? Join a seminar or hop into a simulation? Brush up on business skills or continue toward an IT certification? It's all in there, readily accessible, a few clicks from the point of entry.

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## Managing Enterprise e-Learning

At a recent online learning trade show,<sup>10</sup> three hundred purported vendors of eLearning filled the Expo. Closer inspection showed that most offered only pieces of eLearning. Dozens were selling assessment tools. Fifty were selling learning management systems. Hundreds were selling courses.

Theoretically, one could assemble an integrated eLearning environment from these pieces, but it would be akin to building your own car from a collection of spark plugs, engine parts, body panels, and so forth. This seems flexible. Until you turn the ignition key and nothing happens.

SmartForce has built an entire vehicle; it's called e<sub>3</sub>. The e<sub>3</sub> e-Learning architecture integrates all of eLearning's moving parts in one system. e<sub>3</sub> glues together

- a powerful Learning Management System
- a robust personalization engine
- toolsets for publishing content
- a traffic cop for routing messages
- studios for administrative reporting and control
- a content publishing system

The learning management system incorporates registration, financial tracking, events, assessment, and testing. It enables organizations to incorporate their own content and make it trackable. It fits the real world, where some programs are long-lasting, rich-media productions and others are quick-and-dirty ten-hour start-to-finish news and emergency broadcasts. Secure e-testing supports in-house certification programs and instant accountability reporting.

A suite of administrative studios streamlines the processes of content selection, report generation, and interface control.

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<sup>10</sup> OnLine Learning 2000, Denver, Colorado  
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- Building learning paths, modeled on the shopping cart metaphor on e-commerce sites, makes selecting and assigning content to learners intuitive.
- Pre-configured reports show e-Learning activity by topic, participation in learning communities, and interaction, totaled by department, business unit, and/or enterprise. An Export Wizard feeds learner information and progress reports into HR databases or other learning management systems.
- Administrators can select learner options with the push of a button in the User Interface Studio.

e<sub>3</sub>'s compliance with industry standards,<sup>11</sup> combined with its content publishing capability, enables organizations to build their own best-of-breed eLearning environment by adding and tracking their own or third-party learning objects.

Aside from the power of harnessing all parts of eLearning to a single yoke, e<sub>3</sub> brings single-source accountability. If something fails to work, the administrator knows who to call. SmartForce customers receive one invoice, not fifty.<sup>12</sup>

e<sub>3</sub> produces optimal learning for each and every learner by bringing everything together in a personalized learning experience.<sup>13</sup>

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## Delivering the Goods

In its CBT days, SmartForce gained unparalleled experience delivering instruction behind the firewall. For most organizations, experience has taught us that in-house delivery is *not* the optimal way to deliver and manage e-Learning.<sup>14</sup> To maximize shareholder value, companies must focus all their energy on core activities -- and outsource everything else.<sup>15</sup> Appropriately enough, the enterprise IT department's first priority is serving core and mission-critical needs. In the past, this meant putting support functions such as learning on the back burner.

Now that learning and knowledge are too important to delay, SmartForce designed e<sub>3</sub> for implementation with minimal disruption to in-house IT.

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<sup>11</sup> AICC, IMS, LRN.

<sup>12</sup> This is not to suggest that SmartForce suffers from "not invented here" syndrome. e<sub>3</sub> seamlessly integrates the latest web technology from HP, Exodus, USi, Oracle, Microsoft and BroadVision.

<sup>13</sup> Individualized instruction relies on the same 1-to-1 personalization technology Sony and Walmart use to serve over a million simultaneous personalized requests.

<sup>14</sup> Nonetheless, SmartForce delivers instruction on the Internet, behind the firewall, and offline. Ironically, one company that brags of being "born on the web" cannot deliver by any other means.

<sup>15</sup> *Living on the Faultline* by Geoffrey Moore  
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Internet access is the only thing required to access a particular organization's custom SmartForce environment. The entire e-Learning infrastructure is hosted on ultra-secure state-of-the-art server farms employing leading-edge Internet infrastructure technologies, including organization servers and redundant, multi-homed connections to the Internet backbone.

Note that this is much more than simply accessing a course on the Web. e<sub>3</sub> recognizes individual learners and their accomplishments, interests, and styles no matter where they log in from. e<sub>3</sub> hosts the entire organization's learning management, record-keeping, and customer environment, whether it's for 2,500 senior professionals at a high-ticket consultancy or 75,000 customers of Dell Computer.

This e-Learning focuses on the enterprise, not the course. Organizations apply e<sup>3</sup> for transformation. Going far beyond its roots in training, SmartForce e-Learning supports enterprise initiatives such as:

- Retool the marketing function for e-marketing
- Virtually launch new products
- Radically upgrade customer service and CRM
- Accelerate and improve the merger of disparate organizations
- Reinvent the company as an e-Business
- Ensure compliance in sexual harassment and other areas
- Certify the technical literacy of large populations
- Ensure readiness for new technology rollout
- Enlighten the entire supply chain
- Manage human capital globally