1. Product Overview

MEGA 2005 is a repository-based modeling environment designed for business process modeling and enterprise architecture programs. As summarized in Table 1, and illustrated in Figure 1, MEGA 2005 consists of three main products – MEGA Process, MEGA Architecture, and MEGA Designer – each of which is designed to support different users’ needs and project requirements.

MEGA Process is a business process modeling and analysis tool for defining, understanding, and documenting processes, organizational structures, procedures, and tasks. MEGA Architecture is used to describe how IT operations support the associated business functions. MEGA Designer complements the MEGA Process and MEGA Architecture tools with a UML-based modeling environment that supports service oriented architecture, database architecture, and object component-based design.

These three main products can be used individually or combined. When used together in conjunction with other MEGA modules, these tools provide an open platform that supports business process modeling, enterprise architecture, IT architecture and component analysis, and systems design efforts.

MEGA is suitable for top-down or bottom-up enterprise architecture projects. It provides modeling languages adapted to each EA audience and links them to one another for traceability and impact analysis via the MEGA repository.

Other features include simulation and animation capabilities and automated documentation generation, including the ability to generate fully functional websites and dashboards for disseminating models and
MEGA also features facilities for creating standard models and templates, and offers several pre-built models and templates for use with the tool set, including ITIL and eTOM.

MEGA supports various enterprise architecture frameworks and business process methodologies; these include pre-built templates companies can use to quickly create project websites for assisting with Zachman, TOGAF, FEAF, Six Sigma, Balanced Scorecard, and other initiatives.

MOKA, MEGA Open Kit Approach is an embedded methodology framework that contains predefined modeling methods. They can be applied to business process analysis and enterprise architecture projects, and can be customized to suit team and company requirements.

Finally, MEGA 2005 is based on the Object Management Group’s (OMG) Meta Object Facility (MOF). Thus, end-user organizations can extend its functionality to support just about any kind of modeling, methodology, design, documentation, and language generation requirements.

<table>
<thead>
<tr>
<th>Table 1. Overview of MEGA 2005</th>
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<tr>
<td><strong>MEGA Process</strong></td>
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<td><strong>MEGA Architecture</strong></td>
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<td><strong>MEGA Repository</strong></td>
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MEGA Publisher

Administration module that provides automated document generation capabilities in multiple formats, including MS Word, HTML, and RTF, to automate the generation of Word documents and Web sites with hyperlinks and drill-down capabilities.

MEGA Exchange

Administration module that provides text-based import/export facility (for any repository object); XMI import/export facility for UML models; Rational Rose import/export facility for all UML models, including diagrams. Also provides Erwin, Sybase PowerDesigner import, and BPEL export. MEGA Exchange also adds language generation capabilities to MEGA Designer, including Java, VBX, XML (including XML schemas), and SQL. Also provides a COM-based API with full read-write capabilities and VBA integration.

MEGA Supervisor

Administration module that provides maintenance of security and tool/repository authorization facilities.

Pre-built Models & Templates

Basel II Risk Type Library for financial institutions, ISO 9000 Chapters, Balanced Scorecard, Six Sigma, ETOM, and ITIL.

2. Product Architecture

2.1. Architecture Overview

Figure 2 gives an overview of the MEGA product architecture, which consists of three main components: Repository, Modeling Desktop, and Publisher.

![Diagram of MEGA product architecture](Diagram)

The three main products – MEGA Process, MEGA Architecture, and MEGA Designer – provide metamodels, diagram types, and templates for each specific business process analysis or enterprise architecture audience. When combined, these tools form a single integrated Modeling Desktop combining all models. Thus, although available as separate products, when integrated, they can natively create connections between the different models for traceability and impact analysis because they all utilize the same Modeling Desktop and Repository.

MEGA products can be deployed in three different architectures:

- **Stand-alone workstation**: Programs and repository are installed on a workstation. This does not allow users to exchange data with other users except through file exchanges.
- **Client-server**: Programs and repository are installed on a file server. Programs are either copied locally on workstations, or workstations are configured to run MEGA from the network.
- **Thin client-server**: Programs are installed on an application server, and the repository is installed on a file server. This architecture is recommended for work groups distributed across different sites.

### 2.2. Usability and User Interface

MEGA modeling tools support both general business users and technical analysts. MEGA Process is intended more for general business users, while MEGA Architecture and MEGA Designer are more for technical users like IT architects, integration architects, data architects, project managers, and systems designers. However, all models are connectable because they share the same repository and the same Modeling Desktop.

MEGA tools are Microsoft centric. They all utilize the same MEGA Modeling Desktop – a standard Windows-based application adhering to the MS Office paradigm. As shown in Figure 3, all menu items are organized as standard Windows menus, with action items, copy/paste, and properties. Property sheets are organized with standard tabs. All object property sheets have standard “General,” “Characteristics,” and “Comment” tabs. In addition, each property sheet includes embedded help on objects, attributes, and link definitions. Help text is derived from metadata definitions available in the MEGA Repository.

![Figure 3. MEGA Desktop Interface](image-url)

MEGA’s integrated modeling environment desktop provides methodology and online assistance to all types of users thanks to a dedicated welcome/support page (Figure 4) from which diverse information can be accessed, such as product online help, methods description, and wizards for project/diagram creation.
MEGA’s diagramming interface (Figure 5) provides a graphical modeling environment utilizing the popular swimlane format. It, too, adheres to all the features available in standard MS Office products for inserting objects, moving shapes, drawing links, and so on. The tool also features a Diagram Editor that provides advanced graphics capabilities for diagram creation. This includes a rich shape library end-users can extend with a shape editor to create their own modeling and diagramming conventions.

The MEGA Modeling Desktop also offers advanced object navigation, wherever objects are made accessible to users. Users can take advantage of a various views of their objects and models, including

- A Navigator that offers a structured organization of objects, projects, diagrams, keywords, and methodologies. Users can customize the Navigator and create diverse object hierarchies as well
- An Explorer (available via any object menu) that provides advanced navigation among object links and spreadsheet-like multiple object and data entry
- A Diagram Viewer for fast preview and navigation among diagrams
- A Query Editor and wizard whose engine can handle simple to complex queries for retrieving any object available in the repository. (This includes ready-to-use queries that can be made available to users to speed up their productivity.)
- A Matrix Editor that enables easy cross analysis of objects and relationship editing
- Keyword taxonomies that can be created for classifying model elements according to user criteria

MEGA Publisher provides users with various documentation capabilities, including automated document generation in MS Word and HTML, and the ability to generate websites and dashboards for communicating business process, enterprise architecture, and simulation models to viewers and decision makers.
2.3. Repository Options/Team Development

MEGA repository is based on the MOF kernel (according to OMG specifications for metadata and repository). It can support an unlimited number of users, and provides check-in/check-out facilities and private workspaces and impact analysis for multi-team development. This is accomplished via use of supplemental configuration management tools.

Access to MEGA Repository is user-based and controlled by name and password (a unified login is also available via single sign on), with access to sensitive features controlled according to user profiles. Modeling objects, organized as a hierarchy, are protected by access rights. Administrative tools are provided for administrators to apply access rights at any object granularity. (For more on administration, security, and concurrent access management, see Section 9.1.)

All objects stored in MEGA Repository have a comment property. An available comment editor supports rich text format and includes a spell checker. Repository browsing capabilities are provided by MEGA Explorer (as discussed in previous section).

Because it is based on the OMG’s MOF, MEGA Repository is completely extendable and offers considerable customization capabilities, including:

- Metamodel customization: Includes the ability to create new attributes and concepts and define new associations between concepts. This metamodel customization standard feature is graphical and provided through a class-diagram-like interface where users can customize meta-classes, meta-relationships and their attributes.
- Diagram type customization: Includes the ability to create new diagram type extensions and new diagram types
- UI customization: Includes the ability to create custom object shapes and icons and customer object menus and tabs
- Navigation Tree customization: Offers customized entry points to repository content in the Navigator
MEGA’s customization capabilities provide end-user organizations with the ability to configure MEGA tools to meet their needs, including the ability to create custom queries, custom matrixes, custom document templates, custom website templates, custom scripts, and document generators.

Other features include automatic laptop synchronization for remote/nomadic offline users as well as a variety of pre-built metamodels, which are available for ISO 9000, SAP/R3, and PeopleSoft.

### 2.4. Integration with Other Products

MEGA Suite provides various APIs and import/export formats that allow integration/interoperability with other products.

For third-party tools integration, MEGA embeds the following components:

- SCCI interface to configuration management systems and other SCCI compliant tools
- A spell checker from WinterTree Software Inc.

The MEGA Exchange module provides several import/export facilities, including:

- Text-based import/export facility available for any repository object. It automatically selects the appropriate set of objects to extract according to links between objects and link semantics (i.e., ownership, reference, etc.)
- An XMI import/export facility for UML models
- A Rational Rose import/export facility for all UML models, including diagrams
- A BPEL export
- An Erwin import
- A Sybase Power Designer import
- A Visio import
- An ARIS import

A Microsoft COM and .Net compliant API is provided for access to all repository objects, including meta-objects from the MOF structure.

The MEGA Designer tool uses ODBC to connect to relational databases and for reverse engineering their relational schemas. In addition, MEGA Designer can generate BPEL from workflow models and XML schema from class models.

## 3. Analysis and Process Modeling

### 3.1. Enterprise and Organization Models

#### Enterprise Architecture Models

MEGA provides standard support for the Zachman Framework and Balanced Scorecard enterprise architecture models. MEGA also comes with an HTML service that provides a Zachman portal interface to the MEGA repository. This portal provides advice on how to apply best modeling practices in MEGA according to standard guidelines provided by the Zachman framework.

Concerning framework (and methodology) support, MEGA is very extensible. The MEGA Open Kit Approach (MOKA) provides an integrated and open methodology framework that can host any enterprise architecture/methodology to guide user activities during project modeling efforts. Consequently, should companies want to utilize specific methodologies (e.g., TOGAF, IDEF, LOVEM, etc.) to support their efforts they can do so using MOKA.
Organization Models
Organizational analysis is one of the primary business modeling perspectives supported by MEGA Process. To support modeling of organizational structures and the relating of business processes to organizational units, MEGA provides the ability to create

- Organizational charts that link business processes and the persons responsible for their control
- Site charts that link business processes to the locations where they are implemented in the enterprise
- Organizational viewpoints of business processes with Org-Units defined in swimlanes
- RACI analysis for defining Org-Units’ responsibilities in terms of tasks and operations

Besides the ability to define an organizational view of business processes, MEGA also provides a functional view to create a view of business processes that is valid for any kind of organization. For example, very large organizations may want to normalize the functional view of their core processes, but usually they have different organization structures in each country, due to history, culture, regulation, or outsourcing policy.

Functional and organizational views of business processes can be linked to each other to derive various measurements and to support ABC investigations (discussed below).

Resource and Cost Modeling
MEGA Process supports two dimensions for resource analysis – business function analysis viewpoints and organizational viewpoints.

The business function analysis viewpoint describes the enterprise skill set as a hierarchy. Business functions are consumed by activities in business processes. This analysis provides the basis for ABC projects.

The organizational viewpoint describes two kinds of resources – non-IT resources and IT resources. Non-IT resources can be categorized and have specific cost and time attributes in the simulation module. IT resources have a transaction point cost. IT resources can also be further analyzed in IT architecture models or used as resources in business process models.

Mapping Organization Strategies to Performance Measures
MEGA offers several options for representing performance strategies and goals, including value chain analysis and Balanced Scorecard. (Other representations can be added.) Each of these can be mapped to the process areas and processes; the relationships defined throughout the models are propagated up to the strategy level.

MEGA supports project analysis for both strategy analysis and action plans. Strategy projects use Balanced Scorecard perspectives to organize goals into cause and effect chains.

MEGA also supports the simulation of processes and the linking of simulation results with organizational project goals and strategies (See Section 3.4).

MEGA also supports issue analysis through fishbone diagrams (AKA Ishigawa diagrams).

Managing Enterprise Information and Data Assets
MEGA also provides additional capabilities for enterprise architecture alignment using the MEGA Business Data component, which is designed for managing enterprise information and data assets.

Business Analysts and IT Architects want to understand an enterprise's data assets in order to build a common data architecture aligned with enterprise business activities. MEGA Business Data helps business modelers capture the information and data business people use in the course of their activities. Basically, MEGA Business Data provides them with easy to use notations (e.g., IDEF&X, IE, class
diagrams, etc.) to create Business Data Models that are used as a basis to define the business vocabulary, the data, and application dictionaries.

Used with MEGA Process, MEGA Business Data links business data models to business processes to describe where business entities are used or required by business activities and business rules.

Used with MEGA Architecture, MEGA Business Data links business data models to application architecture models to describe which parts of the IT system are responsible for managing enterprise data assets.

MEGA Designer then links business data models to physical data models. So that MEGA covers the entire information architecture activity, down to the generation of complete SQL scripts when required.

Data consistency rules ensure and potentially enforce the respect of information and data modeling standards.

MEGA Business Data supports multiple data modeling notations, including standard Data Diagram, IDEF1X, and Information Engineering (IE).

Managing Process Portfolios

Process portfolios are managed in MEGA Repository, which can handle up to hundreds of thousands of processes. MEGA's simulation engine can be used for vertical or horizontal analysis of large process value chains. Process portfolios can be managed on a per-owner, per-project, per risk level, per timeframe basis. Impact analysis and automated document generation provide stakeholders appropriate views and analyses of their process portfolios in dedicated deliverables.

3.2. Defining Processes

Defining Processes

In MEGA, processes are described through the tool's graphical diagram editor. It is also possible to use the dialog editor for tabulated inputs when required, or, preferably, the explorer component that provides a spreadsheet-like entry point.

How is Its Information Storage and Integrity

All models are stored in MEGA's MOF-compliant repository, which ensures consistency according to the appropriate business process metamodels. (For more on MEGA Repository features and system administration/security, see Sections 2.3 and 9.1.)

Graphical Notations

MEGA Process supports three views of business processes – functional, organizational, and IT. These three views can be linked together using the OMG's MDA approach. Each view provides flexibility in that the types of objects visible in each view can be adapted to the user's requirements.

The MEGA tool provides an open model editor, which includes a shape editor that allows users to define an entirely new set of shapes for each business process object. Further customization is also available for modifying the diagram behavior, or even to create a completely new business process diagram.

BPMN is supported in MEGA Designer for designing IT processes and is to be extended to other domains in upcoming versions.

MEGA does not support UML 2.0 Activity diagrams. However, MEGA is a submitter at the OMG for the Business Process Definition Metamodel (BPDM). BPDM aims to provide a business view of Activity Models and a way to link business models and IT models, according to the MDA approach. Thus, it is reasonable to expect that subsequent versions of MEGA will support BPDM.
3.3. Subprocesses and Activities

Handling Subprocesses and Activities
In MEGA, processes and activities can be decomposed without any limit. Besides simple decomposition (i.e., subprocesses), MEGA Process provides the ability to connect process functional analyses (activities) to process organizational analyses (procedures). In addition, advanced control flow is provided for activity flows, including decision boxes. Decision flows have guards and probabilities.

Defining Activities
In MEGA, activities and tasks can be connected to Use Cases so that business requirements defined by business activities are transferred to Use Cases for further refinement to specify software components.

Documenting Decision Rules
Constraints can be used to express business rules. Constraints have a rule expression that can use business dictionary terms from business data models. Using the standard MEGA documentation features, such rules can be documented in the form of decision tables, if needed.

Rules Entry
See above.

Activity Costs, Resources, and Time Data
MEGA supports ABC – the ability to add activity-based costs to business processes. These can be assigned to individual activities or to the whole process. Users can also assign costs based on whether they are for execution, transfer (in the case of a message – information, control or goods flow description), or processing. Various approaches can be adopted for calculating costs, including the duration of the activity or process, its physical cost, and/or human and other resource cost requirements. In addition, beyond standard time and cost attributes, MEGA’s simulation module provides advanced features for analyzing activities based on custom performance criteria.

3.4. Simulation

Simulation Capabilities
MEGA Process features a Discrete Event simulation engine that provides a number of simulation capabilities, in beginner, standard, and advanced modes. Simulation capabilities default to time, cost, and resource management. Simulation capabilities include

- The ability to define simulation scenarios, with custom objectives and indicators
- The ability to conduct simultaneous simulations of multiple scenarios
- The ability to manage simulation scope in terms of breadth and depth, and the ability to target optimization of a local business process or a global value chain
- Advanced distribution laws
- Total control for activity flows
- Queue management
- Objectives and indicators for applying advanced metrics from simulation results
- Advanced calendar capabilities for portraying human resource availability and business process event frequency

MEGA Simulation allows MEGA Process users to create multiple simulation scenarios for the full spectrum of processes, ranging from isolated business processes to entire value chains of processes. A comprehensive set of parameters is provided for adjusting resource consumption and for defining organizational constraints. By applying indicators and customizable metrics, users can link MEGA simulation results with a project’s objectives.
Analytic Capabilities
MEGA Simulation’s analysis features include tools for analyzing and summarizing simulation data and for applying various metrics.

MEGA enables aggregation of simulation results as a function of analysis requirements:

- At the elementary level, results are related to indicators that monitor each business process or procedure
- At the global level, results are related to consolidated indicators, enabling the aggregation of elementary results using simple user-defined calculation rules

Upon completing a simulation, MEGA generates an execution report documenting the simulated steps and any inconsistencies in the model. A resource load consumption table is also generated. All results are stored in the repository for use with other MEGA facilities (Web/Document Publisher, etc.). Users can also export results to Excel for further analysis.

MEGA Simulation also features the ability to animate simulation scenarios in step-by-step, pilot, or automated mode. It will walk the user through the entire process and subprocess chain, providing an overview and control of the simulated business processes and activities.

Real-time Data Utilization
MEGA Simulation can import data from Excel spreadsheets or from XML files. It also integrates with the Armstrong-Laing METIFY product, which supports real-time data feeds into process models for simulation.

Model Distribution and Simulation on Enterprise Networks
MEGA Simulation features a dashboard capability for defining dashboard criteria for decision makers or project teams. Companies can also use the website template (provided in standard) designed for business optimization projects to deliver simulation scenarios and results to project members. Many companies will want to integrate this project optimization website into their corporate intranet.

Statistical Fit/Data Analysis
MEGA Simulation analyzes simulation results by applying indicators and other metrics based on mathematical formulae. Formulae range from standard Excel formulae to complex user-defined Visual Basic algorithms, which could indicate, for instance, the number of processed orders, number of rejected orders, average processing time, delivery time, and so on. Users can also export simulation results to Excel for more advanced statistical analysis.

Capture and Reporting of Simulated Metrics
MEGA Simulation provides standard documents (Word, etc.) and website templates to automatically deliver simulation reports. Simulation results are provided as tables and graphs for better readability.

MEGA includes an innovative simulation feature that allows users to analyze simulation results in relation to process improvement objectives. This alignment of simulation results with target objectives provides a powerful tool to associate objectives with a simulation scenario and to associate indicators with an objective (e.g., required value, corresponding value at warning threshold, etc.). For example, if you want to reduce delivery time, the “delivery time” indicator could have “7 days” as its required value and “10 days” as its threshold value. MEGA Simulator also automatically generates a summary report that includes an indicator graph presenting simulation results related to objectives, in effect, providing a “global view” of the executed simulation.
4. **Business Process Methodologies**

4.1. **Business Process Methodologies**

MEGA includes a set of ready-to-use methodologies, including MEGA’s own approaches for business process modeling, application architecture, and application design. Standard methodologies such as Balanced Scorecard, Six-Sigma and TOGAF are also provided. For each deliverable that involves a business model, there is an associated template in the modeling framework.

The MEGA modeling platform is also designed to enable users to configure the tool to support whatever approaches they desire. For this purpose, it includes a framework (MOKA) that is dedicated to methodologies. This framework is composed of:

- A metamodel for methodologies (e.g., method, phase, resource, deliverable, etc.)
- A diagram for designing method phases and deliverables
- A project creation wizard for starting a modeling project according to a methodology template
- Website templates to generate both a methodology website and a project website

The MEGA methodology framework, combined with the tool’s MOF repository, provides an embedded and powerful set of guidelines and features for conducting modeling based projects. In effect, meta classes, diagram types, document templates, and website templates are all objects stored within the repository, thus allowing them to be linked to a method’s deliverables.

MEGA has used the MOKA framework to incorporate specific methodologies within its toolset. These include Six Sigma, Balanced Scorecard, TOGAF, and MEGA’s proprietary business process modeling and enterprise architecture methods.

4.2. **Six Sigma Support**

MEGA has made a concerted effort to fully support the Six Sigma methodology in the latest version of MEGA Process: All phases, deliverables, and required resources (e.g., black belt, green belt, etc.) are fully described.

MEGA also provides an HTML template that companies can use to create quickly a Six Sigma project portal that makes available to project collaborators all data and project documentation (e.g., project steps, resources, models, external documents, etc.) relating to a Six Sigma project. This portal enables access to the various projects created in MEGA, as well as the creation of new projects from the HTML interface.

5. **Report Generation and Document Management**

MEGA Publisher supports document template customization within is one of the MEGA modeling platform. It includes two components – Document Publisher and Web Publisher.

Document Publisher provides a GUI to MS Word for extracting information from the repository in the appropriate layout. It also allows administrators to design high quality document templates that are then used by standard modelers for automated document generation.

All MEGA products come with a set of ready-to-use document templates such as “Business Process Definition Document,” “ISO 9000 quality manual,” “Org-Unit Job Description,” “Application Description,” etc.

Users can also email documents created within MEGA. The publishing service uses the distribution list to attach to the document in the MEGA repository. This service provides users with a way to initialize a validation workflow directly from MEGA.
Web Publisher provides a complete architecture for designing and generating project websites, including these modules:

- **Object exporter**: Used throughout MEGA for automated discovery of the network of objects connected to a root object. Using object exporter, any repository object can be used as the source for a website.
- **Web page template editor**: Provides a way to describe the web page layout associated to each object type
- **Website template editor**: Provides a way to select the root objects that will be part of a website, as well as which page layout template should be used for each desired object type
- **Website generator**: Uses website templates, web page templates, and the object exporter to build fully featured websites, compliant with client needs

Recent additions to MEGA publisher include the possibility for any end-user to design and generate documents on the fly, while the system silently makes and stores the corresponding document template for future reuse by all users.

6. Development Environment

6.1. Language of Tool

The MEGA platform was developed using Microsoft Visual Studio 2003. Languages used include C, C++, VBX Scripting, and HTML.

The installation program is based on InstallShield X. WinterTree provides the spell checker. Lex&Yacc is used for parsing Rich Text Format (RTF). PKZip is used for repository data compression.

A large set of the product’s features use the repository’s MOF kernel and the generic engines underlying the platform. All metamodels, diagram types, property tabs, menus, and queries are declared objects in the repository, meaning customers can natively extend them to meet their needs.

6.2. Product Support, Maintenance, and New Versions

New product versions are released yearly. Major version updates (called Service Packs) are released once or twice a year. Minor updates are provided as cumulative patches. All updates are provided as packaged setup programs.

MEGA provides worldwide technical support, with regional support centers located in Paris and Boston. MEGA technical support provides

- Telephone support during local business hours
- Email support during local business hours
- Online support via support Website
- Escalation process (i.e., calls upgraded to the appropriate engineers/developers) depending on severity and complexity
- Updates – Customers can download latest releases
- Fixes – Customers can download latest Services Packs
- Online customer service – Customers can log, monitor, and update calls via the Internet

A central online knowledge base providing advanced queries for troubleshooting problems is available on the support web site.
7. Software Modeling and Code Generation

MEGA Designer supports application component, data, and integration-design and integrates with standard development environments. It also provides code generators as outputs for use with development projects when architecture/design projects have reached their advanced phases.

MEGA Designer includes a full implementation of UML 1.4 models. UML metamodels (created in Designer) are linked to business process metamodels (created in MEGA Process) and IT architecture metamodels (created in MEGA Architecture). As a result, the combined toolset provides a comprehensive model driven approach for enterprise architecture design and modeling.

MEGA Designer supports generation and reverse engineering of different source components including:

- BPEL code generation from workflow models
- XML schema generation and reverse engineering from class models
- C++, VBX, Java bean and Java code generation and reverse engineering from class models
- SQL code generation and reverse engineering for relational models
- Automatic synchronization of relational models with class/association models

7.1. UML Model Generation

MEGA Designer includes a full implementation of UML 1.4 models.

7.2. BPEL Generation

MEGA Designer generates BPEL code from workflow models. A BPEL generator is also embedded in MEGA Exchange.

8. Templates and Frameworks

MEGA provides standard libraries whenever those frameworks have enough stability and clarity both in terms of content and in terms of metamodels.

MEGA currently provides the following standard libraries:

- Basel II Risk Type Library: Includes a standard list of risk types and parameters as defined by the Basel II committee for risk assessment for financial institutions
- ISO 9000 Chapters: Includes a standard list of ISO chapters and parameters for quality management and certification
- Six Sigma Methodology artifacts and templates
- Balanced Scorecard Methodology artifacts and templates, including perspectives
- ITIL (Information Technology Infrastructure Library)
- eTOM (Business Process model for the Telecom industry)

Large customers such as British American Tobacco have implemented the SCOR model in MEGA. However, according to MEGA representatives, they have not found agreement during business consulting engagements regarding the definition of business processes, business functions, and business collaboration among the SCOR community and other modeling tool vendors. Consequently, MEGA has chosen to implement the SCOR framework according to each customer requirement via its consulting teams.
MEGA is also working with the TeleManagement Forum to help rationalize the specifications for the TeleManagement Framework using the new Business Process Metamodel under development and the OMG’s Model Driven Approach (MDA).

9. Systems Administration and Security

MEGA provides advanced features for teamwork management, security management, and enterprise repository management.

Transaction and Private Workspace. The MEGA Repository provides features that enable users to work in private transactions through private workspaces:

- Users have access to the entire repository in the state available at the time they started a private transaction, and depending on their access grants.
- Users can update their models privately without showing these updates to other users.
- Users can refresh their private workspace from the latest state of the public workspace while keeping their private updates.
- Users can dispatch their updates to the public workspace when they have finished their work, or they can discard their private updates when they are not satisfied with the work being done.

Object Access Rights. The MEGA Supervisor Module includes an access rights service to secure and track object changes:

- An administration console provides graphical management of user access rights.
- An access rights hierarchy provides permissions for a set of users.
- Users can only update objects for which they have permission rights.
- Administrators can change permissions associated with each object by assigning to them a higher or lower security level.

User Profiles. User Profiles enable the administrator to control access to the modeling desktop features. User Profiles define

- A level of object access rights
- Restricted views of the metamodel
- Restricted access to administration options (object deletion)
- Restricted access to design tools (simulation, data model alignment)
- Restricted access to products (MEGA Process, MEGA Architecture, MEGA Designer, etc.)

Unified Login. MEGA supports the Single Sign On (SSO) protocol that offers unified login and advanced security for user authentication and password management.

Version Management. MEGA’s version management features include

- An export tool that can export any repository object and its components into an external file
- A comparison tool that can compare an exported repository object and its current state in the repository
- A merge tool that can select and align a repository object according to an exported version
- The ability to export files that can be stored automatically in change management system through the SCCI interface
In addition to the software tools just described, MEGA also provides an accompanying enterprise repository management methodology designed to help companies build their organizational structure for a successful enterprise repository implementation.

10. Scalability

**Volume Scalability.** MEGA can handle repositories starting from a single modeler up to hundreds of modelers working simultaneously on the same repository:

- Number of users: unlimited
- Users working simultaneously on single repository: 512
- Number of objects in a single repository: about 4 million
- Effective content volume: from 512K to 4GB
- Required disk volume: from 512MB to 10GB

**Deployment Scalability.** The MEGA platform provides three deployment models – stand-alone workstation, client-server, and thin client-server. (See Section 2.1 for more on deployment options.)

**Silent update.** Once deployed, the MEGA client workstations can be silently updated upon upgrades thanks to an automated pull mode.

**Low bandwidth.** In case of low bandwidth networks, MEGA's local cache allows users to minimize network traffic.

11. Platforms

MEGA is available for Windows operating systems, including Windows 2000 (with MS Office 2000) and Windows XP (with Office XP). Repositories can be hosted on Unix servers including Linux.

12. Pricing

MEGA Software is composed of analysis and modeling products as well as various add-on options and technical modules for customizing and administering the repository and end users.

MEGA Software is sold either through fixed (i.e., per workstation) or concurrent user access licenses. Maintenance includes technical support for product use and major new version upgrades. Maintenance and support fees are equal to 18% of total price.

**Eight-User License for BPA Project for MEGA PROCESS (alone)**

For 8 users the standard configuration is the following:

- 8 MEGA Process
- 1 MEGA Administration console (including Publisher)
- Total: 25,200 euros

This configuration (as well as others described below) provides the ability to deploy the enterprise repository (generated by MEGA) to all company stakeholders, regardless of their number.

**Eight-User License for Enterprise Architecture Project**

For 8 users the standard configuration is

- 6 MEGA Process
• 2 bundle product, MEGA Process + MEGA Architecture
• 1 MEGA Data option (data modeling)
• 1 MEGA Administration console (including Publisher)
• Total: 27,000 euros

**32-User License for BPA Project for MEGA PROCESS (alone)**
For a 32-user system, the configuration is

• 32 MEGA Process
• 1 MEGA Administration console (including Publisher)
• Total: 56,925 euros

**32-User License for Enterprise Architecture Project**
For a 32-user system, the configuration is

• 24 MEGA Process
• 8 Bundle product, MEGA Process + MEGA Architecture
• 4 MEGA Data option (data modeling)
• 1 MEGA Administration console (including Publisher)
• Total: 66,825 euros

**13. Company, Product Positioning, and Support**

**13.1. Company Background Information**

With North and Latin American headquarters in Sharon, MA, MEGA International is a global provider of business process management and enterprise architecture solutions. MEGA’s value-driven approach combines proven methods, modeling software, and consulting to deliver an enterprise repository to the client. This repository provides executives and operational managers with the ability to understand, discover, align, and control information at the enterprise level.

Founded in 1991, MEGA is an active contributing member to the OMG, and provides solutions for Fortune 2000 companies, several of which are in the Fortune 100, with over 1,500 customers and 35,000 licenses in more than 40 countries worldwide.

MEGA has worldwide offices located in the USA, Canada, Mexico, Germany, France, Italy, the Netherlands and Japan. MEGA clients include Allianz, British American Tobacco, Cardinal Health, Crédit Lyonnais, DirecTV, Michelin, Morgan Stanley, Novartis, Renault Nissan, Enterprise Rent-A-Car, and Wyeth.

MEGA has also developed a network of strategic partners in parallel markets as well as distribution partnerships to extend its market reach.

MEGA has approximately 200 employees, with more than 100 consultants from 15 nationalities specialized in business process analysis and enterprise architecture. Annual revenues were approximately 25 million Euros in 2005.

MEGA is recognized as an industry leader by research firms, including Gartner, Forrester, and various standards organizations like the OMG and the OpenGroup.

MEGA has doubled over the past 4 years.
13.2. Positioning

MEGA has positioned MEGA 2005 to support a range of EA modeling and BP change activities, including:

- Enterprise architecture modeling and analysis
- Process modeling and analysis, redesign, and improvement
- Detailed process modeling and analysis
- Human performance improvement initiatives
- Development of management and measurement systems
- IT architecture, IT support/software development
- Regulatory compliance
- IT governance

MEGA positions its product suite to support the full spectrum of enterprise architecture and business process management needs. When used together with other MEGA modules, MEGA Process, MEGA Architecture, and MEGA Designer combine to provide a single platform that supports business process modeling, enterprise architecture, IT architecture and component analysis, and systems design efforts, while its simulation capabilities support detailed process modeling and analysis. The addition of various frameworks and methodologies – including Zachman, Balanced Scorecard, and Six Sigma – make it well suited to support human performance improvement efforts and to develop management and measurement systems. Finally, the pre-built templates provide project management capabilities that companies can use to create quickly websites for assisting with various enterprise architecture and business process management initiatives.

13.3. Product Training

MEGA offers various product training and product support services. Training sessions can be conducted on customer sites for a group of 8 to 10 participants. Training is also available at MEGA.

13.4. Business Process Consulting

MEGA offers a variety of client services including:

- Value chain management
- Business process improvement
- Operational risk management
- Business process and IT systems alignment
- Best practices selection and installation
- Quality management

MEGA has organized its industry expertise into four industry groups with consulting directors appointed to ensure customer value delivery in each of these sectors:

- Banking
- Insurance
- Manufacturing
- Services
14. Case Study

A domestic insurer for private individuals used MEGA PROCESS to identify, document, and optimize key business processes – and to standardize best practices – across the entire organization. This large insurer (with a turnover of 3.29 million euros in 2001) has 7,200 employees, 4.3 million clients, and 3.25 million insured households.

Teams. MEGA consultants worked jointly with the company’s dedicated teams to build a business process repository. The objectives of this repository project included:

- Fostering knowledge transfer and consolidating company know-how
- Facilitating the implementation of internal projects and federating them
- Preparing for the automation of processes within the context of a workflow
- Improving the quality of services delivered to their clients

Project Scope and Objective. A key dimension of the project involved taking into consideration the company’s organizational structure, consisting of the head office and 11 operational divisions (i.e., regions), which are geographically distinct and which have their own regional practices. The goal was to highlight core business processes while taking account of any specific regional requirements. The customer team was represented by ten architects who used ten product licenses to support the project.

MEGA’s Contribution. Having validated the scope of the project, the first step required designing a global map of the company’s core processes, which, in effect, defined the organization’s value chain. These processes were divided into three categories – monitoring, operations, and support – with the main emphasis focused on operational processes. These, in turn, had a special focus on subscriptions, contract lifecycles, and claim issues. Before building the repository, the customer, with “experimental” processes, tested and validated the approach that had been put together.

Preliminary results of this experimental phase were threefold. First, a unitary methodology (based both on the MEGA Process modeling tool and the MEGA process modeling approach) was adapted to the client’s needs. This resulted in a unifying project that brought together all ongoing initiatives, which, in turn, resulted in a first process, deliverable in the form of a working intranet.

To build a consistent repository that would take into consideration regional process specific requirements, the following cycle was implemented in order to define the future “to be” business process map, while involving all stakeholders through every step of the project:

An analysis of the “as is” situation (with inputs coming from one representative region) was conducted.

This analysis was compared with two or three key regions to identify differences, and, wherever necessary, a comparison with all other regions was also conducted.

Finally, a “to be” map was created based on regional best practices.

After 2 months, approximately 30 processes, 180 procedures, and 200 operating modes were designed to support the business process repository, which is considered the entry point for all subsequent strategic projects carried out by this client. As a result, ten processes have been accommodated with another five in progress. The results are accessible by all employees via the corporate intranet.

15. Company Offices

MEGA International focuses on Europe and North America with operations and affiliates in the United States, United Kingdom, Germany, France, Italy, Canada, Mexico, and recently in Central and Eastern Europe. In 2005, MEGA opened offices in the Netherlands and Japan. See website www.mega.com for a list of representatives and distributors.
MEGA North American Operations
2 Commercial Street
Sharon Commercial Center
Sharon, MA 02067
USA
Tel: +1 781 784 7684
Fax: +1 781 784 7688

North European Operations
United Kingdom
MEGA International Ltd.
Concorde House, Trinity Park
Solihull, West Midlands, B37 7UQ
UNITED KINGDOM
Tel: +44 (0) 121 635 5161
Fax: +44 (0) 121 635 5162

Central European Operations
Germany
MEGA International GmbH
EnergieForum
Strauler Platz 34
D-10243 Berlin
Tel: +49 30 2005 3699-0
Fax: +49 30 2005 3699-5
GERMANY

Italy Operations
MEGA s.r.l.
Via Della Moscova, 58
20121 Milano
ITALY
Tel: +39 02 29 01 1487
Fax: +39 02 29 01 7474

Europe Headquarters
France
MEGA International
10 boulevard du Montparnasse
75015 Paris
France
Tel: +33 (0) 1 42 75 40 00
Fax: +33 (0) 1 42 75 40 96

Dutch Office
MEGA International - Nederland
Kingsfordweg 151
1043 GR Amsterdam
THE NETHERLANDS
Tel: +31(0) 20 491 77 41
Fax: +31(0) 20 491 90 90

Japanese Office
MEGA Asia
8-37, Saneicho, Shinjuku-ku
Tokyo 160-008
JAPAN
Tel: +81 (0)3 3358 2587
Fax: +81(0)3 3358 1954