**Synex ViewPort™** is a cross-platform SGML/HiTime browser engine for adding SGML support to any application. A Synex ViewPort™-based application can process and display SGML data from any source, even in a single document: some parts may be retrieved from databases, others from files, through networks, or even created on demand, when needed. The engine accepts both SGML and an efficient preprocessed binary format designed for CD-ROM or network delivery.

Synex ViewPort™ is designed to meet the complex requirements of CBT (Computer Based Training) and IETM (Interactive Electronic Technical Manual) applications. The API offers roughly 300 functions for advanced rendering, navigation, and content retrieval, and about 50 callbacks to tailor the application behavior. Yet a fully functional SGML browser application can be made using a mere handful of API calls.

The **Hypermedia and Graphics support** of Synex ViewPort™ acts directly on links defined by the document markup, including linking into and out-of hot spots in graphics. The built-in HiTime support allows cross-document links to any element or textual span, complemented by TEI extended pointers which provide a compact and efficient notation for link specification. References to graphics are resolved automatically, with images displayed inline or in zoomable windows.

Synex ViewPort™ supports a wide variety of graphics formats and additional formats can easily be added using an open interface.

**Style sheets** describe rendering of SGML data for complex formatted presentation using property inheritance, contextual criteria, and tests for attributes and attribute values. Any element can be hidden behind an icon for display in a separate pop-up window, and any style sheet can be used for printing. The API supports run-time changes of style settings.

---

**Full Extensibility**

The Synex ViewPort™ Widget Interface allows developers to integrate any rectangular objects into the browser. This way, applications can support non-SGML data such as inline QuickTime video, rmg, forms, or Java applets in Synex ViewPort™-based applications—even though Synex ViewPort™ itself knows nothing about these media types.

**Key Concepts**

- **Easy Installation:** Synex ViewPort™ can support any SGML application. You can quickly install Synex ViewPort™ and begin processing applications within minutes. There is no complex programming involved.
- **Multiplatform Support:** Synex ViewPort™ supports multiple platforms, including Microsoft Windows, Macintosh, and Unix. It is a cross-platform solution.
- **Interactive Rendering:** Synex ViewPort™ provides interactive rendering of SGML documents. Users can interact with the content, making decisions, and engaging with the material in real-time.
- **User Customization:** Users can customize the look and feel of the application by setting preferences and storing them for later use. The interface is highly customizable to meet the needs of different users.
- **Data Linking:** Synex ViewPort™ supports linking to other documents, images, and resources. Users can jump between different parts of the document, external links, or related resources.
- **Security Features:** The application includes security features to protect data and ensure confidentiality. It supports robust encryption schemes to protect sensitive information.

---

**Total Control**

The Synex ViewPort™ Entity Manager is easily customized to fit any requirement. The document contents can be read from an SGML database, retrieved over the internet, or even generated on-the-fly your application is in control. Documents can be delivered on CD-ROM, with updates seamlessly downloaded over networks as Synex ViewPort™ can retrieve its input from wherever it resides, whenever needed. The customizable entity manager also allows sophisticated encryption schemes to be added between Synex ViewPort™ and the data, where information is decrypted only when displayed on-screen. The same mechanism can be applied to selective display of document contents—the first chapter of a book can be given away freely while the remainder is displayed after obtaining a software key.

---

**Any GUI**

Since Synex ViewPort™ does not have an Interface of its own, the look-and-feel of the application is up to the developer. Synex ViewPort™ can even be used in applications without any user interface at all, parsing and processing SGML files in batch. Making SGML plug-ins for Netscape Navigator or Microsoft Internet Explorer is a simple exercise, and no matter what programming tools, toolkits, or application frameworks you use, Synex ViewPort™ will cooperate.
Setting the standard in SGML browsing

When we ask our customers what Synex ViewPort™ feature they value most, two answers stand out: the ease with which Synex ViewPort™ can be integrated with any application, and its customizability—the ability to adapt to any needs, using any development environment. Even though the two might seem contradictory, they are actually consequences of the Synex ViewPort™ architecture.
Some Customer Applications

1. **Scania Multi** is an interactive, ca-data-based product information system. Developed by [Enne Data AB](#) for Scania AB, Multi is currently in use in 30 countries worldwide. This support and maintenance system adapts the documentation and parts catalogue dynamically to a precise, individual vehicle using the chassis number as key. The flexible design simplifies the repair procedure and cuts down the time required for maintenance.

2. **Sogtec industries SA** specializes in SQL, document management systems supporting the entire life cycle from creation to publication. **ViewTec** is a set of tools designed for building and viewing electronic publications. The ViewTec Builder constructs electronic publications from SQL/ HyTime databases, and the ViewTec Viewer enables you to browse and search the electronic publications created with ViewTec Builder.

3. **SilverPlatter information** publishes over 200 bibliographic and full text databases of reference information, used at more than 20,000 institutions worldwide.

   The SilverPlatter client-server retrieval technology (SLR) allows users to access these databases on CD-ROM, LAN, WANS, or across the Internet. SilverPlatter's latest version of their search-and-retrieval software (WinPLS/P) for Microsoft Windows, supports the display of SQL, documents contained in ERL-compatible databases, and includes the ability to limit searches to a particular source element.

4. **Sigmalink** is a document management and retrieval system with full SQL and XML support, developed by STEP-Stilt Electronic Publishing for publishing houses who publish on multiple media, and for different purposes. All document management, editorial, and workflow components, can be used with data of arbitrary format. The system can be configured for any SQL editor.

   Sigmalink integrates tools like Word, full-text retrieval, an SQL transformation and communication engine, workflow, WXS servers, and an SQL browser developed using Synex ViewPort™. For SQL data, Sigmalink provides a wide variety of HyTime-based linking methods, controlled through the database, and split-and-join mechanisms to define information items according to specific needs.

5. The **SplitVision™ Lite Builder** from Silverman Information is an easy-to-use tool for etm (Interactive Technical Manual) authors, which features drag-and-drop support of both scan, and graphics, editors for navigation, style sheets, and web. It is also straightforward to learn external applications from the Builder, making it an ideal complement to an SQL authoring environment.

6. **Multiloc Pro** from Clicc Information Technology is used for publishing and browsing multiple SQL databases, which can be located on the Internet, Internet, LAN, WANS, or on CD-ROM. Multiloc Pro lets you search and navigate through these document sets, with support for markup-based queries using an intuitive interface. The browser supports a wide variety of media including inline video and an easy-to-use style sheet editor with WYSIWYG preview.

7. **Enatrix Information Management** has developed **InfaView™** for simplicity and flexibility in supporting standards such as SQL and HyTime. Navigation in Interactive Electronic Technical Manuals (etm) based on InfaView™ can be done using hot spots in graphics or one or more material structures presented as expandable trees. This methodology is particularly useful for modular information storage and management of SQL documents can be done in SQL, or on relational databases. Between data storage and viewing, SQL is an ideal complement to an SQL authoring environment.

   The InfaView™ application is built using an in-house component-oriented toolkit written in C++, based on the Microsoft Foundation Classes and Synex ViewPort™. Custom-made etms can be created quickly and configured for a variety of user requirements.

8. **Kluwer Legal Publishers** (Kluwer Rechtswetenschappen Belgie, a division of Wolters Kluwer) publishes legal information for professional legal customers. This application, currently in development, is an integration of Datanerd's Co-Author retrieval software and Synex ViewPort™ — the program is developed using Borland Delphi. The image shows a customized navigator containing the structure of a law, and a browser window, displaying one particular article of the law.

   Synex ViewPort™ is used both for the data preparation, to convert SQL input files to a record-based file for Dataware co-author, and for the on-line display of each referenced record.

9. **PROSIS** is a Product Support Information System made by Enne Data AB for Volvo Construction Equipment AB. The quarterly published CD-ROMs are distributed worldwide. It features sophisticated hypermedia capabilities for moving between parts catalogues and corresponding maintenance manual sections.

10. **Nereus™** from Vicom Multimedia is a collaborative authoring system designed for rapid creation and revision of media-rich works and customized specifications, with no programming. The Nereus™ Media Asset Manager is a comprehensive, centralized management system for classifying and managing media assets such as audio, video, images, and text—including SQL, its authoring support features include scheduling, production monitoring, and activity-based job costing.

    Nereus™ provides a high-speed solution for the development, delivery, and management of large-volume, complex multimedia projects. The fully integrated tool set includes a simple-to-use user interface, reusable templates, and full drag-and-drop capabilities.

11. As SQL is a CSE requirement, a fair number of Synex ViewPort™ applications are in **Government and Defense**. Unfortunately, these are often not public. Among their reasons for using Synex ViewPort™ is its customizable Entity Manager that lets you add any category of any strength — as part of the document processing; it is also straightforward to integrate with database and workflow systems.
Technical Description

Hyperlinking
- Built-in support for:
  - event-driven linking and addressing
  - comprehensive syntax for extended pointer syntax
- Customizable hyperlinking, turning any element into an arbitrary processed link
- Extensible sawa-based hot spots in graphics, including support for:
  - magnification
  - colored hot spots
  - animated boundary
  - rectangle, ellipse, or polygon-shaped hot spots

Navigators
- Generalized table of contents extract any element for navigation
- Platform-independent
- Coupled to onto or specific document instance
- Automatic encapsulation reflecting the document structure
- Any sawa document can be displayed as a navigator

Webs
- Containers for user/publisher annotations, bookmarks, and hyperlinks
- Platform-independent
- Apply ISO standard HyTime for portable addressing persistent across document revisions
- Excellent tool for electronic review
  - Attach data to documents on non-writeable media
  - Separation of user/publisher-added data from document contents
  - Multiple webs can be active simultaneously

Style Sheets
- Platform-independent
- Coupled to onto or specific document instance
- Conditional formatting based on kindship, attributes, and occurrence
- Inheritance for default appearance
- Font family, size, slant, weight, color, and baseline offset
- Left, center, and right justification
- Leading and horizontal/vertical spacing
- Page background color or image
- Underlining, overlining, and strike-through
- Hide any element behind a configurable span and reveal it on user click
- Element pre- and post-insertion of text, icons, and attribute values
- Horizontal rules and vertical change bars
- Engineering math (such as fractions, radicals, and indices)
- Content hiding
- Comprehensive table support
  - Support for SoftQuad table cells
  - Any behavior markup can be displayed as a table
  - Run-time query callbacks

Printing and Copying
- Print document or document portion using any style sheet
- Supports copying of user selection as ASCII or as sawa.
- Supports end-user annotations in hard copy output
- Supports customizable headers and footers
- Print preview
- Pre- and post-processing of hard-copy pages (to add arbitrary text and/or graphics such as logo/phot)
- Page count and numbering specifications
- Multi-page data tables with repeated table headers and footers
- Extraction of any element to headers/footers
- Optional printing of navigator(s) with resolved page references
- Optional page numbering and date insertion

Customization and Extensibility
- Over 300 add-on functions and 50 callbacks
- Widget feature for insertion of any rectangular object into browser contents
  (e.g., Java applets, multimedia, or inline video clips)
- Open interface for integrating third-party graphics libraries
- Capable of launching any external viewer

Entity Manager
- Customizable to retrieve entities at run-time:
  - from a file
  - from a new memory buffer
- Piece-by-piece through a generating procedure
- Dynamic document assembly from multiple input sources
- Supports the SGML Open catalog format
- Can easily be configured for any type of encryption scheme

SGML Parser
- Supports any SGML and an extended core syntax
- Very fast, designed to read sawa files for immediate on-line presentation
- Supports all entity types except subst
- Full short-cutting and limited charting support
- Supports &lt;\circ\text*, attributes \& \text* and \text* entities
- Can pre- and re-use data and document instances for efficient processing
- Supports nested marked sections (\text*, INCLUDE, \text*, XML, XML,
  \text*, and \text*)
- Supports parsing of the document type declaration subset

Information Retrieval
- Textual content, markup, declared entities, and processing instructions
- Element by generic identifier, its \text* points, and textual content
- Element parent, children, siblings, and attributes
- Attribute types, default value, and actual value
- Web annotations, bookmarks, and links
- Style sheet and navigator configuration

Document Searching
- Full text string searching (case-sensitive or exact)
- Markup-based searching
- Regular expressions (in both search modes)
- Using to extended pointers
- Combinations of the above
- Search hits indicated using graphical occurrence density display and/or hit count in navigator at corresponding entry

Graphics Support
- Raster and vector graphics
- Extensible open interface
- Supports graphics tear-off/zoom/pan/zoom
- Optional autozooming of graphics
- Zoom overview

Miscellaneous
- Built-in history list maintains backward and forward user movements
- Graphical view of document instance as an sawa tree
- Show Tags option to display markup
- Support for Japanese Shift-JIS encoding
- Unicode support (during 1997)

Available Platforms
- Microsoft Windows NT/95/3.1X
- Unix/Mc68
- Macintosh 68K/m68k

SGML Browser Application

<table>
<thead>
<tr>
<th>Synex ViewPort™ API</th>
<th>Win</th>
<th>Mac</th>
<th>Unix</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Programming language of your choice

Internally, Synex ViewPort™ is divided into three separate layers—the kernel, the platform-dependent layer and the Synex ViewPort™ API itself. The kernel is the largest part, the heart of Synex ViewPort™. All platform-specific dependencies are kept in the platform-specific layer, whereas the Synex ViewPort™ API is identical across all supported platforms.
Synex Information AB is a high-tech development company specializing in SGML browsing technology. The company was founded in 1993, as a result of years of research and development at the Royal Institute of Technology in Stockholm, Sweden. Synex Information has its offices in a 17th century building in the scenic Old Town of Stockholm.

Synex Information is a sponsor member of SGML Open. The company has been profitable every year of operation, is privately held, and financially independent.

The company flagship Synex ViewPort™ has set the standard for SGML browsing. It is represented by resellers throughout Europe, North-America, and Asia.

Synex Information is at the leading edge of SGML browsing technology, and committed to stay there.
A Seybold Reprint

This material appeared in The Seybold Report on Publishing Systems (ISSN 0736-7260), Volume 25, Number 19. It is reproduced here exactly as originally published. It has not been abridged, revised, or updated since its first publication on June 30, 1996. Seybold Publications reserves the right to alter formatting as space requirements dictate, but no changes can be made in the textual material to be reprinted. Seybold Publications has prepared this reprint at the request of Synex.

Synex ViewPort covers the floor

Synex Information AB, makers of the ViewPort SGML-HyTime browser engine best known as the basis for SofiQuad’s Panorama, announced upgrades supporting multibyte Japanese and new graphics formats including CGM. Even more impressive than these announcements was the news that of the approximately 32 other vendors exhibiting at SGML Europe ’96, seven were showing or developing browser applications based on ViewPort. These seven, which amounted to almost one out of four exhibitors, were Open Text, Sorman, Information Dimensions, Enator Information Management (which is the representative of Grit), STEP, OCLC and, of course, SofiQuad.

Synex, based in Stockholm, is a small, privately held company founded in 1993 to develop technology based on years of research and development performed at the Swedish Royal Institute of Technology. ViewPort itself is a browser engine with extensive support for customization. It is actually a C API to a C++ kernel. As such, it is available from all current languages and programming tools. More than 250 API functions and 50 callbacks give developers ample hooks and platforms to create a broad range of user-interface options and user functionality. (Callbacks are integrator-supplied functions that ViewPort can call during processing.) The API is portable across platforms so developers can design applications using the GUI tool with which they are most comfortable.

Commercial products built around ViewPort can take advantage of its availability on multiple platforms to suit a wide-ranging audience. Those integrating custom systems can optimize it for a known environment.

Integrated systems. Synex demonstrated integration relying on simplified graphic interfaces and others using complex, text-based interfaces. A system built by ENEA Data AB for Volvo Construction Equipment uses large, graphic icons representing different types of heavy equipment. This application uses little text and few on-screen choices. You pick your truck and either a parts catalog or a service bulletin.

Custom applications built by Information Dimensions Scandinavia AB and Sorman Information AB rely more heavily on text and structure. These applications give the user access to detailed, multilevel tables of contents as well as graphics and

Reproduction in whole or in part without written permission is prohibited.
views into the underlying SGML database. The ability to import any valid SGML document, declaration and document type, and its support for HyTime linking, set the ViewPort engine apart from other current SGML browsing software. (The next release of DynaText from EBT will also support import of any valid SGML, without precompilation.)

**General features.** ViewPort supports SGML processing and viewing, access and retrieval. The engine takes included fragments, whether off of a network or a CD-ROM, and dynamically assembles them as if the user were viewing one document. ViewPort supports search and navigation based on structural context and attribute values, or a combination of these. The occurrence density display, table of contents navigator and custom navigators, multiple style sheets, and linked annotations used in Panorama are all features of the basic ViewPort engine. It can launch external applications and support printing by any attached style sheet.

**Linking.** ViewPort uses a HyTime subset for linking, but it doesn’t stop there. It supports the basic ID/IDREF mechanism of SGML and the TEI (Text Encoding Initiative) extended pointers. What this means for application and document designers is that once the HyTime entity catalog has been established, any element can be a link anchor or endpoint by virtue of its generic identifier (tag). The endpoint for the link can be resolved on the fly or can be hard coded and links can be bi-directional and one-to-many. This contrasts sharply with Web linking mechanisms that require hard coding of all endpoints on a one-to-one basis.

**Entity management.** ViewPort provides dynamic SGML entity resolution. This means that a browsed document can consist of multiple files and pieces of files residing on diverse media but linked through SGML entity management. For the user, the document appears as one seamless unit, but in practice, graphics, character sets and whole chunks of text may originate in multiple locations, local and remote, as long as the location is properly identified and is accessible. ViewPort uses the SGML Open Public Reference Catalog and its own internal entity manager to resolve and retrieve entities. The location of an entity is determined using SGML’s public and system identifiers, which permit on-the-fly modification based on information supplied during use.

**Graphics and “widget” support.** New graphics formats supported include CGM (computer graphics metafile, an ISO standard vector format), and raster formats such as TIFF, CCITT Group 3/4, JPEG, BMP and EPS preview. Synex claims it has the best CGM support in an SGML browser, including all three types of CGM encoding. It licenses the CGM technology from Henderson Software, Inc., which has NIST certification for compliance. (We would note that EBT also has CGM support in DynaText, and also developed a CGM viewer for Netscape.) All graphics support hot spots and are viewable inline or in sizable popup windows that support zooming and panning across objects.

Synex “widgets” are part of a plug-in architecture that supports presentation of any rectangular object. The new ViewPort will be able to insert any widget inline, including video, forms and dialogs.

**Availability.** The new features will be available in ViewPort 1.3, which is expected to be available for all Windows, Macintosh 68K, Power Mac and Unix Motif platforms at the end of June.

**Open Text using it, too.** In a separate development, Open Text, which for a long time had its own SGML viewer for its text-retrieval software, is developing a more robust SGML viewer for the U.S. Government Printing Office. It is based on the Synex ViewPort.