

# CIM Concepts Custom Application Development

## Case Study: Engineering Services Requests

An East Coast oil refinery had specific chain-of-command approval requirements for engineering support requests. Their piecemeal communication methods allowed too many items to “fall through the cracks.”

CIM Concepts created an intranet application that guides users through the engineering request process and routes requests automatically by email through the approval hierarchy.

### Challenges

- Different set of approvals needed for each operating unit.
- Manager assignments change over time. Alternate approver(s) needed when main approver is on vacation or out sick.
- Attachments and supporting documentation must be protected from removal or modification after the request is submitted.

### Critical Issue

- Frequent lost assignments, with no way to track what happened to the request.

### Solution

- New web application allows entry of new requests, review of pending requests, and searching of the request database.
- Requests are automatically routed through the approval process via email. Users are automatically notified of actions taken on requests.
- The application uses LDAP for directory lookups to automatically use the most current email addresses at all times.
- Attachments and supporting documents are stored securely within the database.
- New users are automatically added to the system upon submittal of their first request.
- All updates to configuration or personnel-related data are logged to an audit table.

### Result

- No more lost assignments!
- Ease-of-use. System automatically routes requests to the required approvers.
- Users can easily track where their request is in the approval process.

### Project Details:

CIM Concepts created an intranet web application using ASP (active server pages) and VB Script. The application is accessible from the existing engineering department web page. The Engineering Support Request data entry screen makes extensive use of select lists to help guide the user through the process. Users can save preliminary requests to edit later, or submit for review. The user can optionally attach supporting documentation (Word documents, Excel spreadsheets, or images, for example) to the request at the time of submittal.

A SQL Server database stores the engineering requests as well as data structures to model the approval hierarchy for each operating unit. When a request is first submitted, the first-level approver on the chain is automatically notified by email. With each approval granted, the originator and the next higher approver are notified. If a request is rejected, the originator and each approver that has already approved the request are notified. Higher-level managers can bypass lower-level managers to immediately grant final approval to critical requests; once again, all affected parties are notified. All email notifications contain a link to the application so the recipient has one-click access to view the affected engineering support request.

Attachments are stored securely in database image fields, eliminating any chance that they will be deleted or modified after the request is submitted. The application reads attachments from the database to allow viewing in native format.

Application access is integrated with the operating system, so there is no need for a second log-on. The application uses LDAP (Lightweight Directory Access Protocol) to look up the user names corresponding to the currently logged on user, and to dynamically determine the correct e-mail address for the user.


When a new user submits an engineering request, he is automatically added to the application's user list. The application locates and displays to the user items he has submitted, items awaiting his approval, and items that he can approve as a designated alternate for another manager. Users can also search for and display past requests by any of several criteria.

At any step along the way, an approver can add a comment as they approve or reject an item. Such comments are stored in the database along with the request and are seen by all subsequent viewers of the request, with the name and date the comment was added.

The application also includes a 'Committee' component. After items reach their final approval in the unit's hierarchy, they go to the committee for review and approval or rejection. The committee can add comments or request more information from the originator before deciding. The system sends these information request emails, which contain the text of the committee's question along with the link to the engineering request. Once the committee approves an item, the application tracks to whom it is assigned for execution, and allows reassignment to a different resource if necessary.

Since chain-of-command data is sensitive and important to application function, database triggers automatically record all changes (inserts, updates, or deletions) to critical data tables in an audit log. For each engineering support request, the database keeps a record of every action that is taken upon it, and every email notification that has been sent.

Sample application screens:



Welcome:  
Doe, John A

[View My Items](#)

[Add a New Request](#)

[Search](#)

## Request for Engineering Support

### My Items

*Items Originated by Me* 3 Items Found

Status	Request ID	Create Date	Subject	Unit
<a href="#">Rejected By Committee</a>	<a href="#">2005-004</a>	<a href="#">6/17/2005</a>	<a href="#">Approval Test</a>	<a href="#">Unit 60 Facilities</a>
<a href="#">Cancelled</a>	<a href="#">2005-003</a>	<a href="#">6/16/2005</a>	<a href="#">This Is A New One</a>	-
<a href="#">Submitted For Approval</a>	<a href="#">2005-001</a>	<a href="#">6/10/2005</a>	<a href="#">Test1</a>	<a href="#">Unit 21 Crude</a>

*Items Assigned To Me For Approval* 1 Items Found

Unit	Request ID	Subject
<a href="#">Unit 21 Crude</a>	<a href="#">2005-001</a>	<a href="#">Test1</a>

*Items I Can Approve as Manager's Designee* 0 Items Found

Unit	Request ID	Assigned Approver	Subject
No Items Found			

**Figure 1: RES "My Items" Screen**



**Request for Engineering Support**

**Database Search**

RES Number:

Originator Last Name:

Originator First Name:

Unit:

Create Date:  to

Status:

Ferret Item?:

Ferret Item No.:

Work Order No.:

Priority:

Funding Type:

**Figure 2: RES Search Screen**

Client Experience:

“It’s worked out fantastic for us,” says the Project Engineering Manager who commissioned the RES application. “Before, the system we had in place was to email documents manually. We were constantly losing assignments. People would call and say ‘Did you get my request?’ There was no way to know what happened to it. Did it die in someone’s in-bin? Who had it last? There was no feedback. It was total chaos.”

“Now, we can track requests from inception through committee approval to final assignment. We have not lost any requests under the new system.”

“[The CIM Concepts analyst] was great to work with. She came in to find out what we needed and just took the ball and ran with it. She has been real responsive to us for the minor changes or ‘tweaks’ that we’ve needed in the eight months we’ve been using the system.”

