MANAGE
AUTOMATE
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Leading the
Integration
Revolution

Your business problems have changed.
Why hasn't your integration solution?

Proposed
Solution Design

gebs
software solutions

PREPARED FOR

GEBS Reporting

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Contact : contact@gebsreporting.com

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Overview

The **Solution Design Document** is a high-level design report that describes how you may implement a technical solution for your project.

This design is customized to the specific integration and business process management related project that you are working on.

This document has been developed by senior solution architects at GEBS Reporting who are experienced in implementing business integration

projects using GEBS Reporting's Enterprise Business Integration Management Server (GRBIMS) at many companies in different industry verticals.

This document reviews the business and technical requirements for your project, as provided by you, proposes key project phases and shows how you may implement your business process integration project using the GEBS Reporting GRBIMS.

Benefits

This document will help you with understanding how to approach a business integration problem, what your solution may look like and a roadmap that leads to the complete and successful implementation of your project.

If you are just getting started with your project, this document will be a very useful guide in shaping the eventual solution for your project.

It will help you understand how to gather the requirements, which questions to ask and what issues to focus on.

If your business integration project is already underway, this document provides a valuable comparison with the approach, design and solution that you are currently pursuing. It will offer ideas on alternative approaches that may accelerate your project or validate the solution design that has been developed.

This document will not solve your IT problem or implement a complete solution to your project but it will provide a high-level solution design and suggest an approach on how to implement the solution. It will not get you to your destination but, we hope, it will put you on the path that takes you successfully to the destination.

REQUIREMENTS ANALYSIS

This section discusses briefly the business drivers and especially the technical requirements specific to this project or initiative. This is based on information provided in the "Solution Design Request Form" filled out at the GEBS Reporting website and any additional information provided separately via email or phone discussions. [www.gebsreporting.com]

Business Requirements

• Business benefit of project: Reduce operational costs by eliminating manual steps and provide better customer service.

• Project status: Project has been approved by management and budget allocated. Project will start next month.
• Project timeline: Information not provided
• Business process addressed by project: Order tracking
• Type of integration: Email to back-end application integration
• Project solution: Incoming email will be automatically processed such that the order entry data from the email attachments is intelligently analyzed and entered into appropriate backend application databases
• Separate steps of the process flow: Information not provided
• List departments and function areas that will interact with this business process: None, there are no human workflow tasks

Technical Requirements

Purchase orders will be received by email where the order data is in the Excel attachments. The Subject of the email specifies the Excel spreadsheet format. Each row of the spreadsheet will be used to insert into, or update, one of two databases. If a row in the spreadsheet causes an error (e.g. duplicate record), the content of that row from the spreadsheet will be written to a sequential file.

Human Workflow

As this process is fully automated, there will be no workflow tasks that require business users to interact with this flow.

Sources Formats and Protocols

The source is email and so the POP3 protocol will be used. The attachments will be Excel sheetsand the format will be differentiated by the Subject line. Two types of emails can be received and their subject lines will be "FORMAT 1" or "FORMAT 2". Their formats are not yet finalized.

Target Formats and Protocols

The targets are two separate Microsoft SQL Server databases, DB1 and DB2. Only "inserts" are entered into DB1 and "updates" into DB2.
The format for both databases is same and will be specified later.
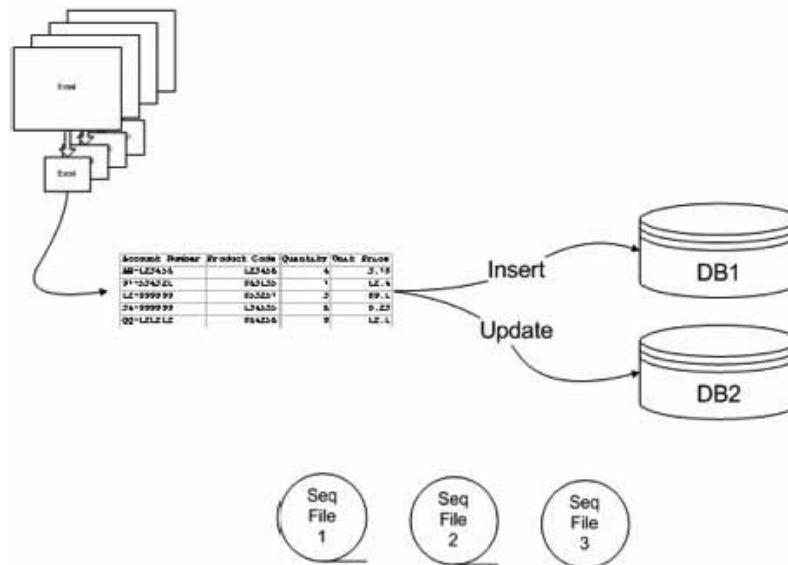
Business Rules

All the business and data mapping rules have not been identified at this time. There will be a field"account number" in both the source Excel formats and in the target databases.

For EACH row in the spreadsheet:

• The account number must be of the form "99-999999" or "AA-999999" (where "9" represents any numeric character, "A" represents any alphabetic character and "-" is a minus sign). If the account number is not of either form, that ONE row must be written to sequential file "Seq File 1".
• If the account number is of the form "99-999999", then that ONE row must be treated as an insert into DB1. If the insert fails for any reason, that ONE row must be written to sequential file "Seq File 2".
• If the account number is of the form "AA-999999", then that ONE row must be treated as an update into DB2. If the update fails for any reason, that ONE row must be written to sequential file "Seq File 3". Every email must be processed only once.

Scalability

Multiple emails could be received simultaneously and they must be handled in real-time.
The source data file sizes will be small and will not exceed 10KB.
Number of peak simultaneous transactions: Up to 20 emails at any time.
Number of daily transactions: Information not provided.

DESIGN APPROACH

This section reviews the high-level design of the solution for this project. It is desired that the fundamental goals of a good design be offered in this solution, they are:
- Solution must meet or exceed business objectives
- Solution must offer the technical features and functionality needed
- Complete project on time or earlier
- Complete project on budget
- Solution must be flexible so it is easy to manage changing business rules
- Maximize chances of success of the project and minimize risk of failure

This solution as described here will be implemented and deployed on the GEBS GRBIMS product. GEBS Reporting GRBIMS will act as a central server where the solution process flow resides and is executed at run-time.

High-level Design

The picture below shows that the GEBS Reporting GRBIMS will be located as a central hub which "orchestrates" the action of different automated activities and human workflow tasks and so manages the flow and processing of data. It uses the GEBS Reporting subcomponent to root the requests.
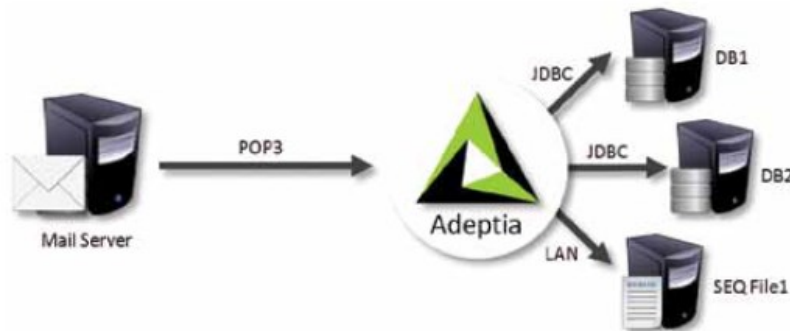
The solution process flow at the GEBS Reporting, when triggered will:
- Automatically login to the mailbox via POP3 protocol and look for emails with the specified Subject fields
- When the appropriate email message is found, it will be downloaded to the GEBS Reporting GRBIMS and the Excel attachment extracted.
- The message is marked as read at the mailbox to ensure it is processed only once.
- The Excel attachment will be parsed and each record (row) will be processed as per the specified rules
- Each record from the source Excel file will be sent either to database DB1, database DB2 or the error records will be sent to flat files.

Users

There are two types of users that can be categorized on the GEBS Reporting GRBIMS. They are Developers and Business Users.

- **Developers:** These are IT engineers who design and implement process flows. For this project, as many Developer accounts can be created as needed depending on the size of the project team.
- **Business Users:** These are end-users who interact with process flows thru workflow tasks. For this project, no Business User accounts are needed since there does not seem to be a need for human workflow activities.
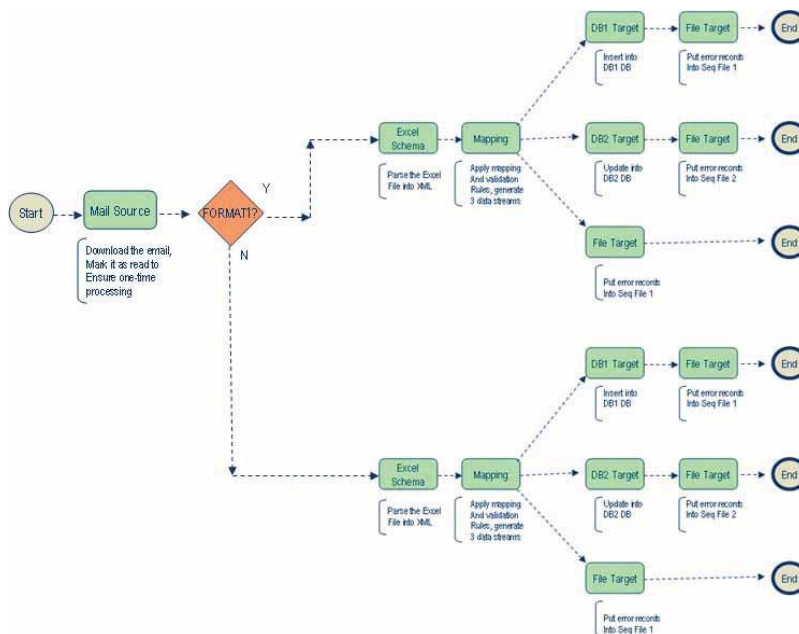
Process Flows

At this time, based on the requirements understood so far, only one process flow is needed. This is described from a high-level above and in detail below.

Triggers

A real-time trigger will be used to start the execution of the flow. This will be the EMAIL Trigger.
GEBS Reporting EBIMS will poll the mailbox to check if any email messages with the specified Subject field have arrived. As soon as the first message is detected, the process flow execution is started.


The first step is the "Mail Source" service that downloads the email message. The Subject field of the downloaded email is passed to the context of the process flow so it can be checked in the "Decision Node" to see whether the Subject is Format1 or not? Based on the check of the Subject field, the Decision Node determines which part of the process flow is executed. The top part of the flow is for message "FORMAT 1" while the lower part of the process flow is for message "FORMAT2".
The next activity for both parts is the "Excel Schema" and this is where the Excel attachment is parsed. After the Excel file is parsed it is sent to the "Mapping" activity where the record level business and mapping rules are applied. The output of the "Mapping" activity is three separate data streams, one each for DB1, DB2 and error records (Seq File 1).

Control Flow View

The figure below shows the "control flow view" of the solution process flow and it specifies the sequence of execution of all the activities in the flow. This can be different from the data flow view because data streams can go from one activity to any activity that may be later in the flow and not necessarily to the next activity in the sequence of execution. Sometimes this can result in the data flow view showing that there is parallel processing of data, however, the control view will accurately show that the execution is sequential and not parallel.
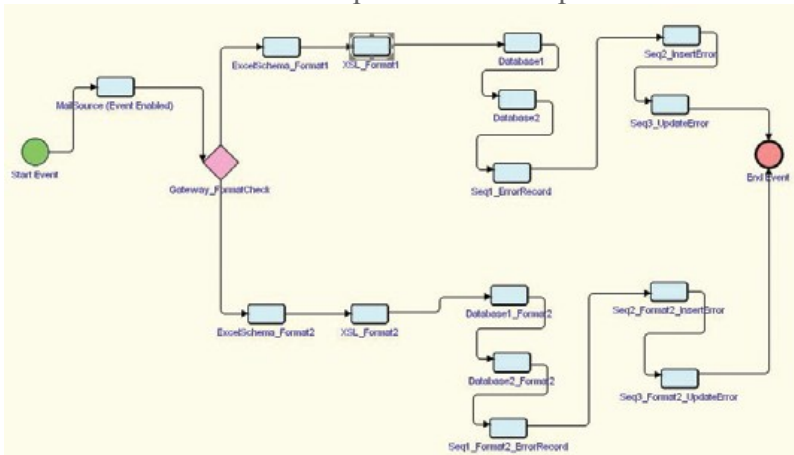
The above figure is a screen-shot of the actual view of this process flow in the GEBS EBIMS. It shows that all the activities in the flow are executed in sequence after the decision node determines which path in the flow to take (either the upper path for FORMAT1 or lower path for FORMAT2).

Description of Activities

The process flow as described above will be composed of the following set of activities:
- **Mail Source:** This "transport" activity logs into the mailbox and downloads the message with the specified Subject field (in this case "FORMAT*"). It marks the message as read or it can also delete the message. The output of this activity is a data stream of the Excel attachment.
- **Decision Node:** This is a "gateway" object that performs a conditional check. The value of the Subject field of the downloaded message is passed to this gateway to check for FORMAT1.
- **Excel Schema:** This "schema" activity parses the Excel attachment and outputs an XML data stream. Two Excel Schema activities are needed for the two separate formats of Excel attachments.
- **Mapping:** This activity applies the business and mapping rules on the XML stream that is the source Excel data. It processes the incoming data and outputs three different data streams, one for insert into database DB1, another for update into database DB2 and an error record stream going to a flat file. Two Mapping activities are needed for the two separate formats of Excel attachments.
- **DB1 Target:** This activity takes the first output stream from Mapping activity and "inserts" it into database DB1.
Any records that were not loaded into DB1 are sent to a flat file.

- **DB2 Target:** This activity takes the second output stream from Mapping activity and "updates" it into database DB2.

Any records that were not loaded into DB1 are sent to a flat file.
- **File Target:** This activity is used for saving the error records streams into the flat files for later processing and recovery.

PROJECT PHASES

GEBS Reporting recommends the following project phases based on typical best practices for process automation and process-based integration projects.

Phase 1: Requirements Definition

- Workflow - Identify all Business Users: NA for this project
- Workflow - Identify all workflow tasks and rules for them: NA for this project
- Source transport protocol rules: Email source
- Source format and record fields: Excel schema
- Target transport protocol rules: Database target
- Target format and record rules: Database schema
- Mapping rules: FORMAT1 to DB1 and DB2 field level mapping
- Mapping rules: FORMAT2 to DB1 and DB2 field level mapping
- Mapping rules: Error and exception records
- Identify Exception scenarios and specify handling rules
- Triggers - Identify rules and conditions for executing flow: Email Trigger

Phase 2: Solution Design

- Design high-level process flows
- Design detailed process flows
- Design all the workflow tasks and automated activities
- Design deployment environment and hardware setup

Phase 3: Implementation

- Develop Workflow tasks: NA
- Develop Source Transport activities: Source Email
- Develop Source Schema: Excel schemas for FORMAT1 and FORMAT2
- Develop Target Schema : Database DB1 and Database DB2
- Develop Target activities: Databases DB1 abd DB2
- Develop Mapping activities: FORMAT1 and FORMAT2 to DB1 and DB2
- Develop Process Flows
- Develop Trigger

Phase 4: Testing

- Create test scenarios and test plan

- Functional testing
- Testing of errors, exceptions and boundary conditions
- Scalability and performance testing
- Acceptance testing

Phase 5: Deployment and Hand-off

- Deploy in production environment
- Test deployment
- Train business users and administrators
- Hand-off and project completion
- Review project metrics and identify lessons learned.

EFFORT ESTIMATE

Here is a rough estimate on the effort needed and tentative timeline to implement this project.
The effort is estimated in :

Resources	Elapsed Time	Net Effort
Phase 1: Requirements Definition	13 weeks	3 weeks
Phase 2: Solution Design	21 week	2 weeks
Phase 3: Implementation	23 weeks	6 weeks
Phase 4: Testing	12 weeks	2 weeks
Phase 5: Deployment & Hand-off	11 week	1 week
Total	10 weeks	14 weeks

It is estimated that the Elapsed Time will be about 10 weeks and Net Effort will be about 14 person weeks. These estimates are based on GEBS Reporting's experience with numerous real world projects of a similar nature. As the business and technical requirements are clarified in detail
or if they change, these estimates could change significantly.

DEPLOYMENT SCENARIO

The solution for this project may be deployed as per the software and hardware configuration described below.

Development, Staging and Testing Environments

- Software setup:
• GEBS Reporting EBIMS Express Edition - Free license (needs annual renewal) or Perpetual license
• Relational Database: MS SQL Server or Oracle or DB2
- Hardware setup:
• CPU: Pentium 3 or higher, 1GH or higher
• RAM: 1GB or more

• OS: Windows 2000 or higher

Production Environment

- Software setup:
• GEBS Reporting EBIMS Professional Edition
• Relational Database: MS SQL Server or Oracle or DB2
- Hardware setup:
• CPU: Pentium 4 or higher, 1GH or higher
• RAM: 2GB or more
• OS: Windows 2000 or higher

INTRODUCING GEBS Reporting

GEBS Reporting's Enterprise Business Integration Management Server is an enterprise software
product that combines process management with application and partner integration. The EBIMS
Server easily and quickly automates business processes across supply chains using
industryspecific
standards. It allows customers to integrate disparate information sources, software applications
and business users both within an enterprise and across customers, vendors and business
partners. It also allows customers to design, automate and improve workflows and thereby drive
efficiencies.
GEBS Reporting EBIMS helps business users and IT staff to collaborate so as to automate and
optimize complex business processes. It offers a powerful business tool for managers to
document, control and monitor critical processes and then improve them. It also offers IT staff an
easy and simple way to deliver highly complex process management for changing business
needs. This enterpriseclass software allows companies to leverage the Internet by deploying
extended enterprise processes that link partners, suppliers and customers.

GEBS Reporting EBIMS Server

GEBS Reporting's Enterprise Business Integration Management Server is a comprehensive
solution that combines process management with application and partner integration. It allows
business users and IT staff to collaborate so as to automate and optimize complex business
processes.
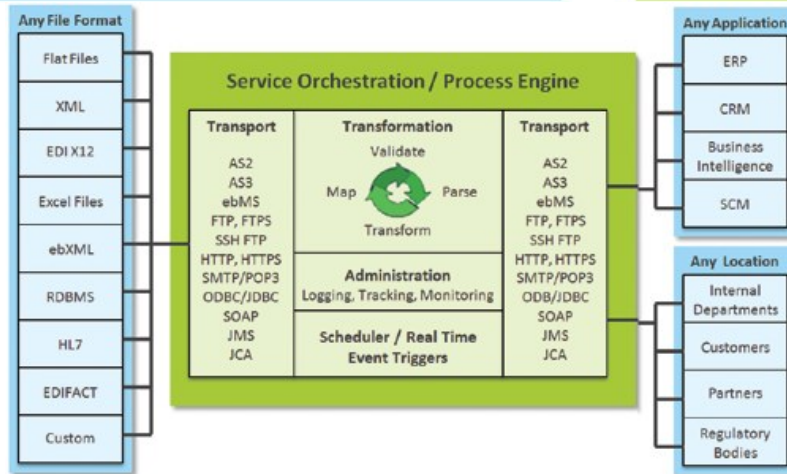
EBIMS offers a powerful business tool for managers to document, control and monitor critical processes and then improve them. It also offers IT staff an easy and simple way to deliver highly complex process management for changing business needs. This enterprise-class software allows companies to leverage the Internet by deploying extended enterprise processes that link partners, suppliers and customers.

Benefits

• Document and formalize business processes, tasks and rules
• Enforce business decisions by specifying them in processes
• Ensure processes are constant and repetitive, not ad-hoc
• Track tasks, monitor performance, and optimize performance
• Shorten process lifecycles and seamlessly manage exceptions
• Accelerate return on investment by realizing significant cost savings on integration projects
• Leverage technology investments by extending functionality of existing systems
• Generate new revenue opportunities by bringing products and services to market faster than competitors
• Enhance customer relationships by making it easier to do business with your organization

IT Benefits of EBIMS

• Reduce operational costs thru process improvement
• Implement new business solutions faster
• Improve alignment between IT activities and business
• Reduce errors and costs of fixing errors
• Reduce cost of change, simplify maintenance
• Solve business problems faster and cheaper

Key Features

• Business managers can document and model process flows and hand them-off to IT for automation

• Business users can utilize workflow capabilities to interact with processes, view business information and make decisions all via a web-browser
• Web-based, intuitive interface allows for increased productivity with minimal training
• Comprehensive web services capabilities
• Full-featured integration functionality for the enterprise includes message transport, data transformation and transaction scheduling
• Aggregate and distribute content to and from multiple source and destination systems
• Object-based architecture promotes reusable components and functionality across disparate custom, packaged and legacy applications
• Complete management, reporting and auditing capabilities to track and monitor transactions
• Fully standards-based solution, using XML and J2EE

Why Not Custom-Code?

Custom-coded Interfaces
• Point-to-Point model
– Integration is a N-to-N problem
• Takes longer to develop and test
• Limited reusability
• No ability for business users to interact with processes
• Limited capability to handle exceptions and errors
• Business and data mapping rules are embedded in the code
• Changing the rules and formats are difficult to manage
• Works okay for handful of interfaces, does not scale
• Works for simple situations

Integration based on EBIMS
• Hub-and-Spoke model
– Integration is a N-to-N problem
• Faster to deploy due to high reusability
• Allows business users to interact and make decisions in processes
• Easily handles exceptions and errors
• Simplifies manageability with changing business and IT environment
• Scales up to many interfaces, apps and systems
• Works for both simple and complex solutions
• Enables real-time automation, promise of STP
• Better reporting, alerts and notifications
• Better control, visibility and management

SUMMARY

The design proposed in this document offers the most powerful and flexible solution that will not only meet the company's current project needs but also grow to address future requirements.

This solution will help your company:

- Unify business processes
- Automate workflows and reduce manual steps
- Provide ability to handle changing business rules
- Increase productivity
- Increase data integrity, reduce errors
- Enable timely reporting

NEXT STEPS

Please contact GEBS Reporting (sales@GEBS Reporting.com) to schedule a call for an interactive discussion and review of this document. GEBS Reporting will be happy to work with you to help you evaluate GEBS Reporting products to ensure they meet your needs. GEBS Reporting and its partners also offer consulting services and technical support to assist you with the design, development and deployment of the complete solution that meets your project requirements.