Order Management System and Logistics Networking Application Integration

Executive Summary:

Our client who is one of the leading logistics services providers operating in USA already had a Logistics Management system in place. Their initial system included two different applications, the first being the **Order Management System (OMS)** and the second one is the **Logistics application** for providing the logistics solution to their users.

While the OMS programmed in ASP is primarily used for managing the purchase order of a company, the Logistics Application programmed in PHP is used by the SMB logistics providers in order to manage their contacts/network, transactions and shipments across the world.

The foremost requirement of our client wanted us to provide more features to their users. Also they did not want to use Order management application and the Logistics Application in silos.

Hence they wanted us to integrate both these systems and use Order Management System as an Add-On Tool for the PHP application. There were other challenges involved in this project as well. Mindfire Solutions helped them integrate the OMS and Logistics Application and thus could meet the requirements of the client. Our skilled PHP developers who were on this project made the system fully functional and ensured that it ran perfectly without fail. Each system was provided with a separate login for the application and was accompanied by its own dedicated server.

About our client:

Client: Logistics Services Provider

Location: USA

Industry: Logistics/Transportation

Technologies Used:

ASP.Net 4.0 WCF, Classic ASP, SQL Server, C#, Entity Framework, Jquery, PHP, MySQL, JSON, SVN

Business Situation:

While the OMS is primarily used for managing the purchase order of a company, it also helps in tracking the details for the shipments for a particular purchase order as well as the details of when it is delivered to the end consumer. The other system i.e. the Logistics Application is used by the SMB logistics providers in order to manage their transactions and shipments across the world. Apart from that, it even helps in managing the company's employees' details and their activity. It also helps in connecting to different users present in different geographies.

The client wanted us to provide additional features in their existing applications to make it more user-interactive. Also the original OMS was being used as a stand-alone application. The client wanted us to integrate it with Logistics application and use Order Management System as Add-On-Tools for the PHP application.

The following were some of the key challenges that Mindfire faced:

- **Enabling Order Management System in the Logistics Application:**
  The client was interested to include a feature that would enable the Company Admin select Order Management System as "Add-On-Tools" in Logistics Application. All the Company employee and users in the company admin's network should be created in Order Management System.
- **Appropriate accessibility of the OMS to all the users:**
  There were around 12 types of uses in the OMS ASP application which had to to be integrated with 3 types of users in PHP application.
- **By pass the Order Management System login for the users:**
  There will be only one point of entry for all the users and that would essentially be the Logistics application. No user will be able to login in Order Management System. This is because the client wanted us to integrate the OMS and Logistics application such that any user when logged in the Logistics application is automatically logged on to the Order Management System.
- **Integrating the Shipment details in both the system:**
  The Shipment details should be updated in both the system. i.e. When the information are inserted/updated in the Logistics application it should be inserted/updated in the Order Management System and vice-verse.
- **Purchase Order and user integration:**
  The purchase order file is normally uploaded in the Order Management System. The file includes the information for the items to be shipped form one port to another. It also includes the users associated for the the same shipment. While uploading the file, the Order management System checks for the associated users in the system. In case the user is not found, the system automatically creates the user in the Order Management System. After the integration process, the system will also check the existence of users in the Logistics

application and when the user is created in Order management System, an invitation to join the Logistics Application should be sent to the non-existing users.

- **Order Management System for multiple companies:**
  Initially the Order Management System was designed for a particular type company i.e Companies operating in the logistics/transportation domain. Now our clients want to make it generic for use in all types of companies.

The Mindfire Solution:

The following were the solutions as provided by our skilled developers at Mindfire:

Since the Order Management System and the Logistics application were using two different technologies for the front end and two different databases for the back end, we created two major integration blocks. One of them is the **ASP.NET WCF service** which acts as an API for the Order Management System and other one is the **PHP Web API** which acts as API for Logistics application. These two API interacts with both of the application and accept information from the application. The APIs also update the information in their respective application. They are also responsible for the processing and integrating data for both the applications.

After duly discussing with the client, first we have differentiated the user types in each system so that we have equal number of user types in both the system. It is to be noted that initially the Order Management System was having 12 types of users where as there were only 3 types of users in the Logistics application. In order to solve this problem, we defined more user types based on their role in the company and the type of department they are associated with in the Logistics application. This really helped in integrating the users.

Solution Details

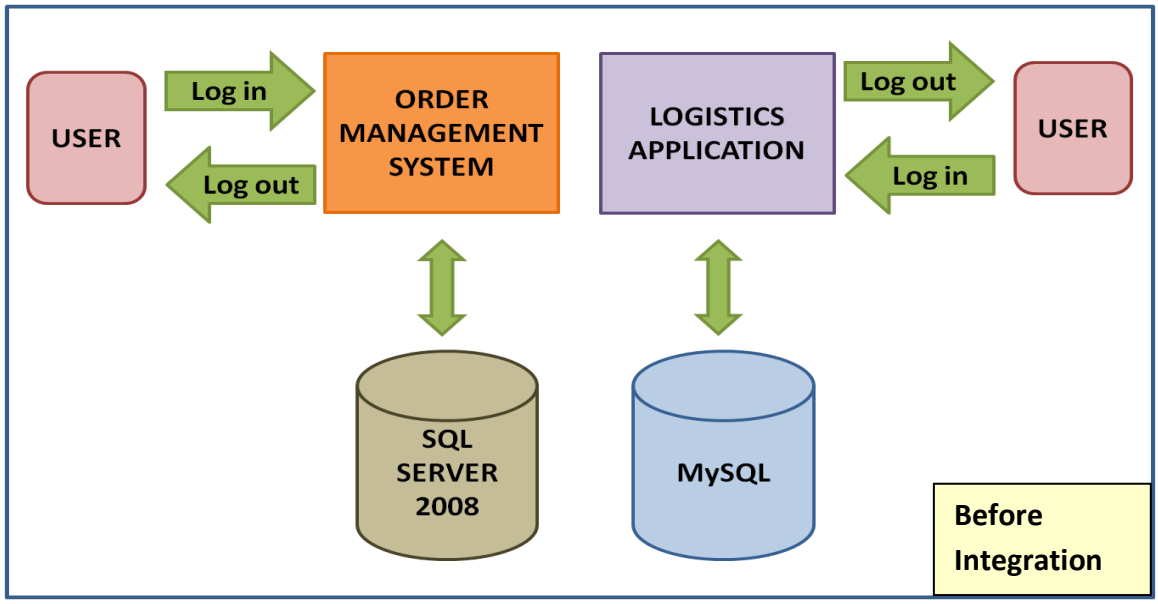
We took up challenges offered to us and solved it in the following manner:

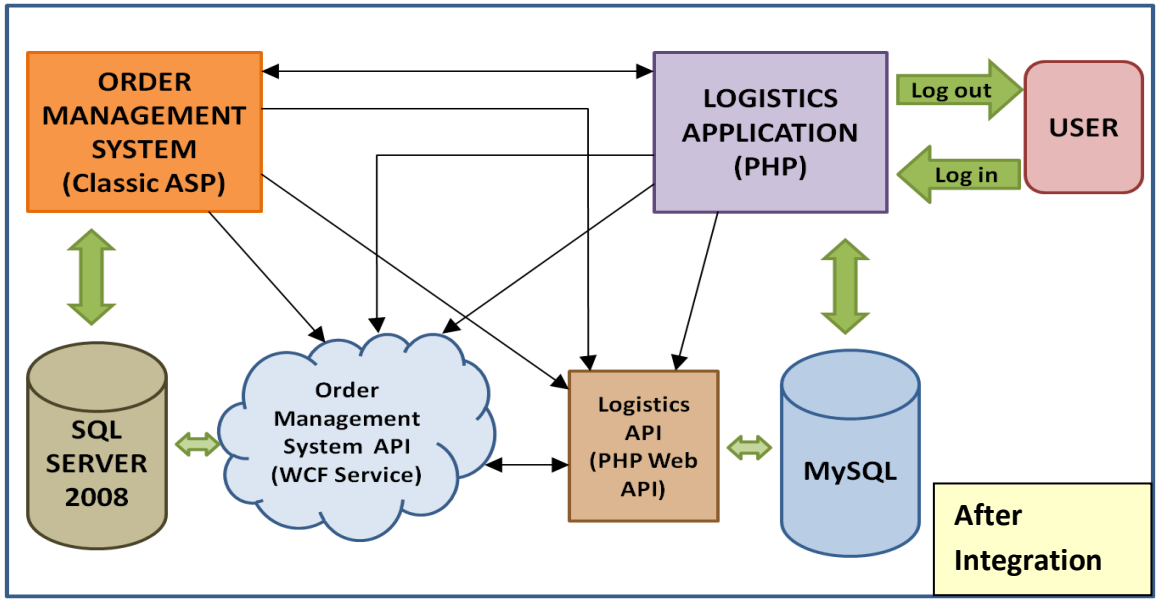
- **Enabling Order Management System in the Logistics Application:**
  When the Company Admin selects the Order Management System as Add-On-Tool in the Logistics application, the Logistics application immediately collects all the information related to the user, user's company, user's network members and posts all the data to Order Management System API. The Order Management System thereafter processes all the information and creates the same user in the Order Management System.
- **Appropriate accessibility of the OMS to all the users:**
  The user types that we have already discussed in the beginning of this project helped us to define the exact user types in the Order Management System while creating the users form Logistics application.
- **By-pass the Order Management System login for the users:**
  By-passing the login for the Order Management was a major task specifically for the integration purpose. When the Order Management System is enabled for a particular user in the Logistics application, the user is able to directly come to Order Management System from the Logistics application.

Behind the screen the Logistics application is interacting with the Order Management System and Order Management System is interacting with the Logistics API to make sure that the user is authenticated and authorized to use the Order Management System.

- **Integrating the Shipment details in both the systems:**
  When a user is creating a Shipment in the Logistics Application, the Order Management System is automatically enabled for that user. The Shipment gets completed in the Order Management System and data/information is updated in both the systems.
  This was achievable because in the background, the Logistics API is posting the user information and Shipment details to the Order Management System's API. The Order Management System then processes the information and associates the shipment details for that user. When the information is updated in the Order Management System, its API posts all the data to Logistics API and hence the information for the shipment is updated in both the system.
- **Purchase Order and user integration:**
  When the Purchase Order file is uploaded in the Order Management System, the system checks for the non-existing user in the Order Management System and its API checks for the non-existing user in the Logistics application via. the Logistics API. If the user is not present in the Order Management System the user is created automatically in the system and if the user is not present in the Logistics application, an invitation in the form of an email is sent to the users to join the Logistics application. If the user is not present in Order Management System and present in Logistics then we are creating the user in the Order Mangement System and mapping that user with the existing Logistics user.
- **Order Management System for multiple companies:**
  Initially the Order Management System was designed in such a way that it can be only used for a particular company. We have removed all the constraints that make the Order Management System specific to a particular company. Now the processes are dynamic and can accommodate all the changes as required. Also the system is flexible enough to work out for any company.

System Architecture Diagram:

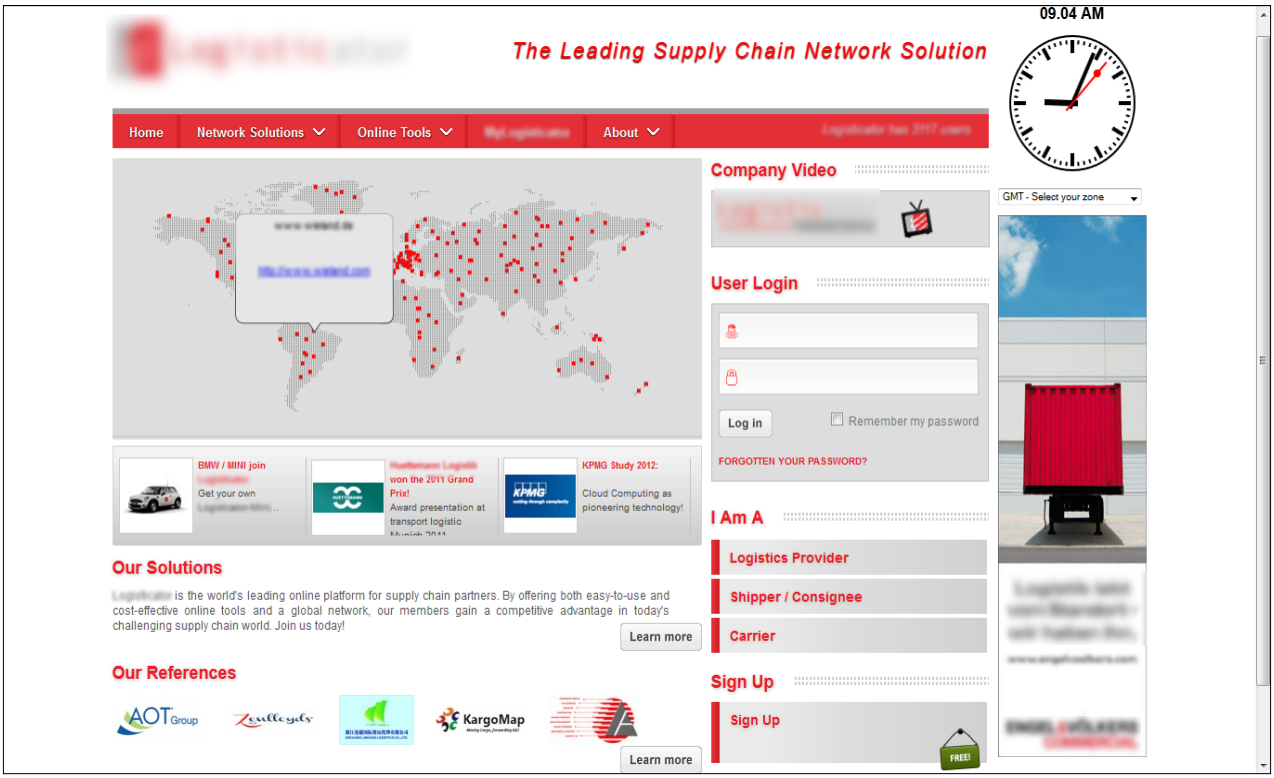




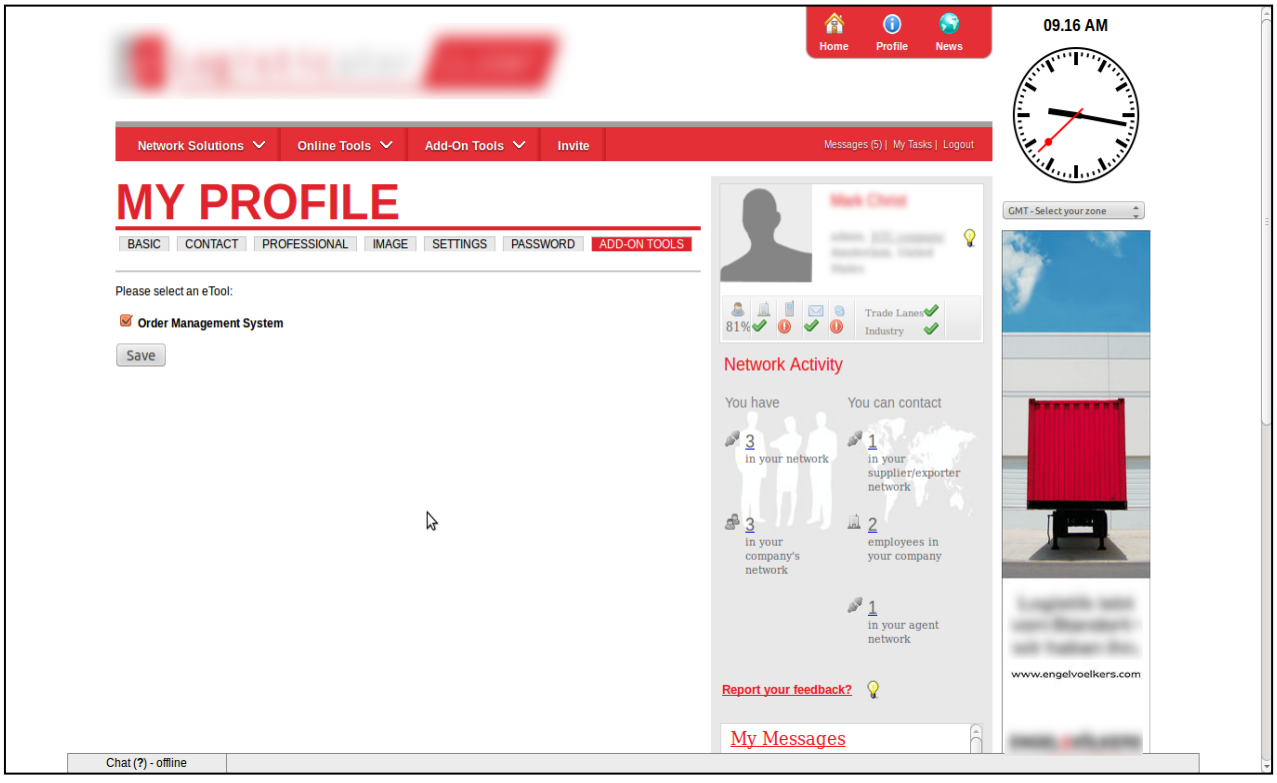
The following are some of the **key integration points**:

- Order Management System was developed using Classic ASP and SQL Server 2008 served as the back-end
- Logistics Application was developed using PHP with MySQL as the back-end.
- The Order Management System API is the ASP.NET WCF service
- Black single line arrows shows the integration processes that has been implemented

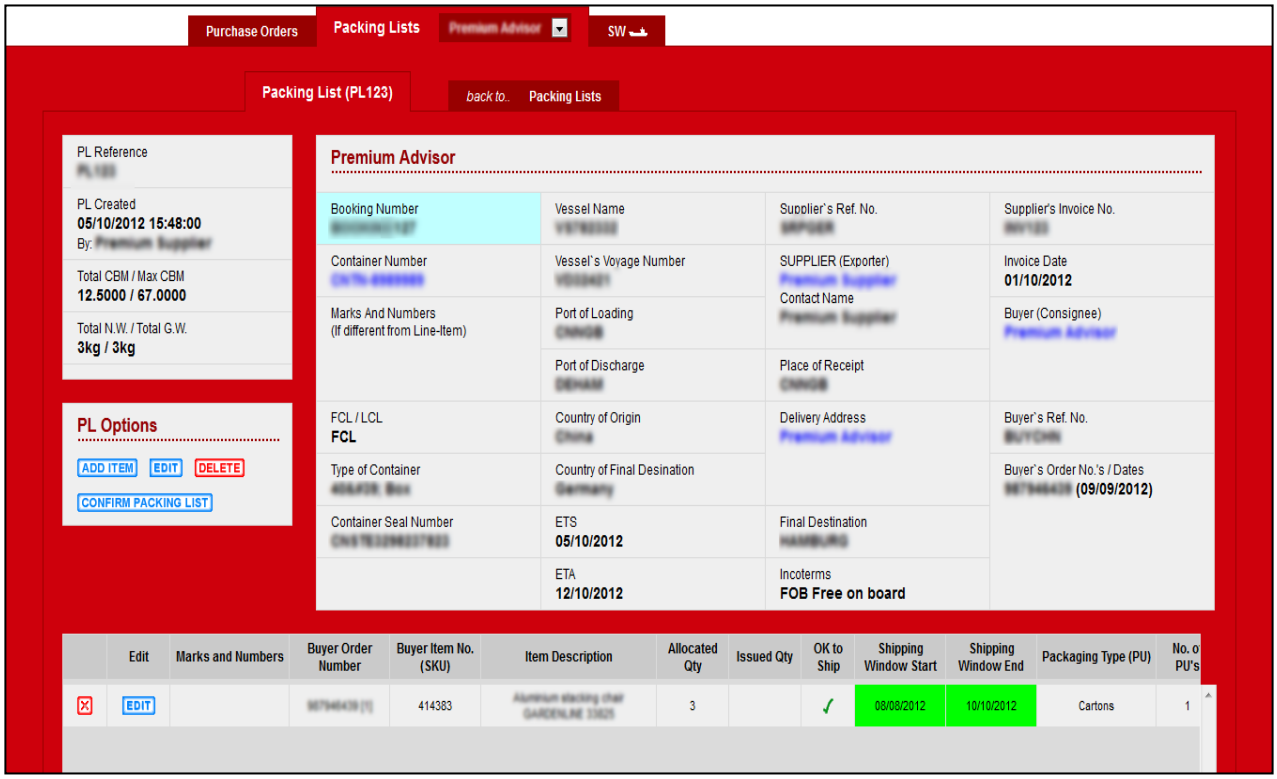
Illustrations:



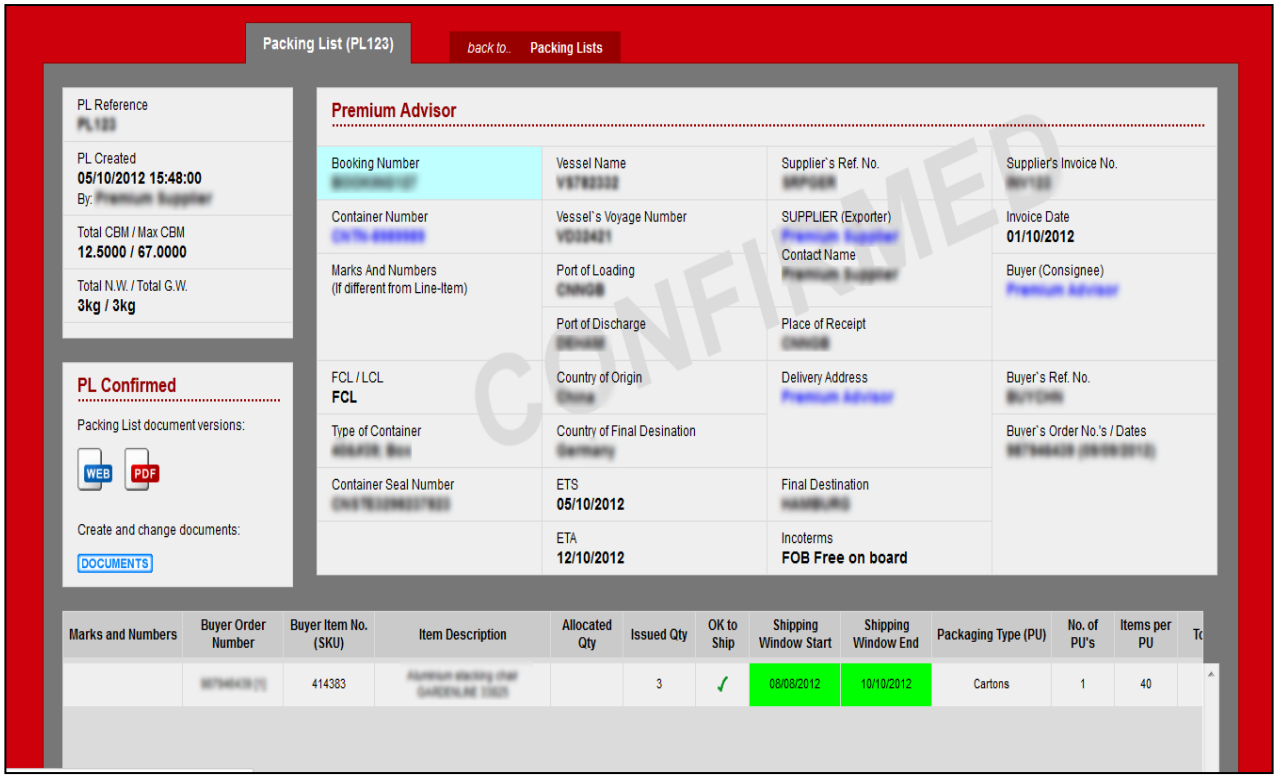
Screenshot 1: The client's website is shown in the above picture



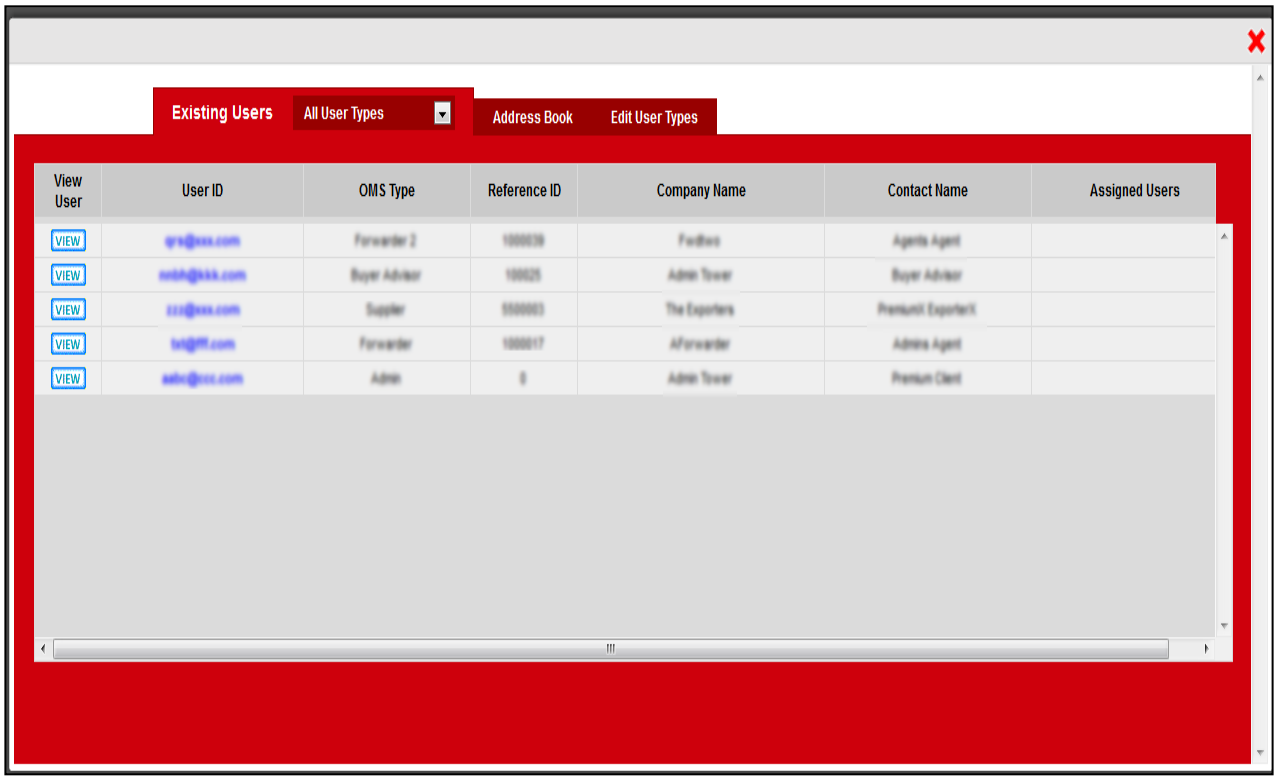
Screenshot 2: OMS depicted as an Add-on in the Logistics Application



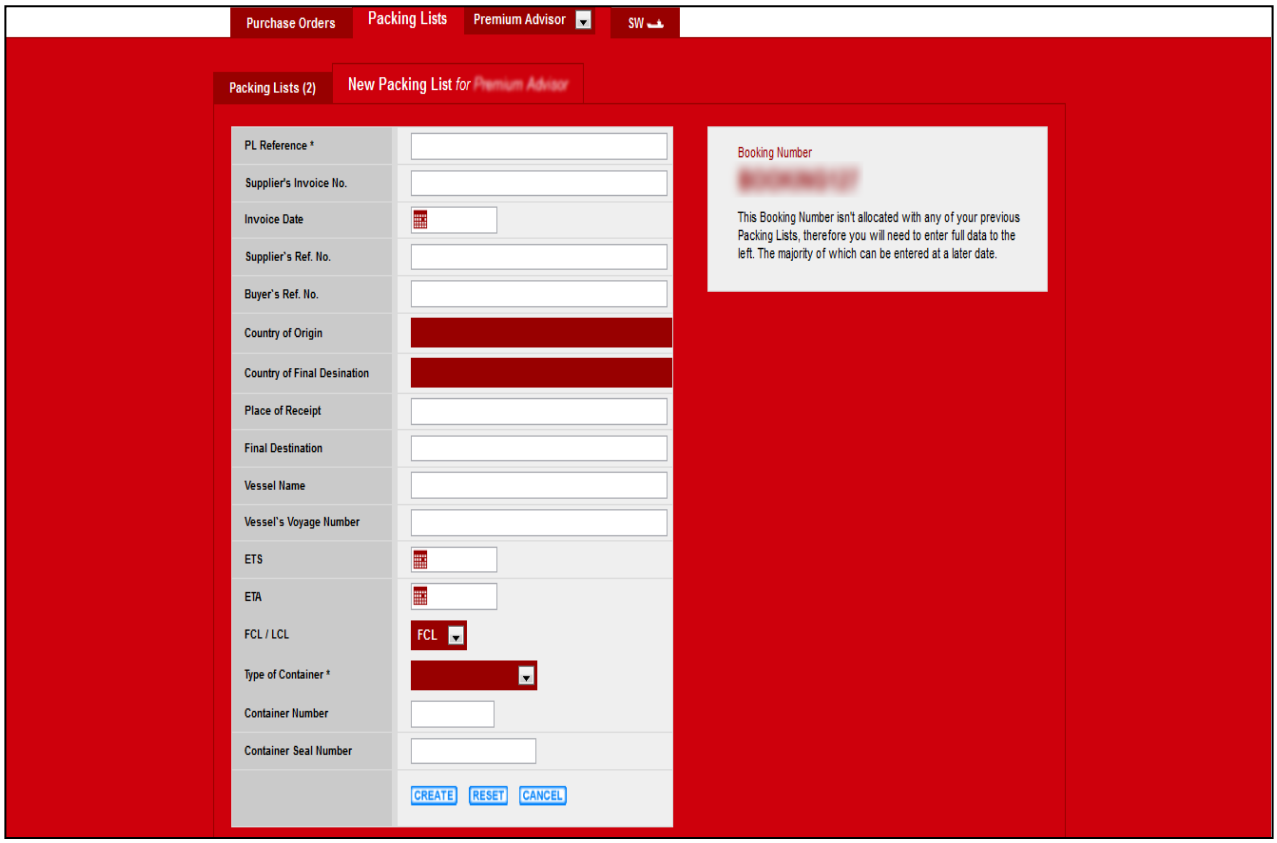
Screenshot 3: The items Purchase list as seen in the OMS.



Screenshot 4: The modified OMS as developed by Mindfire Solutions. Here we have integrated the shipment details.



Screenshot 5: A list of different types of users who are entitled to use the OMS.



Screenshot 6: A list of different types of users who are entitled to use the OMS.

Customer Benefits:

We at Mindfire Solutions helped our client successfully overcome the performance issues that were associated with the existing applications which were basically two large legacy systems implemented as stand-alone systems. We designed and implemented RESTful services in PHP and ASP to allow for integration of these systems in order to provide better and efficient access for its users.

The following are some of the ways in which the customer benefited by choosing Mindfire Solutions as its technology partner:

- Increased their efficiency to better manage their purchase orders and track shipments for their customers
- Implemented various interfaces to ensure seamless data exchange between the systems
- Integrated the two systems to achieve greater data consistency across the two databases
- Provided quality work at competent prices

Our ASP and PHP experts rose to the challenge and created an integrated system that handled data better, was feature-rich, a lot more scalable than its predecessor, and provided an intuitive business support platform for the client.

Future relationship:

A satisfying work experience with Mindfire Solutions has resulted in the client handing over some other projects to us besides considering us for future enhancements in this application.

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