ISIS Papyrus

Focus Report

Correspondence

Of all the challenges the IT manager or CIO faces today, application integration is the most complex problem to solve and at the same time the most essential to pursue. Buying an apparently simple hardcoded letter solution using PC Text products as a text tool is a dead end solution that will come back to haunt the CIO.

Business documents can never be standalone applications as they are always tightly linked to business data and business process. Document applications tend to be one of the most complex integration projects because of their requirement for process integration. The tremendous system management and application software stack so common today has left corporate customers with a shocking legacy. While EAI, XML, and Java are commonly named as the solutions to this problem, there is little they do for business documents.

Application integration has been the most challenging issue to solve for ISIS and its customers. To solve this problem, an integration solution was developed by ISIS. The Papyrus Document System was designed to be extremely flexible and as a result, can now integrate anything with anything.

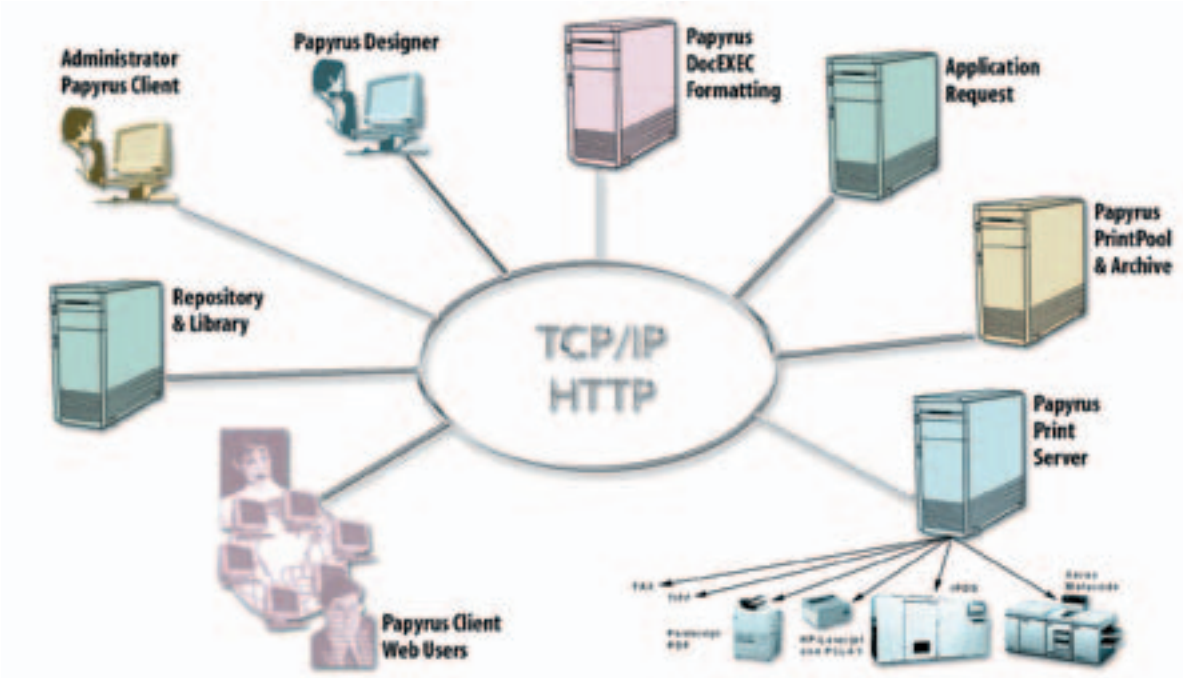
Application integration does solve the following major problems:

- Designing and coding interfaces
- A coherent approach to how the user is guided through the business process
- Managing the lifecycle of the application.

It requires support for the corporate business process in a common and consistent manner without tying the user and organization into a workflow controlled straight-jacket.

Papyrus Objects in a nutshell uniquely addresses:

- Single image Business Object GUI for all applications
- Business Process flow control with state processing
- Definable interfaces to SQL, messaging, and transaction systems
- Business document automation and management
- Resource distribution management into the Network
- Application level, role based authorization system
- Integration with archive systems, fax and e-mail
- Central Output and Print Management for distributed document applications.
- Version control manages the application lifecycle
- Concurrent and seamless support for 11 operating systems
- Thin Client and e-commerce applications using an HTML desktop



Applications

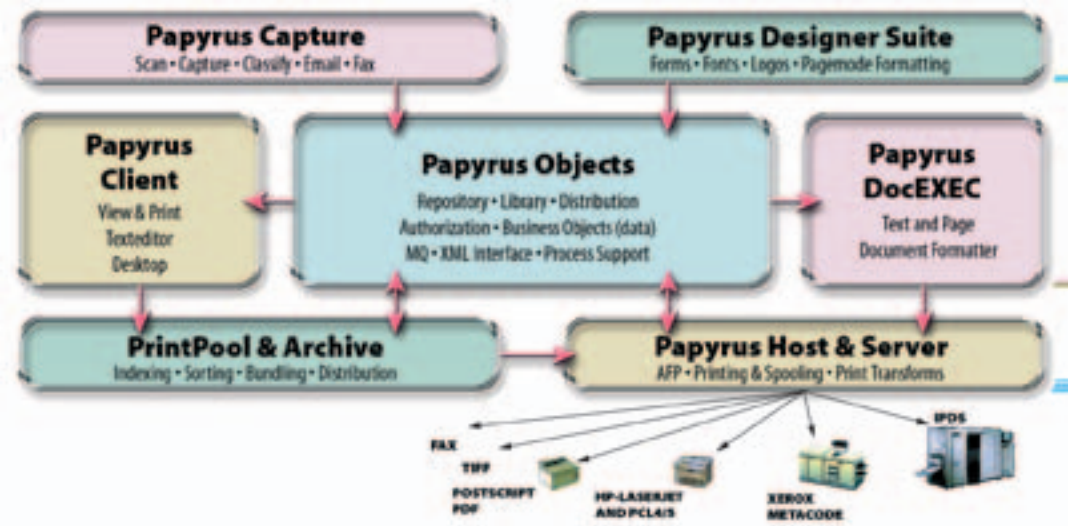
Papyrus Objects is successfully used to implement everything from distributed print management, correspondence/letter writing, archive and output management integration, email/fax and web access, bug reporting and tracking to order entry and sales applications with no additional external programming.

Since many organizations want to operate with fewer systems it makes great sense to standardize on a common platform for document management and process management rather than to deploy, integrate and maintain separate systems.

Papyrus Objects

The central infrastructure component of the Papyrus System offers an integrated solution that incorporates the capabilities of both document automation and administration. It is available from the mainframe to a plug-in appliance.

Some features of Papyrus Objects are normally available in transaction systems such as CICS, IMS or Tuxedo and environments such as CORBA or J2EE compliant Java Application Servers. The functionality of Papyrus Objects is available without programming special Java transaction objects.



From Document Automation to Document Integration®

Papyrus Objects uses powerful Peer-to-Peer capabilities for enhanced productivity

Peer-to-Peer enables users to skip a middleman - a server for example - and draw information directly from other devices on a given network. The potential for correspondence applications is that thousands of users, really anybody who is on a computer can share information, data, document resources or really anything with another peer in the intranet and internet. This makes Peer-to-Peer the next evolution of how to leverage the Internet. While the Web allowed the user to view a business document in the browser, Peer-to-Peer holds the promise of intelligently connecting all desktops with one another. The implemented hierarchy model in Papyrus prevents misuse of such a powerful open system.

For distributed correspondence applications Peer-to-Peer technology can deliver following key results:

- address data intensive application bottlenecks
- harness virtually any distributed resource unobtrusively and invisibly
- maintain the security of distributed document applications, code and data.

Peer-to-Peer distributed computing can provide a 10 to 100 times performance improvement for correspondence applications, for 10 to 20 percent of the cost of any alternative solution.

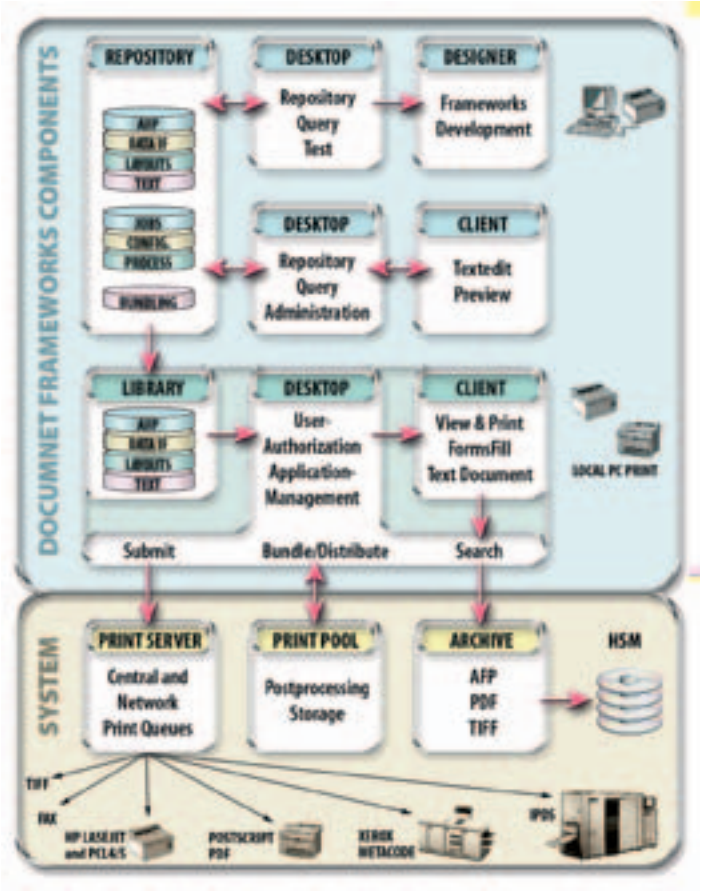
Papyrus Objects Benefits

Papyrus Objects provides a flexible environment for implementing and managing the

- process-to-application
- application-to-application
- application-to-document integration across the enterprise.

Integrated lifecycle management and platform independence reduce the long term system management effort substantially. Papyrus Objects Adapters and Type Managers significantly reduce the time, cost and effort associated with building and maintaining application interfaces.

- Improves customer service by simplifying business data access
- Provides timely and concise data for document generation
- Provides a homogenous look to the end user for different applications
- Integrates both personalized batch and ad hoc correspondence
- Opens the business data for e-commerce applications
- Creates integrated business processes with documents
- Delivers significant IT cost savings by enabling the business professional



The Developer Role

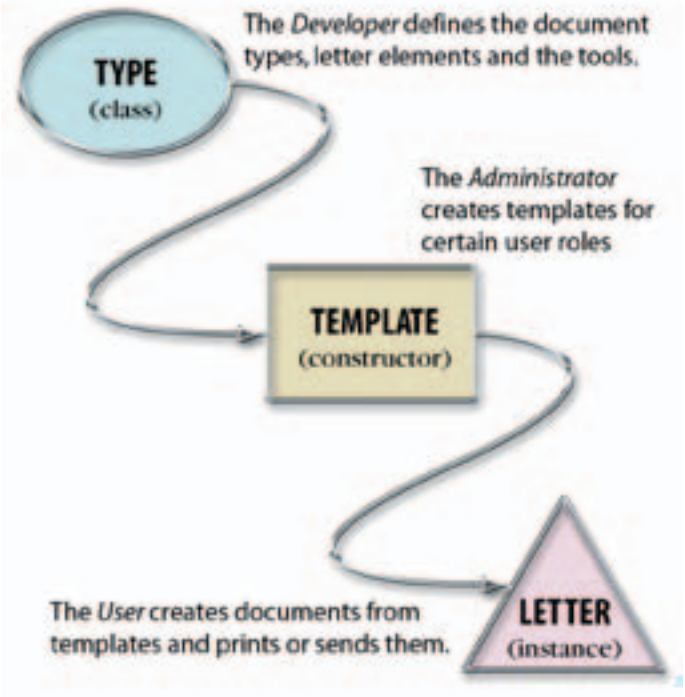
To define a new document application a user authorized as developer can create new document elements which are later formatted into the final document. The developer creates the document frame, class or type and defines how the business data is to be interfaced with.

To interface with business data either a Papyrus Type Manager for i.e. DB/2 or Oracle is used or Papyrus interfaces through standard Adapters to messaging systems such as MQ Series and business systems such as SAP, CICS, IMS and others. Adapters enable also easy integration with all legacy systems.

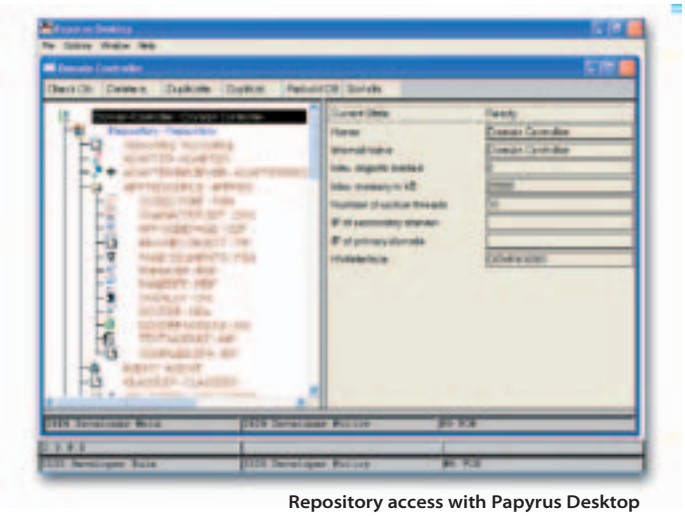
The developer has access to the Papyrus Repository to

- check-in resources
- maintain multiple environments (design, test, production)
- define version and variant control
- create new classes and library templates

Building a Document Framework



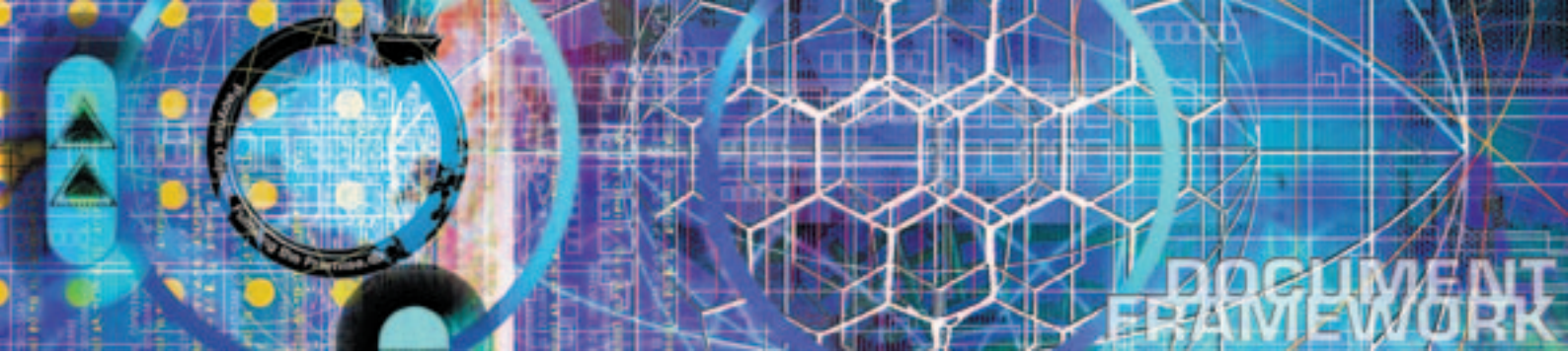
The ***Papyrus Repository*** stores documents and resources with versions and validation (from/to). This ensures that all content and letters are the most current and approved versions. Other features are the user role management, print job management and automatic software and resource distribution.

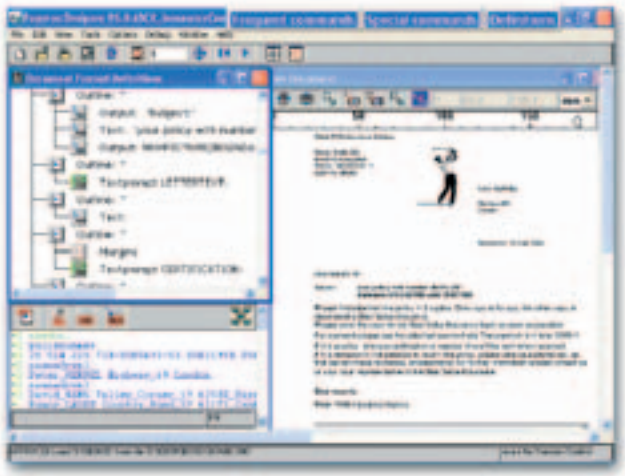


Repository access with Papyrus Desktop

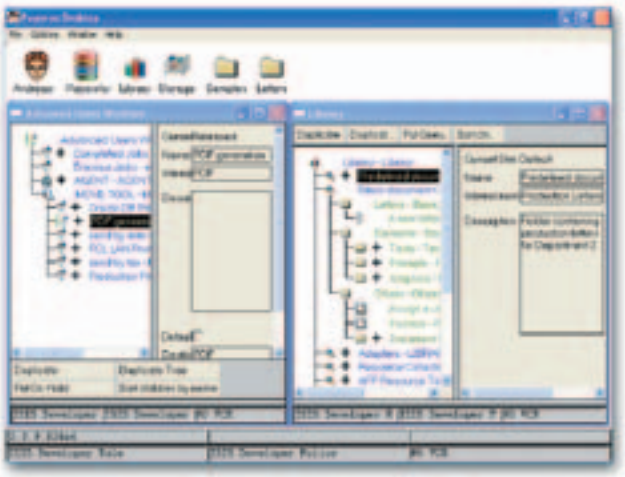
The quality and **corporate identity** can be dramatically improved by ensuring that correspondents work with the same document resources and text elements which are approved and stored in the common Repository. Built-in templates ensure a **consistent appearance** to all correspondence reinforcing the corporate and product branding.

Sharing the same document resources and templates for batch and ad hoc correspondence, reduces development time and cost and **ensures corporate identity**.





Papyrus Designer



Papyrus Desktop

For document design and data definition the developer utilizes the graphical Papyrus Designer.
Papyrus Designer displays for the design process the DATA interface, the LOGIC, the LAYOUT and the PRINTER RESOURCES such as fonts, forms and logos, each on its fully formatted page. The development is greatly simplified by the integrated graphical user interface that supports cross referencing between data, logic and layout.

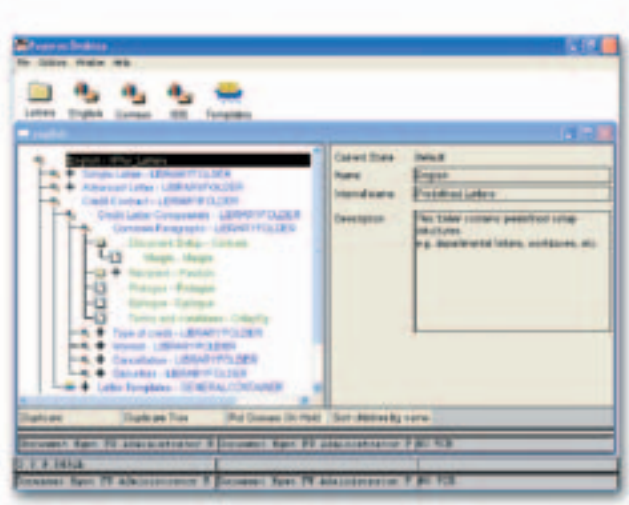
The functionality of the Papyrus Desktop:
The Papyrus Desktop has no hardcoded functionality for any special application. The user can communicate with all the objects which he has a direct or indirect relationship. Thus, it is guaranteed that the user can only access objects for which he is authorized.

From the idea to production of the business document in just days ensures shortest time to market cycle.

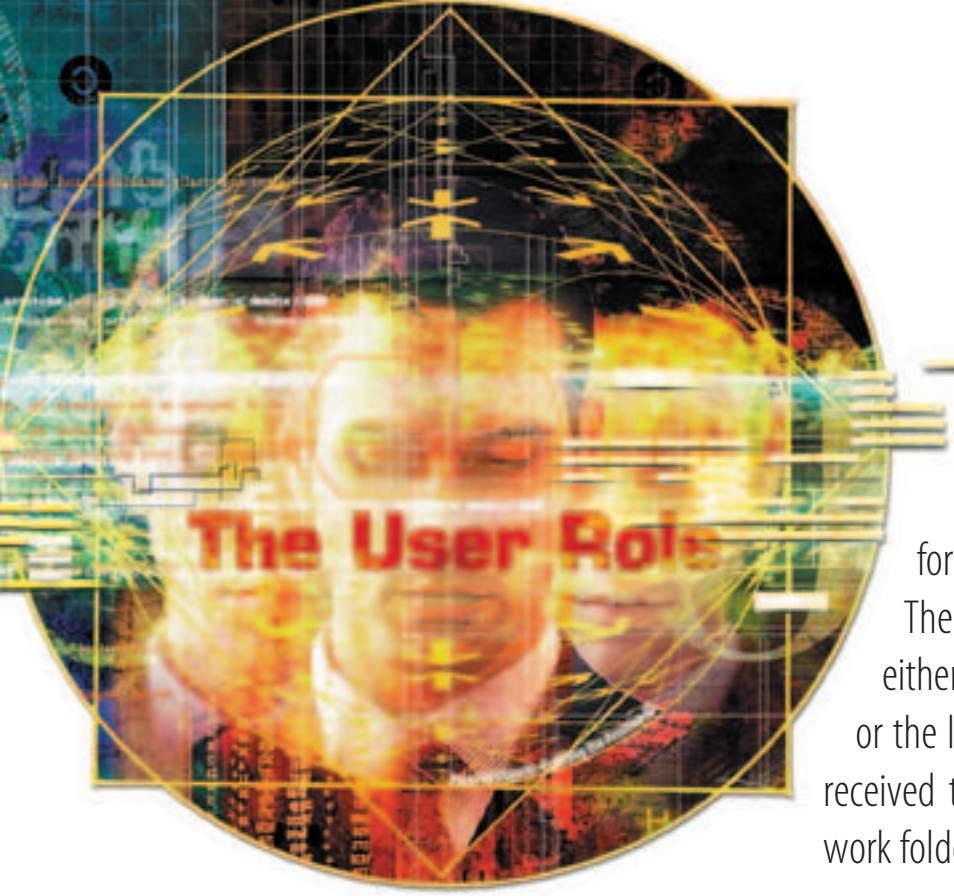
Business Analyst Role/Administrator

The administrator uses the Papyrus Desktop to access the Papyrus Library, assembling templates and adding criteria to the interface definitions. Version and Variant control enables the administrator to manage the lifecycle of the documents.

- The administrator uses the available definitions to create templates, customize them and store them to the Library. The template and library access is controlled by the authorization system.
- He/she assembles the objects of a framework to new business documents without using the Papyrus Designer. He/she works with the Papyrus Desktop by pulling elements from the library, assembling and changing the parameters to define a new letter. Using templates, one can have thousands of special variations built from one Class definition.
- He/she stores these letter elements to a library and assembles them to a set of letters. These letters can then be assigned to library folders. Obviously, reuse of letter elements is very simply supported by multiple references.
- He/she customizes and defines how objects are presented on the Desktop and worked with by the users. This avoids extensive dialog programming like with Java.
- He/she also assigns user authority and the access of the new business document in the library/application/menu hierarchy.



Library access by the Administrator



The User Role

The Papyrus Desktop features a simple user interface that requires no formal training and is very easy to use.

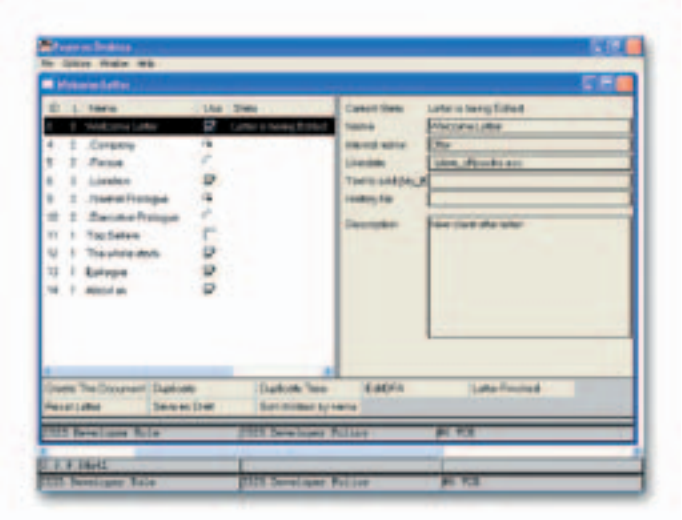
The Desktop application provides users access either to a number of libraries to select letters, or the letter can be created by a message event received through an ADAPTER and is kept in the work folder of the user.

Any User Can Generate Highly Customized Letters

Dynamic document assembly executes the correct text elements, graphics and other document resources defined and fills the letter with the variable customer information. The user can be prompted to customize authorized text and data fields. He has access to a simple text editor that offers typing text freely, using a spell checking utility, underline, cut, copy and paste, selecting a certain font, etc. Depending on their authorization and on the definition of the letter application, only some parts or all of the letter can be edited.

The Document Process

- A request (i.e. MQ Series) automatically selects a letter or the user selects a letter from a library.
- The user is guided through selection and modification of the letter.
- The letter text is edited where authorized.
- Previewing the letter by the user.
- Approving or rejecting the letter by the approver.



Papyrus Desktop with check box letter application:

The user can select or deselect letter elements and distribution options. The letter was defined by the administrator to be assembled from a number of elements of different types. By using the parameters in the template the administrator has defined which changes the user is allowed to make. Rules as to which elements are exclusive are checked. Data fields, used as letter variables, have range definitions so that the user cannot type in wrong data. Other rules verify that the letter can only be produced when certain conditions apply.

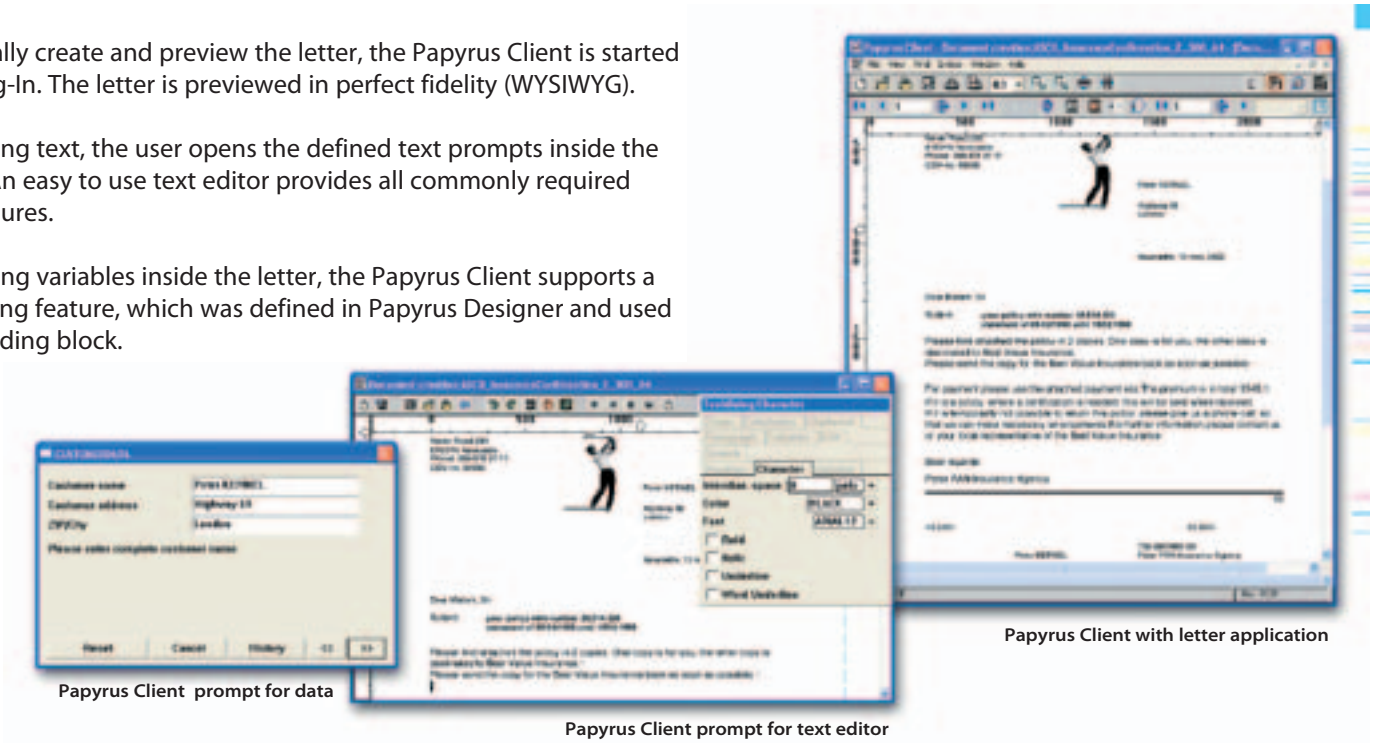
The customer service staff or any user can generate highly customized, high volume and ad hoc letters in a minimum amount of time.

Letter Preview and Edit

To actually create and preview the letter, the Papyrus Client is started as a Plug-In. The letter is previewed in perfect fidelity (WYSIWYG).

For editing text, the user opens the defined text prompts inside the letter. An easy to use text editor provides all commonly required text features.

For editing variables inside the letter, the Papyrus Client supports a prompting feature, which was defined in Papyrus Designer and used as a building block.



Papyrus Client prompt for data

Papyrus Client prompt for text editor

Papyrus Client with letter application

The 4 EYE Principle:

The user only sees the option 'Sign Off' and makes the document available for verification to a supervisor. The supervisor can, according to this role and document state, perform further editing or finally release the document. The document state can be sent to the application that requested the document.

The User Management

Papyrus Objects uses an integrated authorization system, to ensure that no user or program can access the system without the proper authorization. Authorized users have full management control of all phases of correspondence production, from document assembly to content approval.

Defining a Corporate Organization Hierarchy

All departments and their employees with their various roles are to be known to the system. Once the organization is defined, the applications to be implemented with Papyrus Objects need to be defined. These are organized in libraries, which group all objects and documents related to one user role together.

The Role and its Defined Privileges

Each user receives at least one role which can also have a privilege defined. The privilege string is defined in the method definition of the object. The Policy defines which instances a user is allowed to access.

Example:
The user may be allowed to perform the method 'delete' for one particular letter but he is only allowed to access the letter of a certain department or one specific application type.

Authorization and Security

User Roles and Policy define what the user sees on the Papyrus Desktop GUI having a certain role. Security is provided by data and communication encryption.

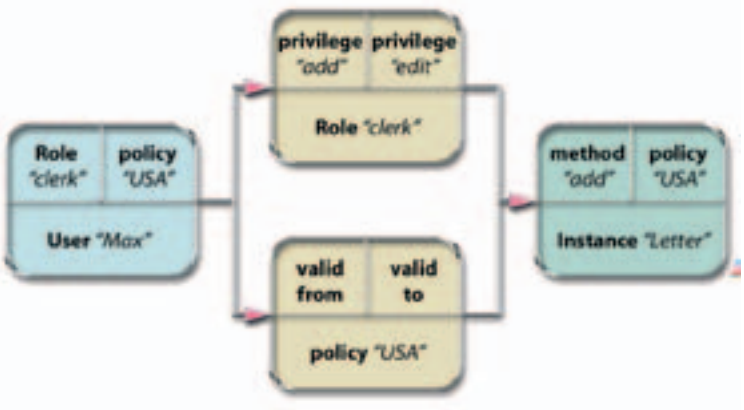
Interfacing with RACF, LDAP and ACTIVE D:

Logging onto the Papyrus Desktop executes the given ID and password from the customer's existing security system. Papyrus can interface with the company security system on the mainframe (i.e. RACF) and provides Adapter i.e. for LDAP. Papyrus Objects can also maintain security information by itself in its own storage.

The letter process uses state definition

A typical state sequence is:

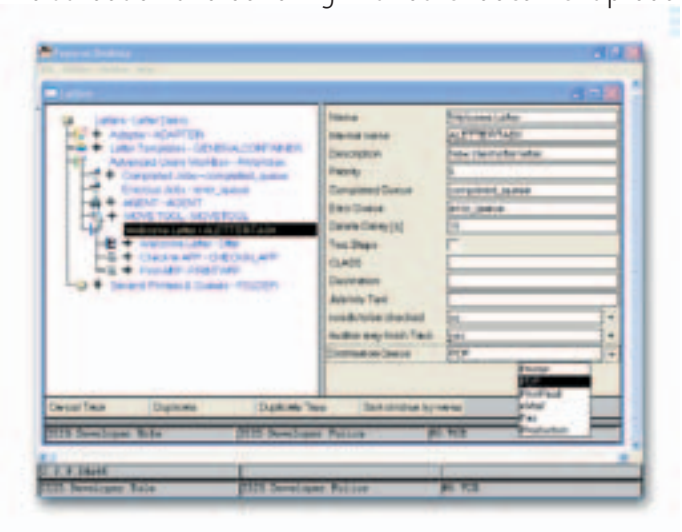
1 Request: Enables method 'edit'
2 Editing in progress: Enables method 'send' or 'sign off'
3a Send: Enables print
3b Sign Off: Enables send
4 Status printed: Enables method 'archive'
5 Archived: No further change allowed: Enables method 'view'



The message handler always checks if an object is allowed to access the system.

Choices of distribution methods:

After the document is edited and signed off it can be immediately sent per e-mail or fax, printed to any network attached laser printer and archived. Furthermore it can be sent to a centralized PrintPool for batch distribution and bundling with other document produced in batch.



Multiple targets can be defined, such as central distribution, local print, fax, email, archive and others.

Inbox and Outbox Folders

They represent transfer queues where letters or other business documents are temporarily stored. Such folders can also be assigned to a role and are therefore shared by all users of the same role.

The Work Folder

is a local but temporary folder where incomplete documents are kept.

The Archive Folder

enables the user to access the remote archive and perform searches. Copies of the archived documents can be viewed and kept locally. Much of the typical searching of archives is not needed since all documents, which have 'relationships' to the business are known and can be accessed directly. As such a document can only be processed when it is defined in this relationship, invalid archiving of documents is impossible.

Users can directly archive their letters in AFP format, PDF or TIFF. Furthermore the letters can be kept for a certain period in the Papyrus WebArchive for customer care purposes and Internet distribution. Papyrus WebArchive interfaces to third party long term archiving systems providing the required document format and an XML interface for the document index information.

The PrintPool Folder

Documents can be stored in the PrintPool for processing and they can be accessed by the user. In all cases this is controlled by the authority on the defined role.

Integration of ad hoc correspondence into batch operations

For batch distribution, all letters throughout the corporation are collected in a central PrintPool on a server or mainframe platform. Also, centrally produced batch documents from different business applications can be stored in the PrintPool for later bundling with ad hoc letters from users. All ad hoc letters and batch documents contain a document index information for later output management to multiple channels. OMR and Barcodes are added for automated print and mail printing can be directly accomplished at any high speed laser printer: IPDS, PCL, PS, Metacode. The email distribution option sends the correspondence as a PDF attachment to an e-mail message. The fax option directs the letter to a specified fax server.

Multi Channel Output

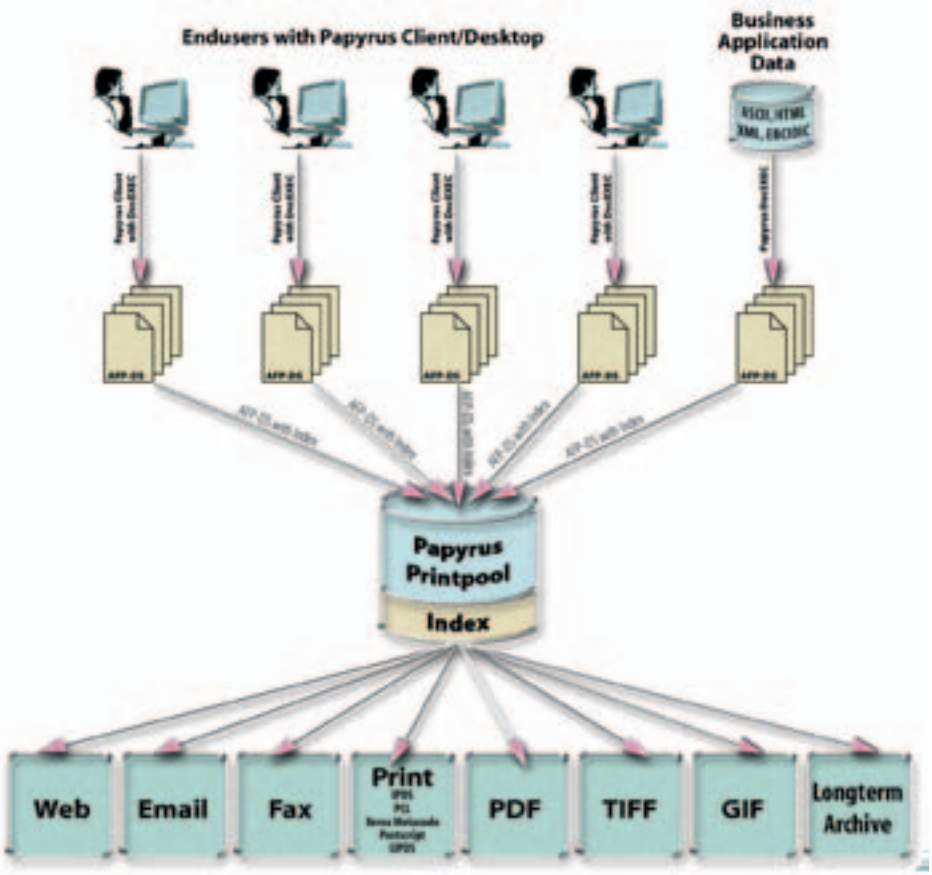
Papyrus uses a "Middleware" concept to protect the tremendous application development investment from the changes of hardware and software platforms. All documents are printer and system independent. There is no other effort required to use the same document definition on another platform than to copy the library.

Letter collection in a central Pool

The savings are noteworthy in an organization that generates a large number of letters. They can be printed on low cost high speed laser printers, bundled and enveloped by making use of the best postal discount.

At a glance:
Substantial cost reduction by:

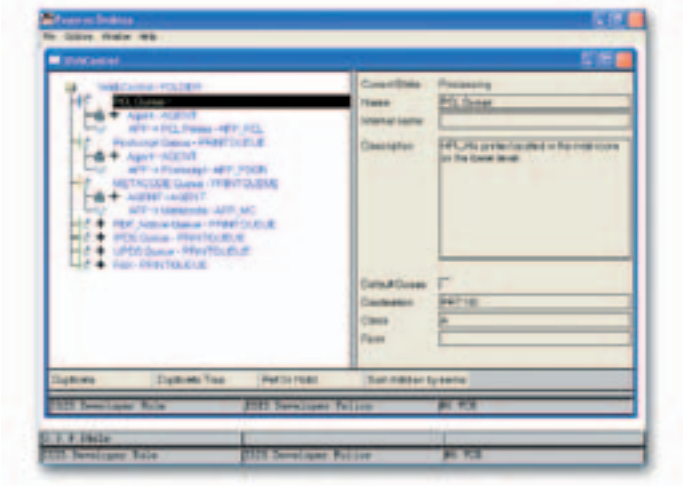
- merging host and PC documents into one envelope
- utilizing high speed printers for PC documents
- optimizing the postage per mail piece
- utilizing available discount structures
- printing less by viewing before printing
- reducing the amounts of printouts
- reducing the number of envelopes mailed



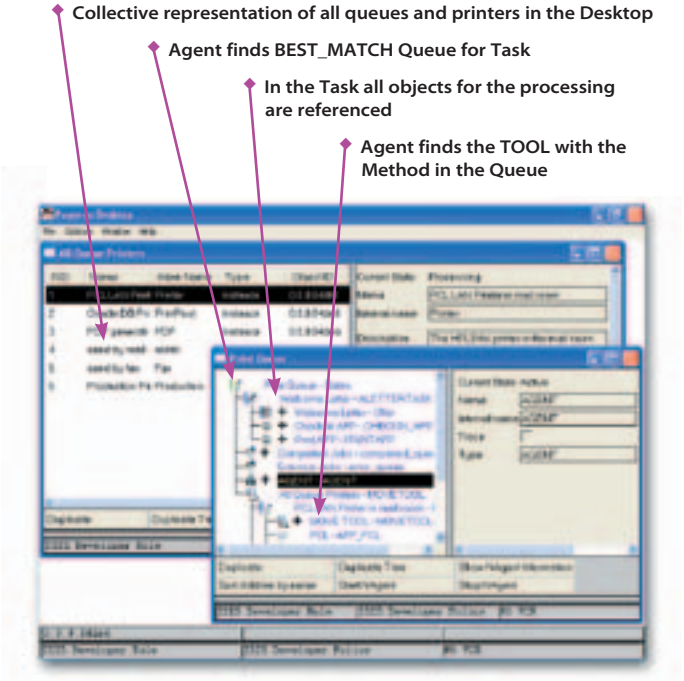
The Print Server Folders

If the user has the right role authority he can also perform the print and job management, spool and queue management.

The total integration is possible because the print server is also handled by a node of Papyrus Objects. The local representation of the print server is by proxy. If the user has a library where templates are available he can also create new print jobs and assign them to the print server queues. Automatic scheduling is also performed. The print resources are managed through file objects. The print server simply accesses them on the central library server and keeps local replicas on his local library. Version control is available.



Graphic: Print Server Management with the Papyrus Desktop.

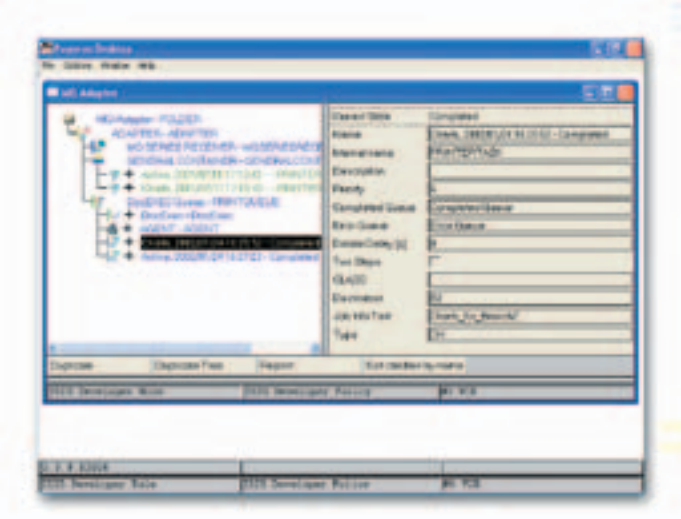


Papyrus WebControl

Papyrus Adapters are handling applications that span multiple systems and require the passing of documents and data between these systems.

Interacting with outside systems via API's that trigger actions in different systems requires typically a significant amount of custom programming and there is no assurance that the correspondence system can continue to monitor the process once control is passed to a third party application or system.

Papyrus simplifies this integration and reduces drastically the time and effort required through the use of enterprise application servers and providing ***Adapters*** for different third party systems such as major ERP systems i.e. SAP messaging systems such as MQ Series, interface with e-mail, workflow and legacy systems. The Adapter is used to convert messages and events into activities inside the Papyrus Objects system.



Papyrus MQ Series Adapter

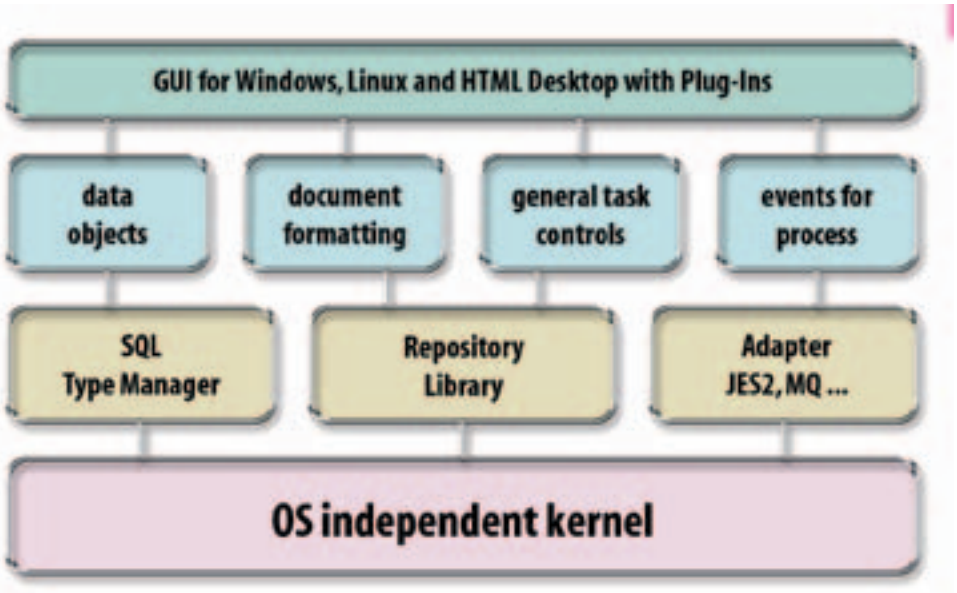
For example MQ Series Interface:

In many applications, it is required to call the letter generation from the host application. The adapter is a message translator, that waits for events to take place. When such an event occurs the RECEIVER will use its MATCH definitions to find a TEMPLATE in its library which is instantiated and filled according to the TYPE PROPERTIES.

In this flexible manner, there is no programming, compiling adapter programs or the need to distribute them, involved in defining how an adapter reacts to a certain event. Obviously version control can be used to manage the adapter and template setup.

The picture displays the MQ Series Adapter with its references to the message library and a TASK, which is instantiated through a message. The message mapping and data mapping from the MQ message does not require programming but is simply defined in the MQ Receiver and the templates in the folder.

The GUI window is only used by the Administrator or developer and never seen by the user who receives the messages. The TASK just appears in his work folder.



A typical application defines the data base structure, the queries, the processing transactions, and the user dialogs. All of these require the disassembly of the business case and process into technical elements.

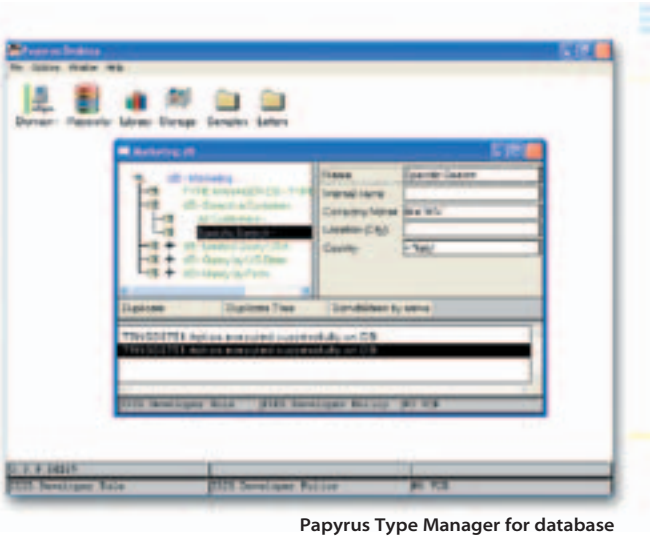
Papyrus Type Managers provide simple user and application access to any supported database without coding SQL and the need for acquiring or installing database clients on each PC.

The ***Type Manager*** is instantiated by the developer on a database server. A simple IMPORT command will extract the table definitions and create CLASS definitions in the Papyrus Repository. With these definitions, the developer or administrator can now define business object TEMPLATES. One row of the DV would typically represent one object instance. In these definitions, the fields of the tables are mapped to the defined business object. Queries produce a list object, which is a table extract of the database. In this query template the user can now edit the search or key criteria. This is much simpler to use than SQL.

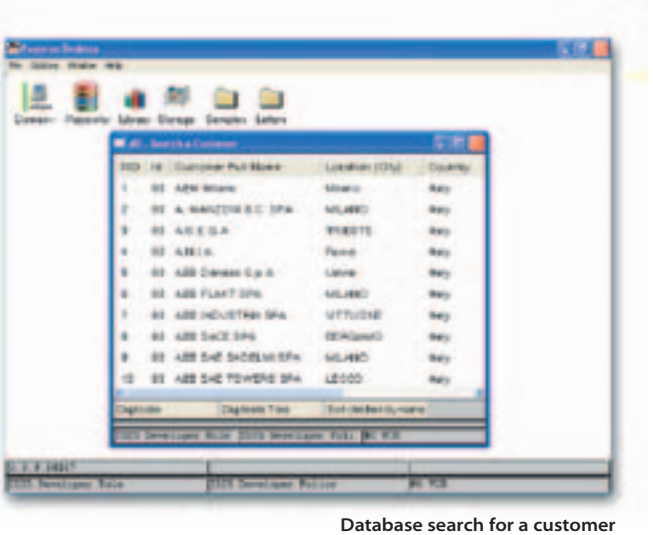
Once the data is entered the user can drag the query to the type manager and drop it. This will execute the search in the database. Alternatively the user can also click on 'GET DATA' in the query template.

In the above view, the message window is opened so that the Oracle DB messages can be seen. In case the query returns more than one row, a QUERY LIST is created containing the hit list.

The query list object can be used immediately in any Papyrus application as an input data object. This object can also be used in any other application. It can also be saved as an ASCII delimited or XML tagged file.



Papyrus Type Manager for database



Database search for a customer

Interfacing with Legacy Systems

Papyrus Objects uniquely simplifies this. The developer can now define business objects. He uses an Adapter or Typemanager supplied by ISIS to define how data from any existing database is mapped into documents and letters. Obviously, the business object also has operations that it can perform. This is mapping to the transactions, that might exist. In case of a new document application, it will use the template and its attributes, states and constraints to define the business process.
This object becomes usable by any other application not just in a document.

It can be used to query this business object at any time. Now the developer can define business objects such as customer, address, warehouse, account, item, claim settlement and so on. The authorized user can access any of these objects on his desktop. The defined reference class attributes declare which other objects can be referenced by a class. This means that one can not list a telephone call item to a savings account statement or link a car insurance claim to a warehouse.

frequently asked questions

Question **How can Papyrus** obtain data from various DB2 and IMS environments? Can the data read from the database be further edited by the user?

Answer **Yes. With Papyrus Objects** data entity objects are defined, and linked through a messaging interface such as MQ-Series, or a Type Manager interface to the database. A messaging adapter converts messages to objects, while a Type Manager creates proxies for external data instances. The administrator can drop the data and the building block templates in a new letter template on the Desktop. The data variable editing rights are defined by the administrator.

Question **Can the document** be customized by the end user, while paragraph access can be controlled by an administrator? Can the customized paragraphs be stored individually?

Answer **Yes. The user** can usually just customize an INSTANCE of a letter and this can be stored. The user can define his own TEXT templates and store them to his own LIBRARY folder. The user has NO ACCESS to the Repository, which only contains CLASS definitions, provided by the developer.

Question **Can comments** be stored for each customized paragraph?

Answer **Yes. Any number** of comment or detail fields can be defined by the developer.

Question **Is it possible** that next time the same document is regenerated for the same customer, the customized versions of the wording come in, and not the standard wordings?

Answer **Yes, in principle.** The proper procedure is not to regenerate the letter, but to retrieve the letter original from archive or storage. Regeneration is possible also, but then the original letter generation task has to be stored as well, which is possible if necessary. This way it is not necessary to also retain the information, which paragraphs (or document elements) have had customizations done, who they were done by, and who they were done for.

Question **Is it possible** for document elements to become automatically active on a certain date/time, or automatically expire on a certain date/time.

Answer **Yes. This is** provided by the Papyrus Objects version control.

Question **Can document elements** be reused as much as possible, by sharing document definitions and text elements across multiple document applications?

Answer **Yes. With Papyrus** the document definition code exists only once and is managed through the CLASS. The actual text or customization parameters are stored as attributes in a template. The templates can be referenced in multiple documents

Question **How is security** implemented? Is it possible to use RACF or ACF2 information with different levels of security, administrators, document designers, end users, etc?

Answer **Yes. There are** several areas. SECURITY is achieved by encryption of objects and communication, ACCESS CONTROL, which is achieved by user id/password and AUTHORIZATION, which is done by role and policy definitions. Papyrus Objects can interface to RACF/ACF2 to read their definitions through a Type Manager.

Question **Can this security** be used to control who is allowed to access certain instances of documents across different departments?

Answer **Yes. Role and policy** definitions control document access for library and archive.

Question **Can Papyrus Objects** be used to manage text elements also for mainframe batch production runs including the use of version control?

Answer **Yes. Papyrus DocEXEC V6** can read the Repository and Library in batch also.

Question **Is there a workflow** component in Papyrus that can move a document through it's life cycle, monitor the status of a document and provide reporting on where documents are?

Answer **Yes. There is** a development state, which controls the life cycle for development of CLASS and TEMPLATES. The state processing of the instances is freely definable, which controls the data collection, letter generation, four-eye-signoff, and the output process. The access to the documents is based on the state and authorization and thus provides a workflow scenario for development and production processes.

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