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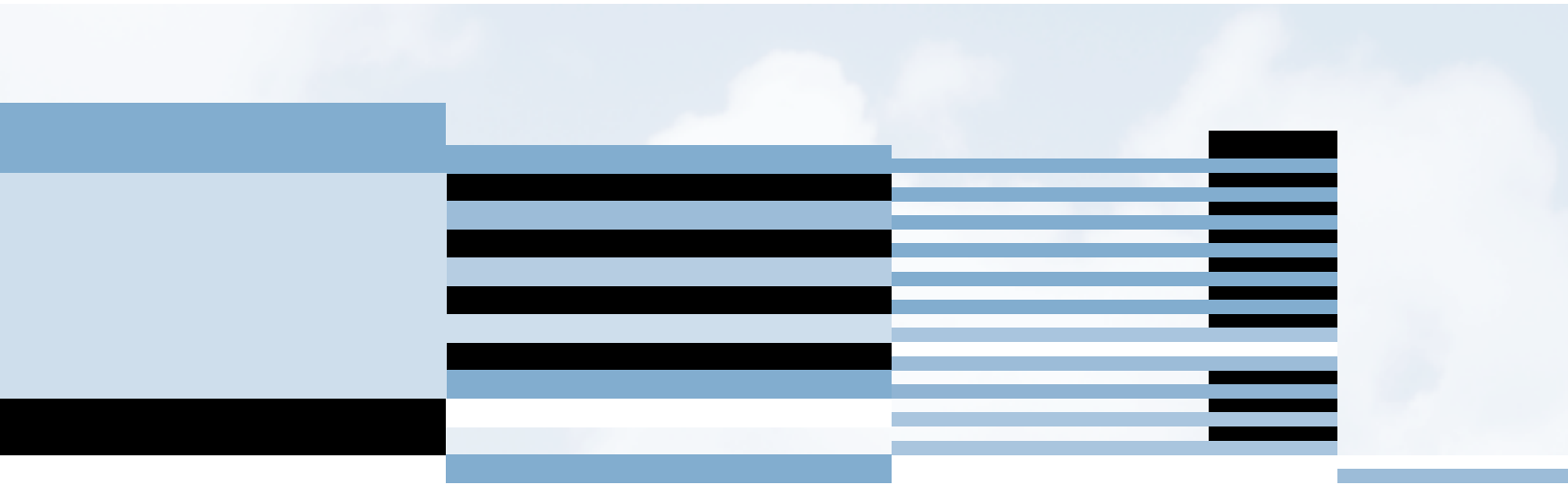

LearningSpace 4.0 White Paper

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IBM

Lotus

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Overview

Lotus LearningSpace 4.0 is a complete and flexible e-learning platform. It provides an online environment for unparalleled support of all three delivery modes of e-learning — self-directed, asynchronous collaboration, and "virtual classroom" learning.

LearningSpace 4.0 is for enterprises that recognize the need to build e-learning into their business plans:

- To reach employees, suppliers, partners and customers wherever they are, whenever they're ready, within their own "communities of practice."
- To provide learning experiences in whatever mode best suits the material and the students — self-directed, collaborative, or real-time.
- To create an efficient, effective structure for learning within the enterprise, with the tracking and management capabilities that a well-run organization requires.

LearningSpace 4.0 features provide not only the most flexible learning experience for students, but the broadest support for curriculum planners, instructors and administrators. Course designers and instructors can create materials using a variety of tools or integrate existing materials from a variety of sources. Administrators can manage learners conveniently by assigning them to profiles, tracking student activity, and generating reports that let them evaluate student progress and the effectiveness of their learning programs.

A best-of-breed integrated combination

LearningSpace 4.0 combines the robust self-directed delivery and industry-leading tracking and management capabilities of Pathware (acquired by Lotus from Macromedia in 1999), with the unique collaborative learning experiences refined in the three previous versions of Lotus LearningSpace. No other e-learning system has the breadth and flexibility of the LearningSpace platform. The combination provides key capabilities in the areas of management, course delivery and tracking.

LearningSpace 4.0 customers have two product choices:

- The LearningSpace Core module — supports delivery, tracking and management of online self-directed learning, and provides the infrastructure to manage learning initiatives of any size, from a departmental program to an enterprise-wide corporate university.
- The LearningSpace Collaboration module — combines all the administrative and self-directed learning features of the Core module with the collaborative learning experiences of discussions, live virtual classrooms and Sametime awareness for collaborative learning that can draw in audiences from anywhere in the world in real time.

LearningSpace 4.0 is designed to provide the flexibility that the enterprise requires — to be a unified, standard platform for the delivery of all the corporation's learning initiatives, from generic standards-based training materials to customized programs in support of strategic business initiatives. To deliver this flexibility, LearningSpace 4.0 supports a wide variety of existing course content and tools for course authoring.

LearningSpace 4.0 is designed to be scalable. It can be installed on a single server to meet the needs of a departmental training initiative; or it can be installed in multi-server configurations to provide the "corporate university" infrastructure for an entire enterprise's e-learning solution.

Most importantly, LearningSpace 4.0 is the technology centerpiece of the IBM Mindspan Solutions group, a worldwide organization which combines this best-of-breed platform with unparalleled experience in providing services to plan curriculum, create courses, and deliver comprehensive end-to-end solutions for the learning needs of the enterprise.

Learning at Web speed

In today's fast-moving economy, learning has become a strategic asset to the competitiveness of the enterprise. Learning is moving out of training rooms and onto the Internet as corporations turn to e-learning to meet their needs for delivering effective learning. However, they face many challenges:

- Learning must reach employees, business partners and customers who are increasingly decentralized, dispersed to remote sites. To reach its audience, learning must be available whenever the employees are ready to learn, on their schedule. And to be effective, it must involve them in their own "communities of practice," the work groups and peer groups that reinforce learning with collaborative experience.
- The enterprise must provide many types of learning, from the most generic kinds of off-the-shelf training materials (how to use PC software, office safety and human resources courses) to the most mission-critical customized education on the company's products and programs (new product sales training).
- Learning must be manageable. The enterprise must have the solutions it needs to create a structure for designing a curriculum, offering courses, enrolling students, delivering content, and tracking and evaluating the performance of the individual students — and the effectiveness of the learning program as a whole.
- Enterprises must have options for openness in their learning system. No single choice of vendor or system should lock out other options. Enterprise learning programs should be free to mix learning content from many sources. They should be able to deliver content in different learning modes — self-directed courses, collaborative projects, virtual classrooms. They should have "make or buy" choices for custom content. And they should have access to consultants and business partners for learning development.

For the enterprise, the best available platform for building solutions to these challenges is Lotus LearningSpace 4.0.

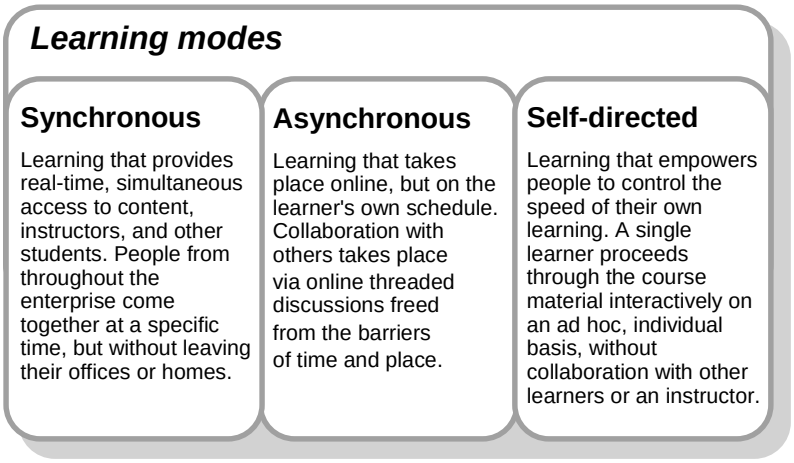
Better learning for everyone

LearningSpace 4.0 features provide not only the most flexible learning experience for students, but the broadest support for curriculum planners, instructors and administrators, as well as the management controls, flexibility and scalability to meet the needs of the enterprise.

Multiple learning modes

The two LearningSpace modules — LearningSpace Core and LearningSpace Collaboration — provide support for the three delivery modes for online learning experiences. LearningSpace Core supports self-directed study. LearningSpace Collaboration includes the collaborative elements of the award-winning Lotus products Domino and Sametime to support asynchronous collaboration through online discussions and access to shared materials, as well as real-time "virtual classroom" sessions:

- **Self-directed.** The LearningSpace Core module provides robust functionality for delivering self-directed courses with tracking and assessment. These courses can easily incorporate content from any Web-based source or CD-ROM. LearningSpace Core can deliver and track any AICC-compatible off-the-shelf courseware as well. Self-directed courses can be highly structured with controlled paths and prerequisite assessments, or provide flexible learner access to suit individual learning needs.
- **Asynchronous.** The asynchronous collaboration functionality in LearningSpace Collaboration provides support for discussions and project teams, with access to class materials, exercises, and assessments. It is especially useful for problem-solving exercises, a forum for questions and discussions initiated by learners, and for reinforcing learning done through self-directed study and real-time classes.
- **Virtual classroom.** LearningSpace 4.0 creates a rich virtual classroom environment for real-time sessions with audio and video, shared whiteboards, shared applications, electronic hand-raising, a participant list, private messages, and chat functionality. In LearningSpace 4.0, real-time sessions become activities in the curriculum that can be integrated with the AICC-compatible tracking and assessment functionality



LearningSpace Collaboration allows organizations to enhance self-directed and asynchronous courses by creating opportunities for communication between students and teachers. A discussion can be created to augment any course. Instructors can use the chat functionality to maintain online office hours. These collaborative capabilities allow learners to work with each other to learn from their colleagues and instructors.

Asynchronously, learners can add comments and ask questions in the discussion area. Synchronously, learners can have real-time awareness and instant messaging, as well as participate in real-time virtual sessions with an instructor and other learners.

The combination of all three modes of learning in a single platform provides the utmost in flexibility. LearningSpace 4.0 supports the existing courses in use in the enterprise. And it supports the creation of new courses using two or three of the modes to provide the richest e-learning experience.

Structured for management

Both LearningSpace Core and LearningSpace Collaboration deliver a robust and scalable e-learning management system, based on an update to the Pathware product. Using LearningSpace organizations can deploy large-scale learning applications on an enterprise-wide basis.

LearningSpace is built on a modular design that gives users customized access to the system based on assigned profiles and permissions. The structure can be customized to suit a variety of organizations and job roles. The modules are designed with four types of users in mind: learners, instructors, administrators, and course designers.

LearningSpace 4.0 Core modules

Home	Manage system permissions and global settings	System administrator
Courses	Take online courses	Learners
Planner	Manage course curricula	Course designers
Profiles	Manage learner groups and system permissions	Training administrators
Users	Manage system users	Training administrators
Enrollment	Create, maintain course enrollments	Instructors
Results	Edit learner results records	Instructors
Reporter	Generate and add reports	All, based on permissions

LearningSpace 4.0 provides the functionality that makes it easier to manage learning as a corporate resource:

- **Profiles and permissions.** Users can be assigned to profile groups that share a common set of permissions within the system. If a user does not have permission to use a particular module, it will not appear when he or she logs in.
- **Activity tracking.** LearningSpace 4.0 tracks and reports on each activity within a course, including the number of times the student launched the activity, the amount of time spent, status, score, and the learner's current location in the activity.
- **Reporting.** The monitoring system provides built-in reports, including course and user information, usage statistics, and student progress data. Reports can be

customized and new reports created by using Seagate Crystal Reports Professional to extend the built-in reporting capabilities.

- **Extensibility.** LearningSpace 4.0 provides a programmatic interface for integration with other systems. This interface can be used for access to existing user directories and authentication, to automatically register students for courses, and to upload tracking information to HR databases.

The management functions of LearningSpace 4.0 allow learning program administrators to do the following:

- Publish an online catalog of all available courses.
- Automate registration for courses such as new-employee orientations.
- Manage courses and student data for courses across the organization.
- Track and report on individual and group performance.

Support for designers and instructors

LearningSpace 4.0 empowers designers, subject matter experts, and instructors to efficiently create and deliver effective learning. Instructors can use all their preferred teaching aids, from spreadsheets and presentations to video and software applications. In addition, LearningSpace supports tools that make it easy to include existing course materials and create new ones:

- **Course planner.** The Planner module provides curriculum designers with a tool that includes support for prerequisites and branching. LearningSpace 4.0 also supports auto-completion, which can make a learning program more efficient; learners who achieve a minimum score on the pretest for a unit are automatically recorded as having successfully completed it, and allowed to go on to the next unit**.**
- **Off-the-shelf courseware.** LearningSpace Core supports the AICC standard, which also allows the use of off-the-shelf content, including CD-ROMs, from many companies, such as IBM, NETg, and SmartForce.
- **Content creation.** LearningSpace 4.0 supports content created from a wide variety of authoring tools in addition to Lotus Notes. Lotus resells Authoring Tool Suites combining sets of market-leading authoring tools from Macromedia (Authorware, Dreamweaver, Dreamweaver plus CourseBuilder, Shockwave, Director, Flash) that provide the broadest capability and greatest level of integration for self-paced content delivery. Other third-party tools such as Toolbook II are also supported. Content can also be created from standard MS Office and Lotus SmartSuite files, and HTML content can be easily integrated for both self-directed and live delivery.
- **Assessment.** LearningSpace 4.0 includes easy browser-based authoring for creating questions and assessments, including activity pretests and post-tests and final exams. All question types are supported, including yes/no, true/false, matching, fill-in-the-blank, multiple choice (single and multiple answer), open-ended, and drag-and-drop.

Options for the enterprise

LearningSpace 4.0 is the only e-learning platform that keeps open all the enterprise's distributed learning options. Its standards-based approach and support for all learning modes means that content from many vendors and in many formats can be managed, delivered, and tracked within a single environment. Its support for a variety of content formats and creation tools gives the enterprise a "make or buy" choice for its custom curriculum needs.

Most important, LearningSpace 4.0 is supported by the IBM Mindspan Solutions group. With over 3,500 employees in 55 countries dedicated to its learning initiatives, IBM is the world leader in delivering the best in e-learning solutions. IBM delivers the equivalent of over 2.5 million student days each year, and has a curriculum of thousands of courses available worldwide.

With this knowledge and experience, and resources such as LearningSpace 4.0, IBM Mindspan Solutions stands ready to combine the best-of-breed LearningSpace 4.0 platform with its unparalleled experience in providing services to plan curriculum, create courses, and deliver comprehensive end-to-end solutions to help transform any enterprise into a learning organization.

The LearningSpace architecture

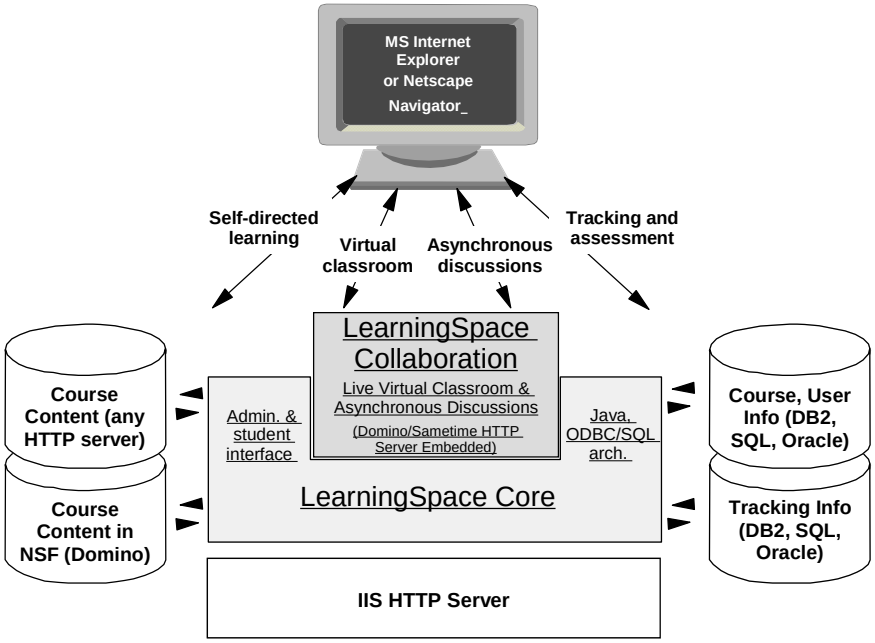
LearningSpace 4.0 is an open, Web-based environment built on familiar enterprise technologies that make it flexible and scalable.

Management information (course descriptions and schedules, assignments, enrollment records) and student information (status, tracking and assessment records) is stored in a relational database (either DB2, Oracle or SQL). Using a standard RDBMS allows for a variety of platform options, flexible reporting, and easy ODBC access to all the data in the system.

Curriculum materials and assignments for self-directed courses can be stored in a file system or database server.

The collaborative delivery features of the product are driven by Lotus Domino and Sametime technology, which are included in the LearningSpace Collaboration Module and run on an NT platform. A Domino and Notes infrastructure is not required. All of the technologies required to utilize the collaboration module are embedded functionality in LearningSpace.

LearningSpace 4.0 can be deployed across one or more servers in configurations that allow for easy scaling. LearningSpace works across intranets and the Internet, and has complete support for corporate firewalls. Below is a diagram of the basic architecture:



The entire system may be installed on one physical server, or spread across several servers. (Separating the content and management databases to different servers is recommended for performance.) Course content may be served from any server on the intranet or Internet the student can access. For high-volume applications multiple servers can be used behind load balancers.

Compatibility

LearningSpace is designed to be both open and compatible. Almost any existing content and many authoring tools from third parties can be used with LearningSpace. Lotus resells Authoring Tool Suites based on Macromedia Web design, multimedia, and authoring tools because they are particularly well suited to creating content for LearningSpace courses. Existing LearningSpace Release 3 courses based on Notes NSF files can be migrated to the LearningSpace Core management structure, and Lotus customers have the option to continue to use Notes clients and NSF files for content authoring and storage.

LearningSpace 4.0 can be customized to suit the enterprise. Logos, graphics and HTML code can be replaced or modified, and the terminology used can be changed to match that used by current training and learning programs.

Standards-based

LearningSpace is designed to support a number of existing standards, and Lotus is continuing its leadership in evolving, setting and supporting new standards in the learning and collaboration arena.

The most mature of the learning standards is the AICC standard for tracking and compatibility between content and the learning platform. The Pathware team helped in the creation of this standard and Pathware was one of the first platforms to support AICC. LearningSpace 4.0 will incorporate this functionality, thus ensuring that the significant quantities of existing AICC-compatible content can be launched and tracked by LearningSpace.

The Collaborative delivery features of the product are driven by Lotus Sametime technology which takes advantage of open standards like H.323 and T.120 to allow real time sharing of information and communication.

H.323 is the ITU-T standard for sending voice (audio) and video using IP on the Internet and within intranets. H.323 is sponsored by the International Multimedia Teleconferencing Consortium (IMTC), a nonprofit corporation consisting of more than 150 companies from around the world.

T.120 was developed by the International Telecommunications Union as a core set of standards for real-time, multipoint communications. The T.120 series has been ratified by more than 100 companies.

In addition, Lotus and IBM are working to address the emerging standards of the IMS (Instructional Management System) project in LearningSpace. The IMS is an open consortium of industry and education members who are focusing on the development of standards for learning objects. Lotus is committed to making LearningSpace “IMS standard conforming.”

Directory integrity

Previous versions of LearningSpace relied on the Domino server directory for user authentication. LearningSpace 4.0 Core can be installed without Domino since it maintains its own directory as part of its SQL management database. For existing Domino customers, a LotusScript agent is provided with LearningSpace Core to populate the SQL directory from a Domino address book. An equivalent agent is provided to populate the Collaboration Domino server address book from the Core directory. Lotus is working to harmonize authentication for both servers through LDAP support.

Integration

LearningSpace 4.0 is designed for easy integration with other enterprise systems. LearningSpace has a documented extensibility architecture based on a Java API. The API can be used to integrate LearningSpace with back-end systems such as HR databases, ERP and e-commerce systems.

Platforms

LearningSpace 4.0 supports the following:

- Windows NT server 4.0 with Option Pack 4 (for single server installs or for the Core Module application server in multiple server configurations)
- DB2 6.1, SQL Server 6.5, or Oracle 7.3 or later (for the database engine)
- Internet Explorer 4.x
- Netscape Navigator 4.x

LearningSpace 4.0 will initially be available in 15 languages: English, French, Italian, Spanish, German, Danish, Simplified Chinese, Traditional Chinese, Korean, Japanese, Brazilian Portuguese, Swedish, Norwegian, Finnish, and Dutch.

Summary

LearningSpace 4.0, supported by the worldwide IBM Mindspan Solutions group, delivers a complete and flexible enterprise learning platform combining the following:

- A flexible, standards-based platform for the delivery of all types of e-learning, from generic standards-based training materials to customized courses.
- A management environment that makes it possible to administer course catalogs and learner populations, track student activity, report on and evaluate student progress and the effectiveness of learning programs.
- Support for the creation, management and delivery of all modes of online learning using a variety of tools, or integrating existing materials from a variety of sources.

LearningSpace 4.0 is scalable to meet organizational needs of any size from a single department to an entire “corporate university.”

LearningSpace 4.0 is the centerpiece of the IBM e-learning practice, which combines this best-of-breed platform with unparalleled experience in providing services to plan curriculum, create courses, and deliver comprehensive end-to-end solutions for the learning needs of the enterprise.

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