

Architecture Overview

Interwoven's Scrittura Software Platform

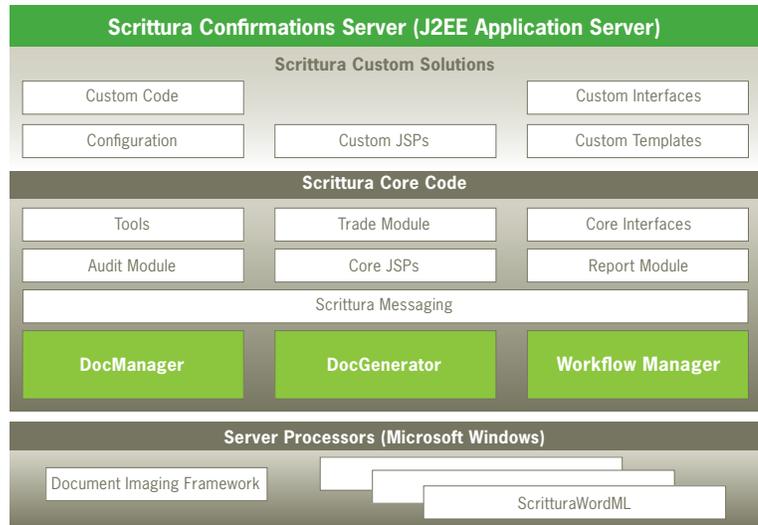
Powerful technology for capital markets operations

Interwoven's Scrittura is recognized as the market leader in enabling automation of documentation and operations in the middle- and back-office in the financial securities and capital markets. Scrittura's innovative solutions are based on the Scrittura software platform, which enables capital markets operations to automate and manage the full lifecycle of trade documentation by utilizing Scrittura's robust, scalable, extensible, and cost-effective technology.

Scrittura software platform: state-of-the-art technology for financial services

The explosive growth of the volume of OTC derivatives trading, the increasing complexity of these instruments, and an expanding regulatory spotlight are creating a new set of IT requirements for OTC trade processing in the back-office:

- Scalability and capacity to address ever increasing volumes of trades.
- Flexibility and extensibility to rapidly adapt to the continuous innovation of increasingly complex structured financial products to meet client demand.
- Openness and standards compliance to easily interoperate with complex systems covering different parts of the trade lifecycle.
- Automated integration of processes and data to streamline workflows, reduce manual practices, minimize errors, and manage operational risks.



The Scrittura software platform architecture delivers the benefits of modular design.

- Sophisticated audit, version control, and reporting functionality designed into the system to meet regulatory requirements.

Scrittura delivers a state-of-the-art software platform, built from the ground up to address these back-office requirements and to provide a unique technological advantage to financial firms for the most efficient capital markets operations.

Platform architecture

Scrittura's Web-enabled software is built on the J2EE platform and uses EJB, JSP, Servlets, JMS, and JDBC. The Scrittura software platform complies with the latest draft version of J2EE 1.3 specification, including EJB 2.0 and JSP 1.2. Where possible, Scrittura also makes

use of industry-standard specifications for application components and data interchange.

One of the benefits of the J2EE infrastructure is its support for component-based system construction. Interwoven leveraged this component architecture in its development of Scrittura, so that each of the principal components of the Scrittura platform is in fact a modular, reusable software component. A key attribute of the Scrittura design is that each component is not only a critical part of the Scrittura software platform, but also provides value as a stand-alone off-the-shelf component. These components can be reused in the Scrittura customers' own applications.

“There are many potential economies to be maximized in the derivatives documentation process. Scrittura fits in with our bank-wide strategy to increase efficiency by leveraging modern intranet technologies.”

—Luzia Nicosia, Commerzbank’s VP of Interest Derivatives Operations

Platform components

At the core of the Scrittura software platform are the following three powerful engines that can be installed independently, or operate seamlessly together:

DocGenerator

Scrittura’s DocGenerator is the component engine that creates trade-related documents. Through dynamic templates, data feeds can be taken from external sources, enhanced and modified by a controlled group of users, and transformed into a final document.

DocGenerator merges a name-value-pair file, FpML file or XML file with a template (HTML, XSLT, JSP or WordML) to produce a generated document (HTML, WordML, Postscript or PDF). DocGenerator’s engine can be extended with custom classes and tags to enhance the document generation.

DocManager

Scrittura’s DocManager provides an open repository for all trade-related document types. A Web-based front-end is available for use as a standalone client, as well as a comprehensive API for integration and a WebDAV interface. DocManager is built on EJB 2.0, JSP, and Servlets.

DocManager supports version control, check-in, check-out, a loose or strict hierarchical structure, full-text search, extensible field types, automated and Web-based indexing, and Web-based viewing of documents. All relevant document types are supported by the system, including DOC, XLS, TIFF, PDF, HTML, and XML. Viewing documents requires only the appropriate plug-in to the browser. Furthermore, DocManager supports a variety of integration methods, including API-based, control file-based, and XML-based

integration. Also, the MVC framework front-end and the JSP front-end permit easy customization by the end-users.

Workflow Manager

Scrittura’s Workflow Manager enables back-office personnel to customize and automate the entire workflow process, for complete lifecycle management of trade documentation. The workflow engine is designed around the Workflow Management Consortium (WfMC) specifications. It is an XPDL- (WfMC XML Process Definition Language)compliant engine, designed using EJB 2.0 and JMS. The Workflow engine includes a graphical XPDL generation tool, built using Microsoft Visio as the visual and design tool.

The Workflow Manager is designed for maximum reusability and scalability to enable easy customization of the Scrittura system and its components to meet customers’ exact needs. The Workflow Manager supports conditional routing, splits, joins, and sub-workflows and includes three separate methods for application integration (two automated application steps within the workflow definition, and automated queue-based activities).

In addition, the Scrittura software platform offers the following major components to extend its core functionality, enhance usability, and respond to industry-specific requirements:

Audit & Reporting Framework

The Audit & Reporting Framework provides out-of-the box and customizable reports to meet operational and regulatory needs. It allows granular control of user-definable events and supports a simple EJB 2.0 API. Reporting can be accomplished through the API or by performing queries directly against the data store, using standard

reporting tools, such as Crystal Reports. Also, the Scrittura software platform includes a third-party Web-based reporting tool called Style Reports, and support for JasperReport.

Document Imaging Framework

The Document Imaging Framework provides support for scanning, fax-in, barcode recognition and generation, OCR, and image processing. This framework can be used alone or integrated with the DocManager and Workflow Manager engines to provide a sophisticated rule-based document imaging system. For instance, by using bar-code and OCR technology to process inbound documents, the document imaging system can support automated routing of inbound documents and matching with appropriate trades. The workflow engine can then notify appropriate users that the trade needs action and move the appropriate documents through correct processing and generation queues and tasks.

Scrittura WordML®

Scrittura WordML is a powerful addition to DocGenerator that allows users to maintain templates and generated documents in Microsoft Word. It requires Microsoft Word on Microsoft Windows to convert WordML documents to PDF and to compare WordML documents. The WordML application can run on a remote computer connected to the main Scrittura software platform server (it is even possible to set up an array of WordML applications on remote computers to handle large volumes of data).

Scrittura Messaging

Scrittura Messaging comprises the messaging infrastructure of the Scrittura software platform. Based on JMS, it generates FpML and other XML-based message types for use with central trading and matching services such as DTCC, EDX,

According to Tower Group, the practice of financial firms to invest in a core platform and universal functionality across all derivative products speeds up the development process and enables firms to create new products more easily and quickly than they could by pulling all the pieces together each time a new product needs to be constructed.

and SWIFT, enabling STP of OTC derivatives trading.

Scrittura Matcher

Scrittura Matcher is a comprehensive matching engine that can be used on a bilateral or hosted basis for diverse matching of OTC messages.

Platform requirements

Scrittura hardware requirements

Scrittura runs on any x86, x86-64, and SPARC processor servers supported by BEA WebLogic 8.1.

Scrittura software requirements

Scrittura runs on SUN Solaris, SUSE Linux, and Microsoft Windows NT/2000/2003 operating systems.

Scrittura currently supports BEA's Weblogic application server version 8.1 and is scheduled to support version 9.1 with the Scrittura 4.1.19 release. Support for IBM WebSphere application servers is planned with the Scrittura 4.2 release.

Oracle 8/9/10, Sybase 12.5, and SQL Server 2000/2005 are the supported relational databases.

Users access the Scrittura software platform through Microsoft Internet Explorer or Netscape Navigator or Firefox Web browsers. WordML template editing requires Microsoft Word (as part of Microsoft Office 2003).

Specific requirements:

- To perform OCR, the Document Imaging Framework usually requires third-party libraries available only on Microsoft Windows and therefore has to run on a Microsoft Windows server.
- HTML-to-PDF conversion is done using `htmldoc`, available on a wide range of

platforms including all the supported Scrittura platforms.

- PDF rendering can optionally be done using ghostscript, an open-source PS/PDF rendering tool available on almost every platform including all the supported Scrittura platforms.

Platform interoperability

The Scrittura software platform interfaces with many popular systems for:

- Order management
- Portfolio management
- Risk
- Credit
- Accounting
- Fax server
- E-mail
- LDAP/SSO
- Document storage & retrieval

Scrittura's technological advantage & key business benefits

The Scrittura software platform enables financial firms to manage all trade-related documentation together in a single system. The system supports generated confirmations, responses and signed confirmations, email correspondence, internal electronic documentation, paper correspondence, and related legal documentation. With Scrittura, users can conduct searches across this full body of documentation using trade parameters, document details, and full-text searching. Furthermore, users are able to share this information and collaborate using a single secure Web-based interface.

The Scrittura software platform offers a powerful and cost-effective technology

base for back-office processing of OTC derivatives, enabling financial firms to:

- handle growing volumes of trades involving increasingly complex products
- improve time-to-market for new trading products
- enhance efficiency and improve productivity in the back-office
- mitigate operational, credit, and legal risks

Today, Scrittura is the trusted choice of more than 30 of the world's largest dealers and investment managers who rely on Scrittura's solutions on the Scrittura software platform to transact billions of dollars in derivatives every day.

Interwoven is a global leader in content management solutions

Interwoven's software and services enable organizations to effectively leverage content to drive business growth by improving the customer experience, increasing collaboration, and streamlining business processes in dynamic environments.

Our unique approach combines user-friendly simplicity with robust IT performance and scalability to unlock the value of content.

Today, nearly 3,800 enterprise and professional services organizations worldwide have chosen Interwoven, including: adidas, Airbus, Avaya, Cisco, DLA Piper, the Federal Reserve Bank, FedEx, HSBC, LexisNexis, Microsoft, Samsung, Shell, Samsonite, White & Case, and Yamaha. Over 18,000 developers and over 300 partners enrich and extend Interwoven's offerings. To learn more about Interwoven, please visit www.interwoven.com.

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