White Paper

W.A.R.N. Continuity

Instant Connectivity to Multiple Systems

W.A.R.N. Continuity links to virtually every electronic system, sensor and database found in the supply chain or within the Extended Port model. W.A.R.N. Continuity takes intelligent, conditional and coordinated actions on all information data sources and systems. By clicking on visual wizards with Instaknow Designer or point and click / drop down boxes with W.A.R.N. Continuity accelerators, a business analyst can define custom business rules that can read and update data, make real time decisions and take actions across a wide variety of systems. They include reading and writing data and taking actions on XML/SOAP web servers, HTML web sites, Legacy systems (mainframe/AS400/SNA), ODBC databases (Oracle, Sybase, SQL Server, DB2, Adabas, Informix etc.), Lotus Notes applications, ERP systems (SAP, PeopleSoft etc.), X12 EDIs, GUIs of client-server applications, Applets, custom APIs of third party systems, files, spreadsheets, PDF files, Visio diagrams, MS Project plans, message queues, images (using OCR), faxes, Sensing Instruments, e-mails and voice mails. The output result from this custom application processing can be fed immediately to other systems or presented on browsers, PDA's and other hand-held devices, e-mails, beepers, faxes, and voice-mail. Applications can also be instructed to seek and wait for human intervention/response when required. All interactions with these systems (including web based HTML and XML systems) is defined and executed via visual wizards without needing programming in a conventional programming language. Typically no change is needed to the existing application being accessed.

"Configured" Visual Wizard Interfaces

The Instaknow Designer development environment, which is fundamental to W.A.R.N. Continuity offers a full feature IDE (Interactive Design Environment) with smart visual wizards to allow users to quickly convert ANY business intent into Business Process automation instructions. Any business logic, however simple or complex, can be deployed with a few clicks of the mouse. Each wizard accomplishes the work equivalent to thousands of lines of conventional code. The business workflow can be "debugged" by using built-in visual testing facilities similar to those offered by other interactive programming languages like Visual Basic. Like all other features of Instaknow, the testing facility is 100% visual point-and-click. Extensive context specific on-line help is available with each wizard. Visual cut, copy and paste facilities are available to quickly change the business rules when the business reality and requirement changes. No knowledge of a programming language is needed to use the Instaknow-ACE wizards.

Advanced Data Exchanges with other Systems

The Instaknow-ACE includes 100% point-and-click wizards to extract data from difficult sources like PDF files, images (using OCR - Optical Character Recognition), faxes and message queues. Advanced actions include automatically putting transaction specific data in HTML/XML web sites and pressing correct links and buttons. When the web server responds, the data of interest is automatically extracted and is made available to the Instaknow program for further actions as specified by the user-entered custom business rules. If the web page layout changes between the time the web interaction was defined and its execution, Instaknow-ACE wizards automatically

apply pattern-matching algorithms to cross check the validity of the data being extracted. Situations like longer/shorter paragraphs, and more/fewer rows in tables on the web page are automatically handled by the wizards. If the web page changes are so drastic that the business information is no longer present on that web page or if the web address is no longer valid, Instaknow-ACE wizards detect the situation and return appropriate error messages to the business logic so that corrective actions (e.g. going to an alternate web site/server to get the same business information if possible) can be taken as per the business preferences. No coding in a conventional programming language is needed to implement these advanced solutions. The wizards also enable bi-directional Web Service interactions.

Intelligent Automated Web Searches and Document Searches

W.A.R.N. Continuity includes features that perform nested, multi-level, customizable and closed-feedback-loop Web searches to retrieve useful information and integrate it seamlessly with in-house data. In addition, multiple site "super searches" with compound inclusion and exclusion criteria can be launched using W.A.R.N. Continuity as per user specified business rules. Additional capabilities analyze the combined in-house and web based knowledge and automatically takes intelligent actions on multiple in-house systems and systems of external partner organizations using the Web. All of these steps are controlled by the end-user's specified business rules, rather than a programmer's code. It allows trained business users in any industry to create customized Web integration / actions solutions. The search wizards automatically apply user-supplied preferences about inclusion and exclusion criteria, pattern of phrases, distance between phrases, distance of phrases from top of the document, number of occurrence of phrases etc. The searches can also be applied to documents on LAN / WAN file systems to identify documents containing specific information. Once found, the desired sections of the documents can be sent as e-mail attachments, published as HTML or XML and stored in databases.

Multi-language / Multi-currency Translation

W.A.R.N. Continuity has embedded features that allow connectivity with all Web-based HTML/XML/WML data including quick enabling of multilingual/multi-currency capabilities required by today's global enterprises. Foreign language web data can be included in Web searches, local data can be published in a foreign language and currencies can be converted to one another using spot currency rates using built-in features of W.A.R.N. Continuity. Forward currency contract rates can be used if that rate is available on a local system or a Web site.

Unique Advanced Features

Additionally, W.A.R.N. Continuity offers wizards with advanced features that are not found in any other programming language or protocol. Examples are advanced multi-language web searches based on custom dynamic criteria and wizards for ANY source-to-XML transformations. Even faxes can be converted to XML.

Remote User Interaction and Computer-Telephony-Integration

The market research firm, IDC, predicts the number of wireless devices connected to the Net will be three times greater than the number of PC's connected by the end of 2004, resulting in more than 100 million wireless Internet devices. W.A.R.N. Continuity provides built-in features to send customized real time HTML / WML data, SMS messages, faxes and e-mails to hand-held devices like PDAs and paging equipment, based on customized business rules. Advanced CTI (computer telephony integration) features like "Presence Management" (aka "Follow Me") and system initiated multi-party conference and IVR calls can be conditionally invoked from W.A.R.N. Continuity by clicking on pre-built business level user interfaces. Additionally, W.A.R.N. Continuity can automatically start Net Meetings by intelligently locating users across the Internet.

Extended Workflow Automation

W.A.R.N. Continuity employs Process, Resource and Logic Modelers to define combinations of manual and automated workflow segment dependencies of any sophistication to automate and expedite complex workflows in an efficient manner, without program coding. W.A.R.N. Continuity also provides for definition of business rules that decide how a long-running business transaction should flow through the organization's automated and manual decision making over several days.

The workflow definition includes:

- Specification of normal business rules for all events in life-span of the transaction
- Exception handling rules
- Senior-authority overrides to normal rules if and when required, subject to permission check
- Automatic re-tries of automated workflow segments when some required systems are down
- Synchronization of results of parallel decision-making before a dependent workflow is initiated
- Cancellation of partially processed business transactions under appropriate business conditions
- Scheduling of bulk transaction processing
- Automated e-mail, beeper, pager, cell-phone, Instant Message, Net-Meeting alerts to appropriate parties when needed

After W.A.R.N. Continuity business workflow dependency definition is configured and activated; all further transactions are automatically routed from one decision-making segment into another according to the clicked-in business rules (business logic). The workflow segments can be manual across many departments and/or automated across many diverse internal or web based partner systems. The automated workflow segments can be triggered by specific business events in the life span of the extended transaction or can be scheduled on a repeating frequency.

Automated alerts (via e-mails, Instant Messages, Beeper/cell-phone text messages, Net-Meetings with whiteboard sharing) can be set to inform people about transactions waiting for their review and input. An audit trail is available to trace processing of any business transaction across many workflow segments. All user interaction with the transactions is browser based and is subject to permissions granted to each user.

As an example, a simplified version of the business decision-making workflow segments (shown by arrows) inside a mortgage bank and its equivalent wizard defined version in W.A.R.N. Continuity is shown below.

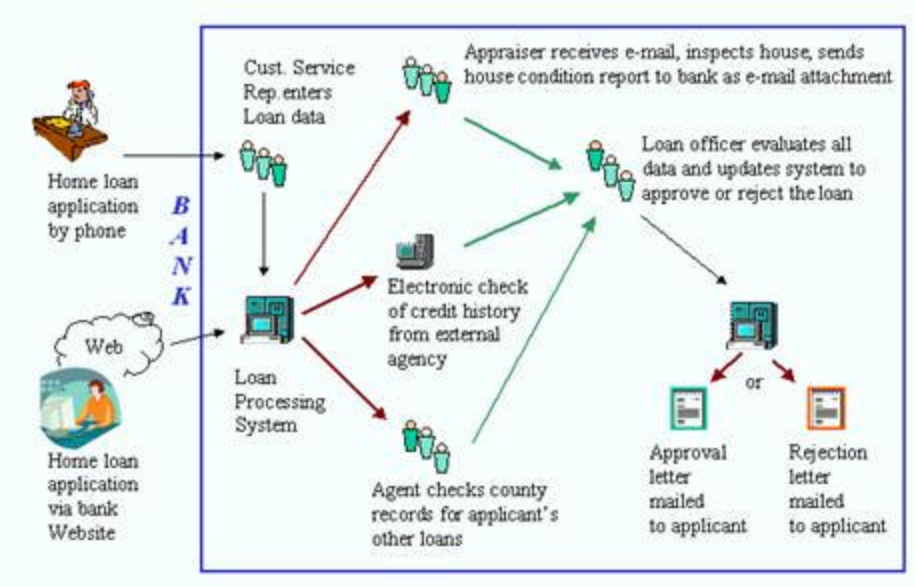

Figure 1: Workflow

W.A.R.N. Continuity's automated process will retrieve real-time data as follows:

- Map of reported accident location from US Census Bureau Web servers
- Evacuation/Isolation guideline for the reported chemical from the Emergency Response Guidebook available on the Department of Transportation Web site
- Location of police cars and fire trucks from GPS feeds (continuously updated)
- Wind speed and direction from National Weather Service Web servers

Insta-Visualizer™

W.A.R.N. Continuity is able to combine all this data to show the composite image on browsers on desktop and hand-held devices. Data layers of the image can be made clickable to drill down into related details. Each user can decide to hide or show as many data layers as are appropriate for their needs. The image can be set to refresh automatically every few seconds, if needed.

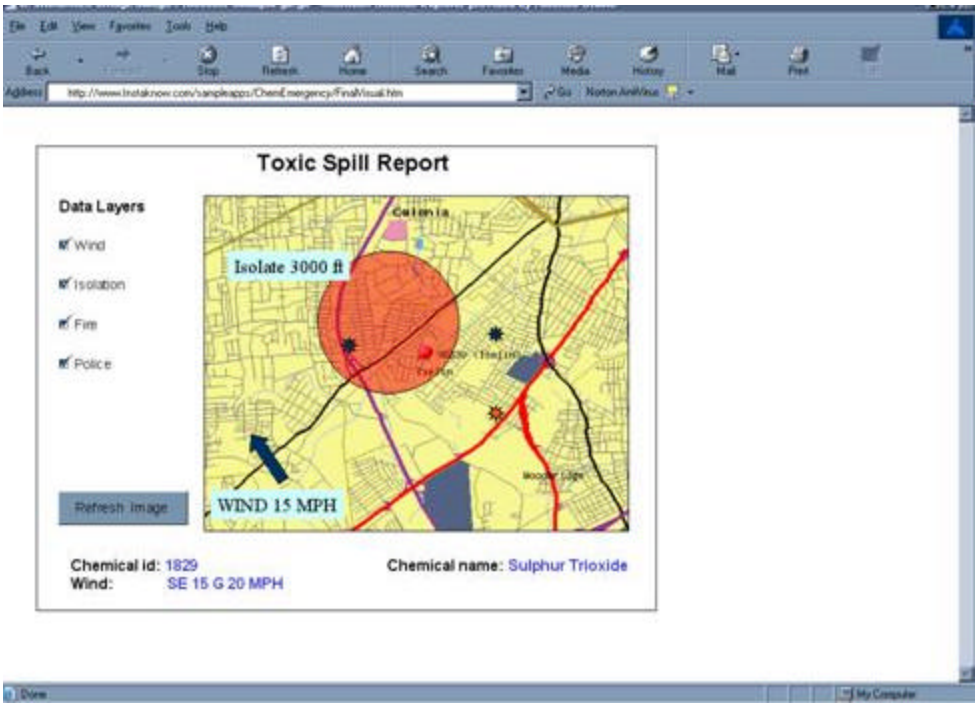

Figure 2: InstaVisualizer

The composite image and related text data can be viewed by remote parties (or can be pushed automatically to them as an alert by the system) via Web pages, Net Meetings, Instant Message or e-mail attachments. While the above example dealt with geo-spatial data interpretation, any other sets of data can be merged to visually see cross-relationships of various complex factors by combining real-time data from multiple diverse systems.

Technology Deployment

Once defined (or modified) using the visual wizards of the "designer" modules, W.A.R.N. Continuity applications are saved automatically as special encrypted XML files. The business logic saved inside these XML files can be executed by W.A.R.N. Continuity supplied "execution engine" in a silent (i.e. background or invisible) mode. W.A.R.N. Continuity's "execution engine" is similar in concept to the "Java Virtual Machine (JVM)" concept. The "execution engine" software can be installed on any machine with a Microsoft Windows 32 bit operating system (i.e. NT, 2000, XP, 98), which may also be used as Web servers, LAN servers, or desktops/laptops. Therefore, any business process automation application can be deployed on ANY Microsoft 32 bit OS machine just by copying the Instaknow application XML file to that computer, as long as the "execution engine" is present on that computer. This "application as XML" paradigm allows remote application deployment, fixes and upgrades from anywhere in the world over the Internet by transferring the application XML file via FTP, as an e-mail attachment or simply as a file system file copy to the destination computer over the LAN/WAN. The saved applications can be triggered by a "requestor" event or transaction via HTTP requests originating from HTML browsers or XML systems, via Web Service protocols, via messages coming in through TCP/IP sockets, via messages arriving in a message queue (e.g. MSMQ or MQSeries), via a direct "call" from client-server applications or via an Instaknow supplied scheduler for repeated execution at a certain frequency. W.A.R.N. Continuity's architecture allows defining synchronous (real-time) or asynchronous transactions. The requests for these transactions are added to "processing queues" by the "requestor" applications. A queue can be defined to be attended to by either other applications with specific business intelligence or by human operators with a specific "role". Processing of one request may spawn multiple additional synchronous / asynchronous requests

to be added to other queues. The entire multi-step workflow definition can be created and modified by just configuring wizards. No programming is necessary.

To process the requests sitting in the queues, any number of W.A.R.N. Continuity "execution engines" can be started on one or more CPUs and one or more servers. Each engine is set to process a particular queue. Multiple engines can be set to process transactions in the same queue if a large number of concurrent requests are expected. Since the "execution engines" are "federated" with each other, they can be started and shut down on the fly, without interruption to the processing because other engines continue to pick up the workload for that queue automatically. A "load balancer" automatically identifies the best available "queue" for every transaction and routes the transaction to that engine. Supported load balancing mechanisms are: "Least-busy queue", "Least-recently-used queue", "Round-robin selection from all available queues" and "Queue Specified by requestor".

This architecture allows unlimited scalability (by simply starting more "execution engines" when needed) and redundancy (by simply ensuring that some of the "execution engines" dedicated to a given queue are running on geographically distributed servers). A "Queue Monitor" console shows a real-time graphical view of the entire synchronous and asynchronous workflow execution. All components are protected by "role based" user-id / passwords.

Additional Advanced Features

Using additional Visual wizards, all applications built with W.A.R.N. Continuity allow:

- Complete compliance with "Web Services" architectures. Any W.A.R.N. Continuity application can be exposed to outside partners and customers as a "web service", subject to business permissions and authorizations. Web Services offered by others can be invoked by a W.A.R.N. Continuity application.
- Connectivity with Unix/Linux machines via TCP/IP, Message Queues, or HTTP
- Execution from another program and call other W.A.R.N. Continuity applications as a sub-function
- Programming extensibility using logic written in VBScript language, including calls to third party software, stored procedures, APIs of Enterprise Resource Planning (ERP) systems, Business Intelligence (BI) systems, Content Management, and Customer Relationship Management (CRM) systems
- Operations in a real-time transaction mode, or on pre-determined frequencies, using a built-in Scheduler
- Ability to specify sorts, filters, comparisons, assignments, summarizations, aggregations on all available data sources. Regular Expressions (REGXP) support
- Ability to accomplish mathematical, logical, and comparison operators and date/string operations
- Remote deployments by simply copying one flat file to destination computer, enabling fast scalability and simple Disaster Recovery Planning.
- Wizard-driven data solution that reads and writes to/from databases, spreadsheets, Visio diagrams, Word and PDF documents.
- "Self-correcting" applications that automatically "refresh" themselves with updated versions of business workflow
- Real-time transaction control - locks, rollbacks, commits on relational databases
- Permission/authorization controls for user ID using roles
- TDEA encryption for all application logic and passwords, making it almost impossible for anyone to steal business intelligence or data. Compatibility with SSL and PKI.
- Application migration and version control
- "Fail-safe" transactional load balancing with "Least busy", "Least recently used", "Round robin" and "requestor specified" methods