CASE STUDY : EXIDE INDUSTRIES LIMITED

SOLUTION AREA : APPLICATION DEVELOPMENT IN J2EE PLATFORM

Client: Exide Industries Limited	**Country:** India
Industry: Battery Manufacturing	**Status:** Completed
Solution Area: Application Development	

Company Profile

Exide Industries Limited (EIL), India's flagship of the storage battery industry - is also the largest Power Storage Solutions Company in South and South East Asia. It manufactures the widest range of storage batteries in the world from 2.5Ah to 20,600Ah capacity, to cover the broadest spectrum of applications.

The Industrial applications of EIL batteries extend to Power, Telecom, Motive Power, Mining, Railways, Emergency Lighting and Non-Conventional Energy Sources. The Company is the largest manufacturer of cap lamp batteries in the world. It is also one of the five companies in the world which has the capability to make submarine batteries for both Russian and German types.

EIL is the first battery company in the country to introduce polypropylene case batteries and maintenance-free batteries. It is also the pioneer of several new technologies like flat-plate, and tubular plate batteries.

Project Brief

EIL proposed to develop an application that would help the company to maintain a Customer / Vendor information database that requires to be managed centrally through a web administrative interface.

EIL's existing system has the functionalities of **Online Test** for new joinees and a module for **Traction battery size calculation**.

EIL's proposed System is to develop a **Web based Customer Management Portal**, where in it would help the company to maintain a Customer / Vendor information database to be managed centrally through a web administrative interface.

The entire requirement is classified into the following sections.

1. **Static**
2. **Dynamic**

The following features needed to be developed as part of the Dynamic module and is available in the exide4u.com Website:

Knowledge Management Module

The **Knowledge Management module** has been designed to facilitate new employees who have joined the company recently. Online training is conducted for new joinees in order to gain knowledge on various types of products. Product information is disseminated section-wise. There are various chapters corresponding to each section.

Online Test

This online test module has been designed in order to enable new joinees to appear for the online test, which they can take up after reading up the study materials on product information.

In order to access the test module, employees are provided with User ID and Password. Questions from various chapters in the given sections are selected at random. New employees have to successfully pass the test in one section in order to move to the next section.

The following features had been envisaged for this section:

- Members' Login
- Section-wise, Chapter-wise Study Materials
- Assessment Module
- View Scores (Current / Past)
- Detailed Report for Administrator's Office

Battery Traction Module

This section aims to help users to find a battery which is the nearest fit for their application. The following technical calculations have been envisaged for this section.

Traction Battery Size Calculation:

This module helps to give battery size calculation. The calculation is done on the basis of input parameters of Voltage, Ampere-Hour and Dimension as provided by the customer. After receiving the inputs, the module processes several formulas and matches the existing records to send the information to the company's R/D department.

SAP-CRM interface Module

The **SAP-CRM interface Module** is the pivot of the Customer Relationship Management Portal. This section is meant for registered users only where Customers and Dealers can access relevant information. For accessing this module, registration is allowed from the Administrator's Panel. There is no provision for on-line registration.

On-Line Customer Survey / Feedback Module

This section has been designed to attract customer feedback for various surveys related to Product Quality, Product Features and Exide Service Team etc. Following scenarios are envisaged in this section.

- A feedback form is available as a link to each new article or product page. A user can go through the page give his feedback for that particular product/article by filling up the feedback form which requires the user to fill in mandatory details like Name, Address, and Email ID. The user has to add a subject line and write the feedback message which is forwarded to the Administrator, stored in the database, and/or sent to a designated email ID.
- This module also enables registered users to access customer survey forms online. Registered users are sent a link through a mail from SAP CRM, which directs them to the web portal where survey question forms are available. Survey questions can be answered by choosing options clicking on radio buttons / check boxes or drop down lists. User's options will be automatically stored in the database and will be made available for further analysis and report generation by the application.

Customer / Dealer Queries

This section will deal with specific queries from customers or dealers. Upon receipt of a query the Administrator or Suitable Persons (based on Regions) will be notified about the contents through a mail.

Site Search

Through this module, users would have the facility to search any keyword which is related to the contents of the site and can view detailed information on the same. All the data would be stored in the static HTML file and users can either search or navigate through the proper page.

Administrator Module

The primary task of this module is to manage the information database that would hold the various section names, contents, texts, sub-contents, headers, labels, links, path of the images etc. Any information that would be available in the site would be available in the database.

After the database information structure is ready, an extensive administration interface would be created. This interface will cater to the following tasks:

- Creating Master Sections & and their corresponding sub-sections – Add / Edit / Delete interfaces for entry of relevant information.
- The administrative users would have the facility to add a new section or modify an existing section. The design will be scalable so as to accommodate any new section that the administrator would like to add in the parent section.

- The administrator would have the facility to provide new User Id and Password to employees appearing for the Online Test and can set the module priority also.
- There will be provision for changing existing passwords. On clicking the 'Change Password' link on the login screen, a form will be displayed asking for User id, old password and new password. On submitting the form, password of the respective user will be changed.
- In case any user has forgotten his password, the module would help retrieve his password. In this case the user has to click the 'Forgot Password' button on the login screen, which will then display a form containing user details such as: user id, email id, address etc. After submitting the form, the user will be mailed his password by the System Administrator after verifying the authentication of the user.

A Snapshot

Key Issues

Challenges

(I) As the connection was not properly closed; it was observed that there was a JDBC leakage that was using up the JDBC resources and resulting in blockage of connection objects. This was causing the connection objects to be held up and as a result the application was hanging.

The major challenge laid in detecting the root cause of the problem. This was challenging as both the Tomcat Server and the MySQL Database Server were working smoothly, only the application server had errors. Once this problem was detected, detecting the areas of JDBC leakage was another major challenge as it was an internal issue pertaining to the application processing part.

(ii) As the battery traction module involved lots of mathematical and chemical calculations, formulation of the entire module seemed to be a very challenging task.

(iii) In the Knowledge Management area again, challenge faced was on partial form submission. The problem could be sorted out by means of AJAX technology after a lot of research.

Solutions Overview

The Applications were hosted on Tomcat 4.1 with MySQL 5.0 as the back end database. The Application was developed on Struts development framework, JSP, Java beans.

For a more detailed overview of the applications, please visit www.exide4u.com

Technology Specifications

Key Components	
Application	Customer Management Portal
Technology & Software	• Struts 1.1 • WSAD 5.0 • Tomcat 4.1 • J2EE 1.4 (JSP, Servlets, JavaBeans) • JavaScript 1.2 • AJAX • MySQL Database 5.0 • Dreamweaver MX

For more information, visit our Web site at: www.wdc.in