A Guide to Learning Management Systems

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Executive Summary

Online learning solutions consist of three primary components: content, services, and infrastructure/tools. Content includes both self-paced and instructor-led course materials, as well as online reference books and labs. Services include human interactions which support the learners' experience, such as instruction, mentoring, and technical support, and support for the training managers, including site and courseware development. Finally, the infrastructure and learning management tools include the online learning environment and administrative tools used by the training manager. The learning environment and training management tools are commonly referred to as the "learning management system," or LMS. These components may be acquired from different partners or developed independently, but are all critical to creating an optimal online learning experience. This paper focuses on the LMS component, describing its primary features and functions, and the qualities that make the Element K LMS solution unique.

As a leading online learning solution provider, Element K offers users world-class LMS functionality. In 1996, to support its eLearning solution, Element K launched one of the market's first and most widely used hosted LMS. Since then, Element K has provided users with a fully-featured, hosted LMS as part of its eLearning solution. This feature allows customers to easily and effectively deploy and manage eLearning across their organization.

The LMS software solution that supports the delivery and management of learning, can be categorized into eight major modules:

❶ **Student Management and Reporting.** This module allows training administrators (TAs) to organize other administrators and/or students into logical groups, and to track and report on student progress and activity.

❷ **Learning Event and Resource Management and Reporting.** This module allows training administrators to logically organize courses and events in catalogs, provide courses to students through the use of access rights and registration, and manage all class-related resources, including classrooms and instructors. This module also supports the communication functions between administrators and students and the reporting of student activities.

❸ **Online Course Delivery Infrastructure.** This module allows training administrators to establish and deliver online, instructor-led courses in either synchronous or asynchronous modes. This function includes course set up, the display of a syllabus, and all requisite registration and tracking.

❹ **Course Authoring Tools.** This module allows new (proprietary) courses to be created by either the organization or a third party. These tools promote consistency in course look and feel and ensure conformity to industry standards so that compatibility between the course and the LMS is maintained.

❺ **Skill/Competency Assessment.** This module assesses student skills in order for a personalized learning path to be prescribed, and, after training, determines the knowledge that has been retained. This module also allows the training administrator to create, edit, distribute, and deliver assessment tests and to track and report on student achievement.

❻ **Professional Development Management.** This module allows a student's job role and functions to be established in the LMS for the purposes of tracking and reporting professional development progress against a predefined set of training goals.

❼ **Knowledge Bases.** Allows the LMS to integrate specific learning references or to access external learning references as a supplement to the core set of online courses.

❽ **Learner-Centric and Organization Personalization.** The ability of the LMS to identify a student by the student's profile and to deliver targeted courses, news, references, and other information to continually engage the student in the learning experience.

Beyond the features and functions of a LMS, there are additional characteristics crucial to the LMS environment. These characteristics dictate hardware and operating system requirements, the level of required maintenance, the extent to which the LMS can be integrated with other systems, and the degree of security and reliability that can be expected.

❶ **Internet Hosted LMS versus locally deployed LMS.** A hosted LMS is accessed from an Application Service Provider (ASP) through the Internet, as opposed to being installed on local hardware. An Internet hosted LMS lowers the users' costs for both hardware and software, allows for continuous content and feature updates with no local intervention, and promotes faster implementation. Element K offers a hosted solution.

❷ **Integration of LMS with other systems.** Although a LMS may provide comprehensive functionality, some companies may wish to continue using existing HR systems. In this case, it may be advantageous for the LMS to be integrated with these systems so that data files may be shared.

❸ **Degree of LMS Security.** Any LMS must protect and keep secure employee data and proprietary content. A good system will utilize IDs and passwords at various levels, encryption keys, and IP address restrictions.

1: Learning Management System Overview

Definition

Individuals and companies use the term "Learning Management System" (LMS) to refer to any software solution that supports the delivery and management of learning. Two competing LMS systems may provide substantially different capabilities. Just as the term "ERP" may refer to anything ranging from financial to human resources to manufacturing MRP software modules, LMS may refer to any one or combination of modules–or sets of functionality. There are over a hundred LMS suppliers on the Web with a wide range of functionality. The only common element among these suppliers is that they offer software that supports learning.

LMS Modules

While not a standard convention, it is useful to refer to the possible sets of LMS functionality as "modules." Each of these modules offers a unique set of functionality. Just as in ERP, these modules may be fairly independent or tightly integrated with the other modules in the system:

- Student Management and Reporting
- Learning Event and Resource Management and Reporting
- Online Course Delivery Infrastructure
- Course Authoring Tools
- Skill/Competency Assessment
- Professional Development Management
- Knowledge Bases
- Learner-Centric and Organization Personalization

Student Management and Reporting

Overview

Student Management and Reporting encompasses a wide range of features. At the most basic level, student management requires the use of passwords to register for or to access a class. Additional student management features may include functions that allow an organization to deploy, manage, and track their students' participation and learning progress.

Client Needs

Consider the needs of Brian Watson, a training administrator for XYZ Company. Brian is given the task of managing the training for 2000 employees located in three different cities. Brian has recruited a couple of training administrators at each location to help roll-out a self-paced online training module for a new software package called Productivity Express 2.0, as well as instructor-led training for XYZ quality standards for the engineering staff at each location. He also wants to provide some broadly beneficial course material to the employees to meet a wide variety of functional training needs.

In reviewing LMS solutions to support his needs, Brian must consider several questions:

❶ **How will he set up student records and distribute student access rights?** Does he have the ability to import student data? As an alternative, does he have the ability to refer students to a location to self-register? Does he have the ability to import and/or collect data associated with each student, such as location, division, department, and title (which may require the LMS to support custom fields)? What about IDs and passwords or enrollment keys?

❷ **How will he distribute training administration functions?** Is he able to create and manage six TAs and customize their access (assign them rights to create, modify, and delete student information, run reports, add content, and send messages)?

❸ **Will he be able to identify and report on training and usage activity?** Brian needs to report on which students registered for training, which students have taken training, and track assessment results.

❹ **Will he be able to create student groups and report by group?** Not only does Brian need to allocate groups of students to his designated TAs, Brian needs to report on the progress of training to each division manager, and will want to easily run reports by division.

Features

Various LMS systems will support Brian's needs to various degrees. Some of the features that he may need include:

❶ **The creation of student records and the distribution of student access rights.** This feature allows the administrator to:

- import student data for batch site registration.
- manually set up a student.
- distribute user IDs and passwords via email.
- distribute enrollment keys to allow students to self-register.
- allow anonymous browsing of the catalog, with site registration required upon course selection.
- set up access to different course offerings based on student groups.

❷ **Support for distributed TA functionality.** This feature allows the administrator to:

- set up multiple TAs with specific user rights to manage students, content, and messaging.
- create and manage student groups.
- assign TAs to students and student groups.

❸ **Comprehensive reporting.** This function provides:

- standard reports showing site activity, course attendance, and student progress.
- custom student record fields on which to run reports.
- custom reporting functionality.
- charge back capabilities.

❹ **Messaging.** This process allows the TA to:

- create and distribute messages within the site for student groups.
- distribute messages by student or student group through email.

Learning Event and Resource Management and Reporting

Overview

Learning Event and Resource Management features vary widely across LMSs. At the low end, a LMS will allow the TA to create or manage a list of available courses. At the high end, the LMS may give the TA the flexibility to dynamically display the course catalog based on the student or student group, the ability to manage instructor-led classrooms and instructor resources, the ability to manage course registrations, and much more.

Client Needs

Just as TAs need to manage their students, they also need to manage their learning content and events. TAs need the capability to create, manage, communicate, and report on a wide range of learning opportunities:

- Traditional Instructor-Led (bricks and mortar) training courses
- Online Asynchronous Instructor-Led Courses (eILT)
- Online Synchronous Instructor-Led events
- Self-Paced Multimedia Courses
- Knowledge Bases
- Other Resources

At a global level, TAs need a way to create and manage a catalog of learning opportunities. They need the ability to make the catalog, or a subset of the catalog, available to each student.

At a micro level, the TAs need the ability to set up a single course, to set up multiple instances of the course, and to assign resources, including classrooms, instructors, and equipment. They may need the ability to manage registrations for courses and events that have finite capacity.

In reviewing LMS solutions to support his needs, Brian Watson, our TA for XYZ Company, must consider several questions:

❶ **How will he add courses to the catalog?** Can he easily add self-paced courses, ILT courses, and events to the course catalog? Can he add multiple instances of a single course in multiple locations?

❷ **How will he make the courses available to the right individuals and groups within the company?** How can he make sure that each group views the appropriate courses?

❸ **How will he manage the resources required to run the ILT course at each location?** Can he schedule physical resources and instructors based on their availability?

❹ **How will he manage student registrations and "wait lists"?** Can he manage the registration process, including creating and managing wait lists?

❺ **How will he report on usage?** Can he report on attendance and course completion?

Features

Some of the features that Brian may need include:

❶ **Course Catalog Management and Tools.** This feature allows TAs to:

- add self-paced courses.
- add and manage ILT courses and classes.
- display the course catalog, class dates and times, when appropriate.
- create and display a course syllabus.
- preserve recommended and required courses.
- use search tools that help users find what they need. It is critical that users have the ability to search by course name, course code, subject, location, skill, certification, or delivery channel.

❷ **Course Access Rights and Distribution.** This feature allows the TA to:

- restrict access to courses based on student group, location, job function.
- support manager notification and/or request for approval.
- control course display in course catalog.
- display course as recommended or required.
- enforce course prerequisites.
- prioritize course access and wait list sequence based on payment type, group priority, etc.

❸ **ILT Course Resource Management.** This feature allows the TA to:

- maintain a database of resources, including classrooms, instructors, and equipment.
- assign/schedule resources to specific classes.
- easily view and manage schedules for any resource.

❹ **Class/Event registration management.** This feature allows the TA to:

- schedule multiple instances of a single course.

- enable course registrations, capacity, and wait lists.
- notify students or wait-listed individuals of changes in course status.
- bulk register a group of students.
- restrict which courses are eligible for registration cancellation.
- initiate cancellation or registration at the individual student level. (The learner could also perform this function.)

❺ **Reporting.** This feature allows the TA to:

- run reports on course attendance or use.
- run reports on pre- and post-assessment results.
- create custom reports on courses, classes, or resources.
- track multimedia self-study courseware (by time, pages, or lesson completed).
- track virtual classrooms (by time, attendance, or pages).
- use learner evaluation systems for courses.

Online Course Delivery Infrastructure

Overview

Over the past several years, a number of new methods for course delivery have emerged, including online instructor-led courses and online synchronous ILT courses. Additional online learner support has emerged, such as mentoring and other access to subject matter experts (SME) through email, chat, and message boards. LMSs support these new methods of instruction to various degrees.

One type of online course is an instructor-led course, a course which uses a message board for a classroom. This course is "asynchronous": the instructor and students do not need to be online at the same time. This type of course allows students to access content, to view assignments and projects, and to participate in discussions through a threaded message board.

A second type of online course is a "synchronous" instructor-led class: the instructor and students are online at the same time. Several software vendors offer tools to create and deploy synchronous courses, including Centra and iLink. This software allows the instructor to communicate with learners using audio and slide presentations, and allows students to view the software on their screens. Some tools allow for two-way audio, video, and application sharing. Recording of class sessions for later viewing is also available.

A third type of course is self-study, which does not necessarily involve an instructor.

Increasingly, the lines between these course delivery models are blurring. However, these delivery methods serve as the foundation for hybrid learning solutions.

Client Needs

Instructor-led online courses have several advantages over traditional ILT courses, providing a more cost-effective way to deploy training across a widely distributed workforce. A TA who wishes to implement instructor-led courses needs the tools and infrastructure to easily set up and run these courses. Moreover, the TA will need to integrate the distribution, registration, and general management of these courses through the same system and process as other learning events.

Consider this scenario: Mike McRep, a TA, would like to deploy monthly product training to his sales organization through "synchronous" classes, as well as general sales training through an asynchronous instructor-led course. In order to implement this training, Mike must ask the following questions:

❶ **Does his LMS provide native support for instructor-led online courses using message boards?** Does the product provide a template for setting up the course? Can he add classes to the course catalog? Can he manage course registrations?

❷ **Does his LMS provide native support for instructor-led online courses using synchronous software?** Does the product provide a template for setting up the course? Can he add classes to the course catalog? Can he manage course registrations?

❸ **Does his LMS offer tools or methods to build self-study online courses?** Can he upload courses created in offline authoring tools such as Authorware, Director, Toolbook, or Flash? Does the LMS offer integrated course authoring tools?

Features

Some of the features that Mike may need to include:

❶ **Native support for online instructor-led courses through message boards.** This support allows the TA to:

- set up new courses.
- create and allow the viewing of course syllabi.
- open courses for registrations.
- support course delivery.

❷ **Native support for online synchronous events.** This function allows the TA to:

- set up a new course.
- create and allow viewing of course syllabi.
- open course for registrations.
- create an infrastructure to support course delivery.
- distribute necessary client software.
- track attendance.
- record events for future attendance.

❸ **Support for creation of online self-study courses.** This feature allows the TA to:

- upload courses created in offline authoring tools (like Authorware, Director, Toolbook, Flash).
- create self-study courses within the LMS using integrated authoring tools.
- create an infrastructure to support course delivery.

Course Authoring Tools

Overview

For the various course modalities, multiple methods and tools are available to create courses in each modality. Several of the LMSs offer tools that facilitate the creation of courses:

❶ **Self-Paced Courses.** TAs wishing to create self-paced courses have the greatest selection of tools. Most of these tools involve client-side software, although a couple of LMSs offer "online" course creation. Most of the course creation tools integrated into the LMS are limited in capabilities, offering only the ability to present text and graphics in a progressive style delivery. Formatting options are usually very limited. For more engaging course presentation, TAs must use Third Party client software packages to create the course and then upload these courses into the LMS catalog. Examples of leading software used to create courseware include Macromedia Authorware, Macromedia Director, Macromedia Flash, Macromedia CourseBuilder (Macromedia is discontinuing this product) and Click2Learn's Toolbook.

❷ **Asynchronous Instructor-Led Courses.** Course creation tools for this type of course modality usually consist of templates for the syllabus, lesson plan, activities, etc.

❸ **Synchronous Instructor-Led Courses.** Course creation tools for synchronous courses also typically consist of templates that allow the instructor to establish a course syllabus and outline. They allow the instructor to create presentation slides, quizzes, and surveys.

Client Needs

TAs are often responsible for creating courses to support their learning initiatives. Therefore, they need access to tools that help them with this task. These tools differ for each learning modality.

In evaluating LMS alternatives, TAs may ask several questions about their needs:

❶ **Can the TA upload self-paced courses created with Third Party authoring tools?** If so, which types of technologies are supported (Flash, Shockwave, HTML, Java, etc)? Can the LMS track course activity? Is the LMS compliant with the leading standards, including IMS, AICC, and SCORM? Is the course upload process easy to use?

❷ **Does the LMS offer an integrated, self-paced course-authoring package?** Does this course authoring consist of client software? If so, can it be downloaded or distributed? What are its capabilities and flexibility? Can it support text, graphics, embedded animations, or video, etc?

❸ **Can the TA or Instructor create asynchronous instructor-led courses?** How flexible is the template?

❹ **Can the TA or Instructor create his or her own synchronous instructor-led courses?** How flexible is the template?

Features

Some of the features that a TA may need include:

❶ **Third Party learning object support (self-paced courses).** This feature allows TAs to:

- launch and deliver learning objects.
- provide support for Shockwave, Flash, Java, HTML, and Video files.
- offer Completion Tracking and Bookmarking.
- comply with AICC, IMS, and SCORM standards.
- administer self-service course loading.

❷ **Self paced course authoring.** This feature provides:

- integrated self-paced course authoring and publishing.
- database-driven, dynamically created content presentation.
- presentation flexibility.
- the ability to author tests, including multiple choice, multiple select, true/false.

❸ **Asynchronous instructor-led course authoring, providing templates for course content.**

❹ **Synchronous instructor-led course authoring, providing convenient tools for course creation.**

Skill/Competency Assessment

Overview

Assessment determines a student's level of knowledge and skill in a particular job role, job function, or specific task. Pre-assessment, or prescriptive assessment, is often used prior to the implementation of a learning plan to identify individual skill gaps and to prescribe a learning path that contains only the needed training. Post-assessment often follows the learning program and can be used to track the student's progress as well as to evaluate the effectiveness of the learning.

Assessment tests may be offered at the job role or job function level, and may contain multiple questions. Assessment content must be closely tied to the learning objectives. In order to provide effective, personalized learning paths, the assessment and content must be provided at a level that correlates to the task and associated knowledge needed to complete the task.

Assessment functionality within a LMS involves the ability to create, manage, and distribute assessments. The LMS may also be able to use the assessment results to recommend which learning events are required to fill an individual student's skill gap. Finally, the LMS may also allow a TA to report on the change in knowledge and skills as a result of training.

Client Needs

Assessment allows an organization to increase both the effectiveness of training and the efficiency of training time by presenting the student with targeted training that meets organizational needs and personal skills gaps. In short, students only learn those skills relevant to their jobs.

As an example, a TA may wish to implement a training program for 50 corporate network administrators. Each of the network administrators has different backgrounds and experiences, and, therefore, different training needs. First, the TA would choose what functions and tasks are relevant to the network administrator position. Second, the TA would require an assessment for each student based on those essential functions and tasks. Third, the TA would evaluate the results, discovering that some individuals required basic training, while others needed only training in specific areas.

In reviewing assessment functionality included within an LMS, a TA may ask several questions:

❶ **How will the TA create and edit assessments?** Does the LMS allow the TA to dynamically create an assessment based on existing roles, functions and tasks? Create custom assessments and link them to learning objects, create assessment questions? Which types of questions? How does the TA associate the question with the learning object?

❷ **How will the TA distribute the assessment test?** Can the TA display the assessment test to the student? Does the LMS provide a method for the student to take the assessment online?

❸ **How will the TA create personalized learning plans?** Will the LMS create a recommendation based on the assessment results?

❹ **How will the TA report on pre- and post-training assessment results?** Can the TA report on those students who have taken the assessment and view the results? Can the TA compare pre- and post-assessment results?

Features

Some of the features that may be needed are the ability to:

❶ **Create and edit assessments.** This feature allows the TA the ability to:

- create or edit an assessment question.
- associate the assessment question with a specific learning object or event.
- support multiple question types, including multiple choice, true/false, multiple select.

❷ **Distribute and deliver assessment tests.** This feature allows the TA to:

- create and deliver assessment tests by job role or job function.
- create and deliver assessment tests by course.
- deliver assessment tests.

❸ **Create a personalized learning path from assessment results, allowing the TA the ability to indicate recommended learning based on assessment results.**

❹ **Report on assessment results.** This function allows the TA to:

- report on which students have taken assessment tests.
- report on results of assessment tests.
- report comparing pre- and post-assessment results.

Professional Development Management

Overview

Professional Development Management includes a number of methods to track, plan, and report on employee job roles, job functions, and tasks, including certifications.

Client Needs

A primary goal of training is to increase skills that improve productivity and competitive position. A primary role of the TA is to enhance the skills of a company's employees.

An important component of any learning program is the identification of job roles and functions, as well as the identification of tasks that are required to perform these job functions. The objective of training is to build the competencies that allow employees to perform in their existing job roles or to prepare for future job roles.

In designing an educational program for a group of technical support representatives, a TA must identify which job functions these technical support reps are expected to perform then determine the tasks required to perform these job functions. For example, if the job function is to "log technical support issues within a Customer Relationship Management system," then the TA must identify the tasks required to perform this function. Those tasks may include (1) determining the necessary technical information, (2) navigating and entering a "case" into the CRM system, and (3) resolving certain level 1 issues.

In evaluating various LMSs, the TA may need to ask the following questions:

❶ **Can the TA create and edit job roles and job functions?**

❷ **Can the TA create and edit competencies (tasks), and assign these competencies to job functions?**

❸ **Can the TA report on a skills inventory, including certifications for all students?**

Features

Some of the features that might be needed include:

❶ **Job roles and functions.** This feature allows the TA to:

- create and edit job roles (and profiles).
- create and edit multiple career paths.
- create and edit job functions and associate job functions with roles.
- link to off-the-shelf skills dictionaries.
- generate student skill profiles, including 360 reviews, off-the-shelf assessments, and self-definition.

❷ **Tasks:**

- to create and edit tasks.
- to associate tasks and knowledge needed to complete the task with job functions.
- for students/administrators to view and evaluate their knowledge/skill set against pre-defined job/position profiles.

❸ **Reporting,** allowing the TA to:

- report on knowledge/skill inventory by individual.
- report on job roles proficiency.

Knowledge Bases

Overview

Currently, we are witnessing the convergence of formal training, reference learning, and help desk support. Each of these exists for the purpose of providing users with the knowledge required to successfully perform their job.

Reference learning includes keeping and referencing a course book used in previous ILT courses as well as keeping trade books on an office bookshelf and referring to them when necessary. Increasingly, companies are investing in electronic databases of information, often referred to as "knowledge bases." These knowledge bases are used to collect and store information that can be accessed and searched by other employees. They may include solutions to technical problems or even programming codes that may be re-used by other groups.

For the knowledge base to be a useful tool, the TA must be able to input content and to distribute information, including wide access to relevant groups and search capabilities.

Client Needs

TAs may wish to create a corporate learning center, or corporate university, which provides a centralized resource for all types of information. In particular, TAs may wish to integrate knowledge bases within the functionality of their LMS.

In evaluating LMS alternatives, a TA may have several needs:

❶ **Does the LMS offer the ability to link to external knowledge bases?**

❷ **Does the LMS offer the ability to create a knowledge base?**

Features

Some of the features required to address these needs include:

❶ **Access to external knowledge bases:**

- Links
- Search of external XML Knowledge Bases

❷ **Integrated knowledge base:** the ability to tag, store, and retrieve multiple file types, including Word, Excel, PowerPoint documents, multimedia files, and video.

Learner-Centric and Organization Personalization

Overview

Every learner and organization is unique. The LMS offers various levels of flexibility in meeting the learner and organizations' unique needs.

Client Needs

Each learner represents a unique combination of job roles, career goals, skills, and interests. Furthermore, each learner has distinct preferences regarding content and presentation. Learners who are provided personalized information and resources will come to rely on the LMS more often, and are more likely to improve skills and provide benefit to the organization.

Likewise, each organization has unique needs and requirements. But in general, each organization needs to attract and retain quality employees. A personalized learning site allows them to target learning and communications to employees. It also indicates the organization's sincere desire to develop and invest in their employees.

Features

Some of the features include:

❶ **Learner Personalization:**

- personalized presentation of current and planned courses.
- customization of the interface for groups or individual users.
- bookmarking of courses and resources.
- course and resource recommendations based on user profile.

❷ **Organization Personalization:**

- logos.
- colors.
- feature display options.
- internal "marketing/ communication" pages.

❸ **Online Help**

Hosted Solutions

TAs may implement a fully hosted LMS or develop and deploy the software on their own.

A company that implements a fully hosted LMS solution does not own

or manage the hardware and software required to run the learning system. The company contracts for the development and management of the software with an external party. The industry term for vendors that manage this outsourced hardware and software is "Application Service Providers" (ASPs).

On the other hand, companies may choose to license and implement the software on their own.

Hosted Solutions: Pros and Cons

Hosted solutions offer several benefits to organizations:

❶ **Lower Cost:** The organization does not need to invest in hardware or software licenses. It does not require internal technical support or development.

❷ **Faster Implementation:** Avoiding the hardware and software set up reduces the overall time required to rollout the functionality.

❸ **Continuous Updates:** The organization does not need to update the software. If the LMS/ASP also manages content, there is a significant reduction in the efforts to keep this content up-to-date.

With certain LMS systems, there may also be disadvantages, although many of these have dissipated over the past couple of years.

❶ **Customization.** Typically, corporations have more flexibility to customize the application, although hosted solutions are increasingly "configurable."

❷ **Security.** Some organizations wish to deploy their learning system inside the firewall to reduce perceived security threats. Again, hosted solutions are increasingly able to ensure security.

❸ **Bandwidth.** Although this has been an issue, bandwidth constraints are increasingly on corporate networks, not on the general Internet backbone.

In deciding to adopt a hosted or an internal solution, organizations need to evaluate how users, both TAs and students, access the system. Some LMS solutions require client downloads while others offer 100% access through the omnipresent browser.

Hosting Features

In evaluating hosted LMS alternatives, the TA should consider:

❶ Proven stability.

❷ Guaranteed availability (Service Level Agreements).

Integration Considerations

It's unlikely that many users of a LMS will want an eLearning environment that is completely separate from the applications and data systems that are already present at their company. Generally, the LMS needs to be integrated into existing application interfaces as well as to share the data it retains on students. Additionally, many companies have unique business requirements and will require that the LMS be modified to support these requirements.

TAs need to address issues of integration before deployment. Indeed, the question of integration provides TAs with an important criterion for LMS selection and deployment.

Integration can occur in a number of ways: customization, application interfaces, and data feeds and extracts.

Customization

Customization involves the process of tailoring the LMS to meet specific company requirements. These requirements can range from simple user interface changes, requiring graphics and color enhancements, to the full development of specific and unique business process needs. These customization areas include:

User Interfaces Changes. A LMS needs to support user interface enhancements and allow the company to update the LMS's look and feel. These changes will range from putting the company logo on the screen to more complicated graphical changes in which a branded university is developed.

Custom Fields. The LMS must support the capability of adding custom fields that can be used to track additional information about students. This information should be included in any exports or reports generated by the LMS.

Reporting. Custom reporting capabilities are key. Additionally, these reports must be capable of producing output in several formats as well as exporting data to different file types.

Application Interfaces

In order to function seamlessly, the LMS must be able to integrate within the application framework already in place at a company. Many companies have significant investments in HR systems and other Third Party applications that are already used by students to record course attendance and proficiency levels. The ability to integrate the LMS into these environments seamlessly is key to successful deployment. There are several forms of application integration that must be supplied by a LMS. These are:

Third Party Integration. The LMS needs to be flexible and to support Third Party application, integration as well as allow for add-on integration with search engines, online books, commerce engines, and other features. The goal is to be able to provide the student with a rich learning environment that is fresh and stimulating. Integration with third party products will be key.

Single Login. Many HR systems allow the employee to login and view benefits, salary, training, and other information. It should also link directly to the LMS and not require the employee to login as a student again.

User Interface Flow. Two issues are important to a successful LMS deployment: ease of student use and ability to customize user interface and

integrate within the framework offered by Third Party applications. The students shouldn't feel that they are bouncing between distinct and separate applications.

Data Integration

The key to a successful LMS implementation is the ability to get information into and out of the LMS. There are several forms of application integration that will be necessary for an LMS to support. These are:

Student Registration. As new employees are hired and registered in a company's HR systems, the LMS needs to have a new student created automatically and linked to the new employee record in the HR system. Likewise, when an employee leaves the company, the student ID and any training records should be deleted. Therefore, the LMS must support the ability to register students via information exchanges with Third Party applications.

Data Exports. Training data stored in the LMS must be made available to the HR systems and other Third Party applications. The LMS needs to be capable of both real time and batch interfaces to share this data.

Data Imports. Importing data into the LMS is also important. Imports include student information for initial enrollment as well as skills and development plans.

Security

Overview

In any data system containing employee information and proprietary content, security is a priority. The LMS must adequately protect data from misuse.

Client Needs

Organizations spend millions of dollars to protect employee data and proprietary content. In selecting a LMS, especially a hosted LMS which contains employee data and possibly proprietary training content, the decision maker must consider the security of the system. A security breach not only puts sensitive data at risk, but it could be an embarrassment to the IT department.

Security measures usually include passwords and encryption:

- Password security provides users with unique IDs and passwords. To be effective, IDs and passwords must be secure and distribution of the ID must be secure.
- Encryption keys are codes that both the sender and receiver must have in order to communicate. The encryption key reduces the risk of a third party intercepting sensitive information. Most browsers employ Secure Socket Layers (SSL) to provide encryption. SSL is the de facto standard for secure exchange of information over the Internet.

Features

Some of the features needed for security are:

❶ **Access controls to employee data:**

- administrative restrictions.
- user authentication.

❷ **Access control to proprietary content:**

- administrative restrictions, user authentication.
- content placement inside corporate firewall.
- IP address restrictions.
- activity logs.

❸ **Use of encryption.**

2: The Element K Online Learning Solution

The Element K online learning service, elementk.com, offers customers a comprehensive and fully-hosted Learning Management System that is integrated with online courses and services.

Hundreds of companies have managed thousands of learners on this LMS platform since Element K launched its first product in 1996, LearnItOnline.com. Today, the Element K LMS continues to support clients with a wide range of student management, course management, assessment, and personalization functionality — fully integrated with the Element K content and services.

The Element K online learning solution includes three primary components:

- Online Courses and Content
- Experience/Services
- Learning Management System (LMS)

Online Courses and Content

Broad Coverage

In addition to leading LMS functionality, Element K offers over 800 high quality, instructionally-sound online courses covering a wide range of technology and business topics.

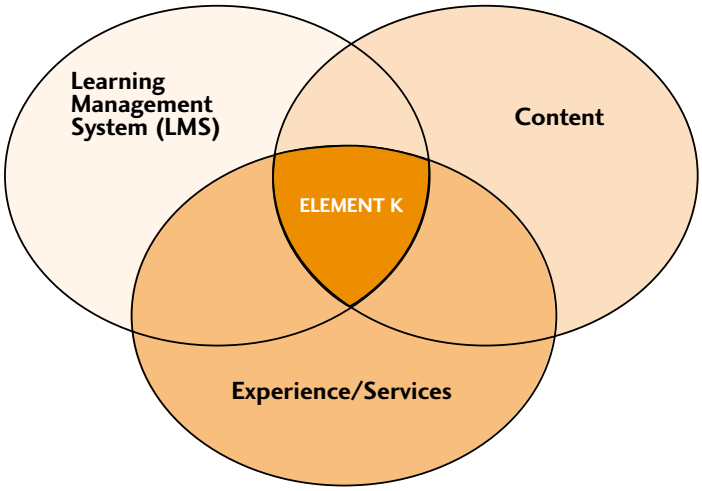
- **Office Productivity Courses:** Includes topics such as Microsoft Office, Lotus Notes, and Netscape Navigator.
- **Design and Media:** Includes topics such as Adobe Photoshop and Macromedia Flash.
- **Programming and Web Development:** Includes topics such as Visual Basic, Java, and XML.
- **Hardware, Networking, and Operating Systems:** Includes

complete support for Microsoft Networking (MCSE), Novell (CNE), Linux, CompTIA's A+, Internet +, and Network +.

- **Databases:** Includes topics such as Oracle DBA and Developer and Microsoft SQL Server.
- **Cisco and Telephony:** Includes CISCO CCNA and telephony topics such as ATM, Frame Relay, and DSL.
- **Business Skills:** Includes topics such as leadership, management, and basic business skills. Offered in partnership with Harvard Business School Publishing.
- **Workplace Safety:** Includes topics supporting a wide range of OSHA compliance issues such as electrical and fire safety. Offered in partnership with Vivid Concepts.
- **Project Management:** Includes topics leading to the Project Management Institute's PMP certification.
- **E-Business:** Includes topics to introduce learners to the world of online business and e-commerce.

Multiple Modalities

❶ **Self-Paced:** Self-paced learning offers users an engaging and instructionally sound way to learn on their own. Element K self-paced courses are built for Web-delivery, using Shockwave technology to provide users with high levels of interactivity. Some of our self-paced courses have labs, quizzes, concept builders, and other activities designed to keep the learner actively engaged in the learning process. Other courses have simulations that bring the software application alive to the learner. Learners interact with the simulated software application as they would in the actual computer application. The course allows them the option of performing the activities themselves or having the system instruct them.



❷ **Instructor-led courses:** The instructor-led courses on www.elementk.com provide students with a virtual classroom experience, including structured course lessons, class activities, practice exercises, and even homework. Each individual has an opportunity to learn not only from his or her instructor, but from the other students in the class.

- **Asynchronous instructor-led courses** take place in threaded message boards. Instructors, who are subject matter experts, provide instruction by posting lessons, assignments, quizzes, and labs on the message boards. Students read the posted materials and respond to the messages. As the class progresses, peer-to-peer learning takes place as well as mentoring by the instructor. A textbook is usually required in these courses, and instructors provide additional materials as needed.
- **Synchronous instructor-led training** allows live interactive instruction over the Internet. Training events are scheduled, and users and instructors meet online at the designated time. Element K uses Centra's Symposium and Conference software to deliver live training. Instructors use this medium primarily to perform demonstrations, hold office hours, and provide live mentoring.

❸ **Reference Library (Knowledge Base):** Element K offers searchable access to over 500 technical reference trade books through a partnership with Books24x7.com. Learners may search a wide range of topics and view the full-text version of textbooks, manuals, journals, and other publications. These electronic versions are complete with graphics, tables, glossaries, and illustrations. Students have the ability to bookmark important pages within the books and return to them again and again as they work through their studies.

❹ **Virtual Labs:** Element K provides students access to virtual labs through the Internet for topics including Cisco and Microsoft Client/Server technology. Powered by Mentor Labs, these sessions allow the student to complete an actual hands-on exercise to build on classroom learning. Students are able to complement their training with realtime access to live telecommunications equipment through the Internet. This feature allows students to reserve time on the

equipment to practice their new skills in configuring router, switches, and telecommunications networks. Students wishing to pursue Cisco Certifications will find this service invaluable. After the lab work, each student gets an opportunity to record debriefing notes and archive results for future reference.

Instructional Design

Element K has been teaching adults how to use technology for over 18 years, longer than all major eLearning providers.

As the pioneer of online learning, Element K is the only company to offer a learning methodology based on experience with real students. Our profound understanding of how adults learn led us to develop instructional design methods that set the benchmark for eLearning.

The Element K learning experience provides the keys to learners so that they can unlock knowledge.

Our approach is based on these values for student success:

❶ **Learner-Centered:** Learners are in control of their learning experience. They make informed decisions about what and how to learn based on their needs and learning styles.

❷ **Engaging:** Element K achieves the maximum level of learner commitment by immersing the learner in the experience. The design establishes relevance, builds learner confidence, and challenges learners with realistic problems and solutions that they can take back to the workplace.

❸ **Interactive:** Learners experience the highest level of meaningful interaction.

❹ **Media Supports Methods:** Element K wasn't "born on the Web"! Rather, we consider the learners' needs first and then determine the appropriate instructional methods. We then use media to effectively and efficiently support the methods and support learners.

❺ **Organized:** Content is organized and structured so that learners can efficiently remember and transfer what they have learned. Element K's instructional design has been proven to be one of the most effective ways to learn and retain information. Element K applies this design across all media: in our sophisticated courseware, which is consistent with the way people learn; in our online formats, which are designed for ease of use and retention; and in our instructors, who know how to apply learning to real-world problems.

Standards Compliant

Element K supports the emerging standards for interoperability between learning objects and learning management systems. Element K products are designed and developed with these standards in mind:

- **AICC:** Element K learning objects are designed to AICC guidelines (AGR-006/AGR-010).
- **IMS:** Element K is a member of the IMS Developer Network and is participating in creating and using IMS compliant materials.
- **SCORM:** Element K is participating in the development and adoption of the standards, and intends to certify all learning objects when the standards are finalized and certification becomes available.
- **IEEE P1484:** Element K is a member of the IEEE Standards Association and is participating in the development of the standards. Element K intends to certify all learning objects when the standards are finalized and certification becomes available.

Experience/Services

In addition to leading content and LMS functionality, the Element K online education solution includes several services which help create a unique experience.

Instructors: Approximately 60 courses covering a wide range of topics run each month on elementk.com. Recognized experts in each field lead our instructor-led courses and Q&A forums.

Mentors: Students have the ability to ask questions of subject matter experts as they progress through their training. Questions can be asked via a threaded message boards or via 1:1 email with a mentor.

Technical Support: Element K offers the most comprehensive technical and customer support available. Individual students may contact Element K using 24 x 7 live chat, email, and the phone. Students may view all support cases online through the Element K CRM system.

Participation Development: Element K supports the TA with collateral and support programs aimed at communicating the availability and features of elementk.com. Collateral material includes roll-out kits, posters, learner ID cards, PowerPoint presentations, and an administrator user documentation. Monthly e-newsletters keep students and administrators aware of feature enhancements and new course offerings. As a continuous learning service, Element K will help individuals learn how to learn. Student use is tracked to proactively address organizational needs in order to maximize learning.

Professional Services: Element K provides a wide range of professional services to support an organization's eLearning needs, including conversion of content to online courses, systems integration, and site customization.

Learning Management System (LMS)

Today, Element K offers a significant amount of LMS functionality as part of its online service.

Student Management

The Element K LMS provides valuable student management functionality. Administrators have multiple options for creating and distributing student access rights. They may manually set up students, import student records, or distribute enrollment keys to an organization allowing students to self-register.

Administrators can also communicate to selected students or student groups using an integrated email system. An important feature of the Element K administrative functionality is the ability to manage students by department, location, or job responsibility.

Reporting

Administrators also have access to many standard reports. Reports can be viewed online in summary or in detail, or exported for use in another application.

Course Attendance

Administrators may generate a report that displays all of the information for selected student course attendance. Reports can be oriented by course or by student, can include all or some of the course types, and can relate to a specified date range.

Assessment Activity

Administrators may generate a report that displays assessment activity on this site. The TA can also view student scores, compare baseline and follow-up assessment results, and track student progress and improvement.

Site Activity

Administrators may generate a report that shows student activity on this site. This report can be oriented by contract or group, in either detail or summary format, and can be exported for use in another application.

CEU Credits

Administrators may generate a report that shows CEU credits earned for all students or selected students.

Training Administrator

The organization also has the option to set up multiple training administrators. Administrators may assign rights, edit rights, and correspond with other training administrators.

Site Management

Administrators have multiple options to manage the site, including uploading their corporate logo to the student site and distributing announcements.

3: Element K KnowledgeHub™

Overview

Over the past year, the number of Element K paid online subscribers has grown significantly. We have added multiple co-branded sites, and we have significantly enhanced functionality. Because of this rapid growth, we have learned much about our existing architecture. Element K has addressed two issues: the need to build a product that would support long-term growth, and the need to evaluate the major LMS vendors.

This process of evaluation has resulted in Element K co-developing a LMS platform with ISOPIA. The result is Element K KnowledgeHub.™ This new platform will leverage the benefits of ISOPIA's iLMS architecture and functionality with the existing functionality of elementk.com and our four years of experience in managing a hosted learning site. Element K will also co-develop significant additional functionality.

We selected ISOPIA because of their product's underlying architecture, which is scalable, flexible, and extensible. ISOPIA's iLMS product uses a true 3-tier architecture, separating the database, business logic, and presentation layers. This separation provides flexibility and extensibility. In addition, we felt strongly that the technologies chosen by ISOPIA were the best available for implementing Internet-based solutions, providing the scalability necessary for our site.

Scalability: The component-based architecture allows nearly unlimited scalability, allowing us to support our continued growth by adding users to the system without diminishing performance.

Flexibility: This architecture allows us to easily support our co-branded sites for Gateway, Micron PC, Microsoft, and Macromedia, and allows our corporate users to create sites with their own look and feel. The gains in flexibility from the separate presentation layer also mean that more dynamic and customized content will be displayed to the user, eliminating the information dump of more static HTML pages.

Extensibility: We will continue to integrate functions and features into our service offering, improving the overall student experience. This system will continue to support the existing favorites like Books24x7 and journal articles, as well as many new ones, such as Virtual Labs (vLabs), BrainBench assessment service, certification tests, Customer Relationship Management, Downloadable Courses, Proprietary Learning Objects, eBooks, Mentoring 1:1 and 1:m, expanded Self-Serve Purchasing (SSP), and others.

Element K will also implement significant additional functionality, including the ability for our users to manage their off-line courses and resources, improved student and course management functionality, the integration of synchronous training, and support for individual purchase of classes and learning events.

Architecture

KnowledgeHub is built using a true 3-tier architecture, separating the database, business logic, and presentation layers.

Flexibility

Separating the presentation and business layer allows us to develop completely personalized sites while still offering the full Element K functionality.

Extensibility

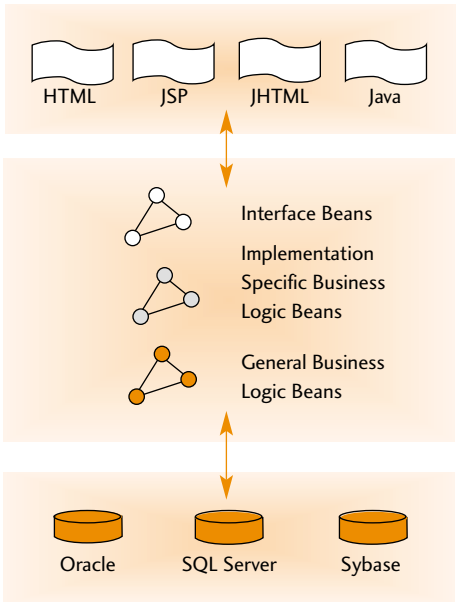
It enables us to rapidly offer functional enhancements to our product, thus keeping up with the demands of the market.

Using current Internet technology instead of the legacy client server that many other LMSs employ, Element K will enable future integration with other vendors.

Scalability

Given our rapid growth, we needed an architecture that could scale to millions of users.

Architecture chart



Tier 1
Presentation Layer

Tier 2
Application and Business Logic Layer

Tier 3
Data Store Layer

Features

Student Management and Reporting

KnowledgeHub provides administrators with a complete set of functionality to manage students. Administrators may create and distribute student rights through manual entry, batch import, and distribution of enrollment keys.

Administrators can also create multiple administrators with individualized user rights; the TA may also create unique student groups, assigning those groups to the administrators.

KnowledgeHub also provides administrators with multiple ways to communicate with their students. Administrators may create and distribute messages within the site for student groups, or they may also distribute messages by student or student group through email.

In this way, the management for learning activities is simplified for a group of students, eliminating the arduous task of keying in a list of names for every material change in their access.

Reporting on student activity is extensive. Reports provide insight about site, course, and student activity. Administrators can report using custom fields.

Learning Event and Resource Management and Reporting

KnowledgeHub provides a comprehensive set of learning event and resource management tools.

The administrator can add or modify any learning object or event in the course catalog, including the addition of self-paced courses, of online, or offline ILT courses and classes. The administrator can set up a course syllabus; establish prerequisites and required courses. In the course display, the administrator may present class dates, times, and locations.

Within the course catalog, the learner may search by course name, code, subject, location, skill, certification, or delivery modality.

The TA may also manage course access and distribution. Specifically, the TA may restrict access to courses by student group, location, or job. In addition, administrators may restrict access to those students who require manager notification or approval.

KnowledgeHub also provides complete support for learner resource management, including a database to keep track of classrooms, instructors, and equipment. The administrator may easily view resources and schedules and assign resources to specific learning events.

KnowledgeHub also provides complete class/event registration management. Learning events may be scheduled, with multiple registration options, capacity designation, and wait lists maintained.

Finally, KnowledgeHub provides comprehensive and flexible reporting options on learning event activity. The administrator may run reports on attendance and utilization, pre- and post-assessment results, track individual course time and pages, or track ILT course attendance.

Online Course Delivery Infrastructure

KnowledgeHub includes integrated virtual classrooms that host both asynchronous (message board type) communication and synchronous (for example Centra) communication.

Administrators may set up an asynchronous course, create and view a syllabus, open the course for registration, and run the course on the LMS platform. Similarly, the administrator may set up synchronous events, manage registrations, and run the event on the LMS platform.

Course Authoring Tools

KnowledgeHub allows administrators to upload Third Party learning objects, add to the product catalog, and support student access. File support includes Shockwave, Flash, Java, HTML, video files, and more. Completion and bookmarking are also possible for courses that are compliant with the AICC or emerging SCORM standards.

Planned upgrades of KnowledgeHub will also provide an integrated, self-paced course authoring system that will allow an instructor to author and publish courses in a shortened format.

Skill/Competency Assessment

KnowledgeHub will allow administrators to create and edit assessment questions, associate these assessments with specific learning objects, and distribute to their students. The LMS supports the SCORM/IMS question types, including multiple choice, multiple select, hotspot, true/false, and match.

Assessment results may be used to create a personalized learning path.

Administrators may report on pre- and post-assessment results.

Professional Development Management

KnowledgeHub supports management of job roles and development paths. The administrator may create and edit job roles and the associated development paths, or view a database of standard job roles and development paths.

The administrators and students may then view and evaluate their knowledge/skills against these predefined roles and development paths and create personalized learning plans.

The administrator and the learner can view each individual's job roles, and course and skill accomplishments.

Knowledge Bases

KnowledgeHub includes access to the Element K technical library knowledge base, providing access to hundreds of technical reference books from leading publishers through a partnership with Books24x7. The Element K technical reference library also includes a complete selection of timely "how to" articles from Element K journals, offering practical tips, techniques, and technical briefings.

In the KnowledgeHub, Element K plans to integrate additional knowledge base functionality, allowing users to link additional external knowledge bases as well as to use integrated knowledge base technology to tag, store, and retrieve various types of information.

Learner-Centric Personalization

KnowledgeHub will provide a learner-centric interface.

The learner may view active courses, bookmark courses, and reference material for quick access in the future.

Based on the learner's profile, Element K will highlight special interest materials, courses, and reference books that are likely to be relevant.

4: Summary of Existing and Planned Element K KnowledgeHub Features

	LMS Feature	Element K LMS	Element K KnowledgeHub	Element K KnowledgeHub (Planned Upgrade)
Student Management and Reporting	**1) Creation and distribution of student access rights**			
	a) Administrator may import student data for batch site registration.	Yes	Yes	Yes
	b) Administrator may manually set up a student.	Yes	Yes	Yes
	c) Administrator may distribute user identification and passwords via email.	Yes	Yes	Yes
	d) Administrator may distribute enrollment keys to allow students to self-register.	Yes	Yes	Yes
	e) Administrator may allow anonymous browsing of catalog, with site registration upon course selection.	No	No	Yes
	2) Support for distributed training administrator functionality			
	a) Administrator may set up multiple training administrators with specific user rights to manage students, content, and messaging.	Yes	Yes	Yes
	b) Administrator may create and manage student groups.	Limited	Yes	Yes
	c) Administrator may assign training administrators to students and student groups.	Yes	Yes	Yes
	3) Comprehensive reporting			
	a) Standard reports showing site, course, and student activity.	Yes	Yes	Yes
	b) Custom student record fields on which to run reports.	Yes	Yes	Yes
	c) Custom reporting functionality.	Limited	Yes	Yes
	d) Charge back capabilities.	Limited	Yes	Yes
	4) Messaging			
	a) Training administrator may create and distribute messages within the site for student groups.	Yes	Yes	Yes
	b) Training administrator may distribute messages by student or student group through email.	Yes	Yes	Yes

	LMS Feature	Element K LMS	Element K KnowledgeHub	Element K KnowledgeHub (Planned Upgrade)
Learning Event and Resource Management and Reporting	**5) Course Access Rights and Distribution**			
	a) Administrator may restrict access to courses based on student group, location, job, etc.	Limited	Yes	Yes
	b) Administrator may support manager notification and/or request for approval.	No	No	Yes
	c) Administrator may control course display in course catalog hierarchy.	Yes	Yes	Yes
	d) Administrator may display course as recommended or required.	No	Yes	Yes
	e) Administrator may enforce course prerequisites.	No	No	Yes
	f) Administrator may prioritize course access and wait list sequence based on payment type, group priority, etc.	No	No	Yes
	6) ILT Course Resource Management			
	a) Administrator can maintain a database of resources, including classrooms, instructors, and equipment.	No	Yes	Yes
	b) Administrator may assign/schedule resources to specific classes.	No	Yes	Yes
	c) The administrator may easily view and manage schedules for any resource.	No	Yes	Yes
	7) Class/Event Registration Management			
	a) The training administrator may schedule multiple instances of a single course (class).	No	Yes	Yes
	b) The training administrator may enable course registrations and capacity.	No	Yes	Yes
	c) The administrator may notify students of changes in course status.	No	Yes	Yes
	d) The administrator may "bulk" register a group of students.	No	No	Yes
	e) Administrator may restrict which courses are eligible for registration cancellation.	No	No	Yes
	f) Administrator or learner may initiate cancellation or registration.	No	Yes	Yes
	8) Reporting			
	a) The administrator may run reports on course attendance or utilization.	Yes	Yes	Yes
	b) The administrator may run reports on pre- and post-assessment results.	Yes	Yes	Yes
	c) The administrator may create custom reports on courses, classes, or resources.	Limited	Yes	Yes
	d) Tracking of multimedia self-paced courseware (by time or pages).	Limited	Yes	Yes
	e) Tracking of multimedia of virtual classrooms (by time, attendance, or pages).	Limited	Yes	Yes
	f) Learner evaluation systems for courses.	Limited	No	Yes

	LMS Feature	Element K LMS	Element K KnowledgeHub	Element K KnowledgeHub (Planned Upgrade)
Online Course Delivery Infrastructure	**9)Native support for online instructor-led courses through message boards**			
	a) The ability to set up a new course.	No	Yes	Yes
	b) The ability to create and allow viewing of course syllabus.	No	Yes	Yes
	c) The ability to open a course for registrations.	No	Yes	Yes
	d) Infrastructure to support course delivery.	Yes	Yes	Yes
	10) Native support for online synchronous events			
	a) The ability to set up a new course.	No	Yes	Yes
	b) The ability to create and allow viewing of course syllabus.	No	Yes	Yes
	c) The ability to open a course for registrations.	No	Yes	Yes
	d) Infrastructure to support course delivery.	Yes	Yes	Yes
	e) The ability to distribute necessary client software.	Yes	Yes	Yes
Course Authoring	**11) Third Party learning object support (self paced courses)**			
	a) Capability to launch and deliver learning objects.	No	Yes	Yes
	b) Support for Shockwave, Flash, Java, HTML, and Video files.	No	Yes	Yes
	c) Completion Tracking and Bookmarking.	Yes	Yes	Yes
	d) Compliance with AICC, IMS, and SCORM standards.	Yes	Yes	Yes
	e) Administrator self-service course loading.	Yes	Yes	Yes
	12) Self-Paced course authoring			
	a) Integrated self-paced course authoring.	No	No	Yes
	b) Database-driven, dynamically-created content presentation.	No	No	Yes
	c) Presentation flexibility.	No	No	Yes
	13) Asynchronous Instructor-led course authoring			
	a) Templates for course syllabus.	No	Yes	Yes
	14) Synchronous Instructor-led course authoring			
	a) Templates for course syllabus.	No	Yes	Yes
Skill/Competency Assessment	**15) Create and edit assessments**			
	a) The ability to create or edit an assessment question.	No	Yes	Yes
	b) The ability to associate the assessment question with a specific learning object or event.	No	Yes	Yes
	c) Support multiple question types, including multiple choice, true/false, multiple select, etc.	Yes	Yes	Yes
	16) Distribute and deliver assessment tests			
	a) Create and deliver assessment tests by job role.	No	Yes	Yes
	b) Create and deliver assessment tests by function.	No	No	Yes
	c) Create and deliver assessment tests by course.	No	Yes	Yes
	d) Delivery of assessment tests.	Yes	Yes	Yes
	17) Create a personalized path from assessment results			
	a) System-generated recommendations or learning path based on assessment results.	Yes	Yes	Yes
	18) Report on assessment results			
	a) Report on which students have taken assessment tests.	Yes	Yes	Yes
	b) Report on results of assessment tests.	Yes	Yes	Yes
	c) Report comparing pre- and post-assessment results.	Yes	Yes	Yes

	LMS Feature	Element K LMS	Element K KnowledgeHub	Element K KnowledgeHub (Planned Upgrade)
Professional Development	**19) Job roles and development paths**			
	a) Create and edit job roles (and profiles).	No	Yes	Yes
	b) Create and edit multiple career paths.	No	Yes	Yes
	c) Create and edit development paths and associate development paths with roles.	No	Yes	Yes
	d) The ability to link to off-the-shelf skills dictionaries.	No	No	Yes
	e) The ability to generate student skill profiles, including 360 reviews, off-the-shelf assessments, and self-definition.	No	No	Yes
	20) Tasks			
	a) Create and edit tasks.	No	No	Yes
	b) Associate tasks and knowledge need to complete the task with job functions.	No	No	Yes
	c) The ability for students/administrators to view and evaluate their knowledge/skill set against pre-defined job/position profiles.	No	Yes	Yes
	21) Reporting			
	a) Report on knowledge/skill inventory by individual.	No	Yes	Yes
	b) Report on job roles.	No	Yes	Yes

5: The Element K Unique LMS Solution

KnowledgeHub is an important part of the Element K unique eLearning solution.

Blended Solution Support

KnowledgeHub provides learning support for both online and offline learning. Recognizing that learning programs usually include both online components as well as offline components, Element K provides the tools to manage this blended environment.

Continuous Learning

Learning is not event driven. It is a continuous process. While learning events will remain a part of this process, learning occurs continuously. Element K supports continuous learning by providing learners options. Learners may take 5 minutes each week to review new "how to" articles which offer fresh insight into new tools and techniques related to their job. If a programmer runs into a specific coding issue in the course of doing her job, she may search and retrieve an answer in a matter of minutes with the Element K large reference database that includes over 500 books. Finally, learners can always use the Element K instructionally sound courses to learn new skills to support existing and new job roles.

A Personalized Experience

Each learner is an individual. Learners learn differently and acquire knowledge at different rates. Each learner has a different background and specific skill gaps. Element K recognizes that each learner is unique and provides multiple learning modalities: self-paced materials, instructor-led courses, and even reference materials for the competent person that requires very specific knowledge. Element K also offers assessment tests that allow the learner to create a unique learning path which focuses solely on the learner's skill gaps.

Professional Development Support

KnowledgeHub allows the administrator to define and edit job roles, job functions, and competencies. The administrator may establish learning paths for any job role and create assessments. Element K also supplies predetermined job roles, functions, and tasks to aid in this area.

Our Integrated Solution Makes it Easy

Element K provides the infrastructure. Element K provides the virtual asynchronous and synchronous classrooms. Element K provides the courses and the instructors. Element K provides the technical support. Element K provides the learning management tools. Element K allows you to easily integrate off-the-shelf training with proprietary training. No other solution makes it this easy.