OpenDoc™

Making Software Work Together

Background Information
August 1994

Component Integration Laboratories, Inc.
Background Information

Building Tomorrow's Solutions Today

Component software represents a revolutionary transition in the software industry, driven by customers' needs and business issues. Component software offers a new level of computing power and flexibility by promoting: easier manipulation of data and tools for end-users, customizable applications in heterogeneous environments for information systems managers, and greater differentiation and competition for software developers. Several leading companies have banded together to openly develop and promote component software. These companies have pooled their technologies in OpenDoc™, an open architecture for component software.

Providing a Reliable Foundation

The basic technologies for a component software architecture have existed for some time, scattered throughout the industry. These technologies include: dynamic linking, object messaging among components, network-capable scripting and workflow automation, and persistent object storage.

Beginning in the Fall of 1993, leaders in the software industry began discussing the need for a fully open, platform-neutral component software architecture. These leaders agreed that a set of specifications to integrate and build upon existing technology is necessary to achieve such an architecture. The software industry has not had such an agreement. Until now.

Component Integration Laboratories, Inc. (CI Labs) is a non-profit organization founded by Apple Computer, Inc.; IBM Corporation; and Novell Inc.'s WordPerfect Applications Group. CI Labs provides the technological specifications and foundation technology for developing and integrating component software through the OpenDoc architecture.

Paving the Way to Component Software

OpenDoc is a new model for computing, designed to improve the way people use computers, the way enterprises manage information, and the way the computer software industry does business. CI Labs is a new model, too. Collaborating on ideas and sharing actual source code, the sponsor companies are openly developing OpenDoc's component software architecture, even as they compete with one another in the delivery of benefits to customers.

OpenDoc will provide a smooth, incremental transition for component software, protecting customers' and developers' investments in software and training. OpenDoc will migrate today's applications to the operating systems of tomorrow, while allowing today's applications to work together. OpenDoc will provide the industry with the means to build towards the future.

OpenDoc reduces the complexity of today's feature-packed software applications, enabling the creation of interchangeable components of software functionality. OpenDoc will ease the user experience and provide efficient custom solutions in an open and competitive market.

Benefiting the User

Users want ways to create content-rich collaborative documents. They need to work quickly and efficiently, and have the flexibility to choose applications. OpenDoc will allow users to seamlessly integrate text, graphics, tables, multimedia, scripts and other forms of content into a single working document. Instead of having to maneuver among applications, users will easily access any tool or editor to embed different types of content into a compound document. This means that the user will focus more naturally on the task at hand. OpenDoc will ease the computing experience, while ensuring a greater level of customizability and flexibility.

Benefiting Business

Information Systems (IS) management wants to use computers in more strategic ways: re-engineering business processes, mining their companies' information assets, managing work-flow and helping teams be more productive. With the wide and often complex range of platforms and applications, IS managers need to simplify operations. At the same time, they want to protect and leverage existing investments in training, equipment and software. OpenDoc's component software architecture will enable development of custom applications, interoperability on multiple platforms and access to applications, information and services distributed on heterogeneous networks.

Benefiting the Industry

The software industry must face up to and solve the business dilemmas created by competitive pressures, stalled innovation and the growth of mega-applications. Component software provides solutions to these logjams by separating applications into independent and reusable modules of code called components. OpenDoc's component software architecture will enable software developers to focus on the areas where they can add value, because they will no longer have to recreate all the features of an application themselves. With OpenDoc, vendors will have new marketing options, shorter development cycles and quicker time to market.

Making Software Work Together

OpenDoc is the vendor-neutral industry standard for component software interoperability. It will enable the construction of compound collaborative documents and custom solutions. OpenDoc will span all popular desktop and server platforms and will integrate individual desktops with enterprise information systems. OpenDoc will be the easiest way to implement Microsoft OLE 2.0.

OpenDoc is comprised of selected technologies developed by the sponsor members in their respective domains of technical expertise: OpenDoc Component Level Services, OpenDoc Document Level Services, Open Scripting Architecture (OSA), System Object Model (SOM), and Open Linking and Embedding of Objects (OLEO).

OpenDoc is modular. Developers can replace most of the supporting technologies with an API-compliant alternative technology.

- *OpenDoc Component Level Services:* a set of libraries designed to support the integration of multiple software component parts into seamless documents and custom applications. These libraries provide the user with methods for negotiating resources, such as data exchange, persistent storage, object messaging and object linking. Technical features of OpenDoc's Component Level Services-- replaceability, scriptability and overall extensibility-- allow developers to provide additional functionality and create new methods for component interaction.

  Because Component Level Services is based on the object management of SOM (see below), it provides a more complete environment in which multiple components can interact with each other and operate independently in a single document.

  OpenDoc Component Level Services includes Bento, a portable persistent object storage mechanism. Bento allows OpenDoc to store and exchange compound documents and multimedia, currently used in products on UNIX, Windows and Macintosh platforms.

- *OpenDoc Document Level Services:* a set of libraries that handles the human interface and display aspects of creating compound documents and provides basic content editors. These libraries allow users to edit "in place" different kinds of content in multiple formats within compound documents. Technical features of OpenDoc Document Level Services include negotiations for displaying overlapping objects and irregular shapes. Also included is a set of interoperability protocols that enables independent software vendors to design components that can be displayed within one single document.

- *Open Scripting Architecture (OSA):* an automation and scripting API that supports application-independent scripting, distributed automation and work flow applications. OSA is not a scripting language--OSA is a standard for the coexistence of multiple scripting systems. OSA means that "off the shelf" components from any OpenDoc vendor can be scripted together to make powerful custom applications using a wide range of languages. OSA is currently supported by AppleScript from Apple, Frontier from Userland Software Inc. and QuicKeys from CE Software.

- *System Object Model (SOM):* a highly efficient dynamic linking mechanism for objects, which supports multiple languages and provides a gateway to distributed object services. SOM provides OpenDoc's high level of interoperability among components. SOM, developed by IBM, complies with the Object Management Group's (OMG) Common Object Request Broker Architecture (CORBA) specification that makes objects work across platforms. SOM lets users "drag-and-drop" objects, by managing all interactions among the components. IBM originally introduced SOM as part of the OS/2 operating system. It is now available in the SOMobjects Developers Tool Kit for OS/2, AIX and Windows platforms. IBM has widely licensed its SOM-compatible DSOM™ distributed object request broker. DSOM will be available soon on all current OpenDoc platforms, extending OpenDoc component brokering to heterogeneous networks.

- *Open Linking and Embedding of Objects (OLEO):* a set of libraries that enables seamless interoperability with Microsoft Corporation's proprietary Object Linking and Embedding technology for desktop interapplication communication. Through Open Linking and Embedding of Objects, OpenDoc's significantly simpler API allows developers to program to Microsoft OLE much more easily. Objects developed today for OLE 2.0 will run in the OpenDoc world, and OpenDoc components will embed in OLE applications. Open Linking and Embedding of Objects enables bi-directional interoperability between OpenDoc and Microsoft OLE 2.0 for users and developers alike.

CI Labs will support these technologies on Microsoft Windows, Macintosh, OS/2 and UNIX systems. Final SDKs of OpenDoc for Macintosh from Apple Computer, Inc. are scheduled for final release in 1st Quarter '95; OpenDoc for OS/2 from IBM Corporation in 1st Quarter '95; and OpenDoc for Windows from WordPerfect Corporation in 1st Quarter '95.

Supporting Technology Development

CI Labs licenses and promotes the technologies contributed by the sponsor companies, and distributes them as reference source code. Members will continue to compete on other technologies that differentiate their business solutions, as they contribute to CI Labs their "non-differentiating" infrastructure technologies. CI Labs manages the specifications for the technologies under its control, and performs the following functions:

- Adopt and promote the key technologies essential for software components to integrate information and media from different applications within a networked environment and on multiple platforms.
- License reference source code to developers and system vendors.
- Provide open access to decision making and priority assessment in a vendor-neutral forum for system manufacturers, software vendors, organizations with in-house developers, and purchasers of systems and application software.
- Manage and facilitate software contributions, design discussions, technology definition and evolution.
- Support developers in adopting these new technologies by providing test suites, documentation and training.
- Validate interoperability of components and platforms through a comprehensive testing program.
- Assist in marketing efforts.
- Collaborate with standards organizations (such as the OMG) on relevant issues.

Shaping the Future

CI Labs and its members are committed to providing solutions to meet today's complex and evolving computing needs. OpenDoc is not technology for the sake of technology--it will empower people and organizations with new capabilities that are both powerful and easy to use. The benefits of widespread adoption of OpenDoc will be revolutionary for users and developers alike.

Apple, the Apple logo, and Macintosh are registered trademerks of Apple Computer, Inc. OpenDoc is a trademark of Apple Computer, Inc. OS/2 is a registered trademark of International Business Machines Corporation. UNIX is a registered trademark of UNIX System Laboratories, Inc.

CI Labs Internet Lists

CI Labs provides on the Internet, technical and non-technical informationof OpenDoc, related services and forums regarding CI Labs, and component software in general. To request information, address an email message to:

MAJORDOMO@CIL.ORG
(via AppleLink the address is MAJORDOMO@CIL.ORG@INTERNET#).

In the FIRST line of the body (NOT in the SUBJECT line!) put one of the following requests (without the quotes):

"help *your e-mail address*" --this will send you email describing majordomo
"lists *your email address*" --this will send you a list of CI Labs mailing lists

If you have a signature automatically appended to your email, you should put the command "end" at the end of your email to majordomo, or else it will try to interpret your signature as a command -- this probably won't do any damage, but majordomo's complaints may be annoying.

Once you know the lists you are interested in, you can subscribe,unsubscribe, get related files, etc. all by email. The help document from majordomo explains how to do all these things.

CI Labs Files

CI Labs also maintains a number of files on CIL.ORG. These files are available via:

Mosaic or World-Wide-Web at URL="ftp://cil.org/pub/";

anonymous FTP at CIL.ORG;

or FTPMail. To get information on FTPMail, send a message to FTPMAIL@CIL.ORG with the single word "HELP" (without the quotes) in the body of the message (again, commands in the "Subject:" line are NOT processed).

CI Labs Contact List

For More Information Regarding CI Labs:

Ed Niehaus
Niehaus Ryan Haller Public Relations, Inc.
Phone: 415.615.7908
Fax: 415.615.7901
ed@nrh.com

Tamara Ireland
Niehaus Ryan Haller Public Relations, Inc.
Phone: 415.615.7892
Fax: 415.615.7901
tamara@nrh.com

For More Information Regarding CI Labs' Sponsors:

Nancy Morrison
Apple Computer, Inc., Public Relations
Phone: 408.862.6200
Fax: 408.974.6412
n.morrison@applelink.apple.com

Nancy Raff
IBM Corporation, Public Relations
Phone: 415.776.1547
Fax: 415.776.3657
raff.n@applelink.apple.com

Bill Kesselring
WordPerfect, The Novell Applications Group
Phone: 801.228.7015
Fax: 801.228.4977
billk@wordperfect.com

For more information, send email to CILABS@CIL.ORG.