BI for Performance Management

Real time reports to end users of a Telecom company

Client need

Client wanted to build a reporting application to present end users with real time reports after doing performance evaluation analysis on the data collected.
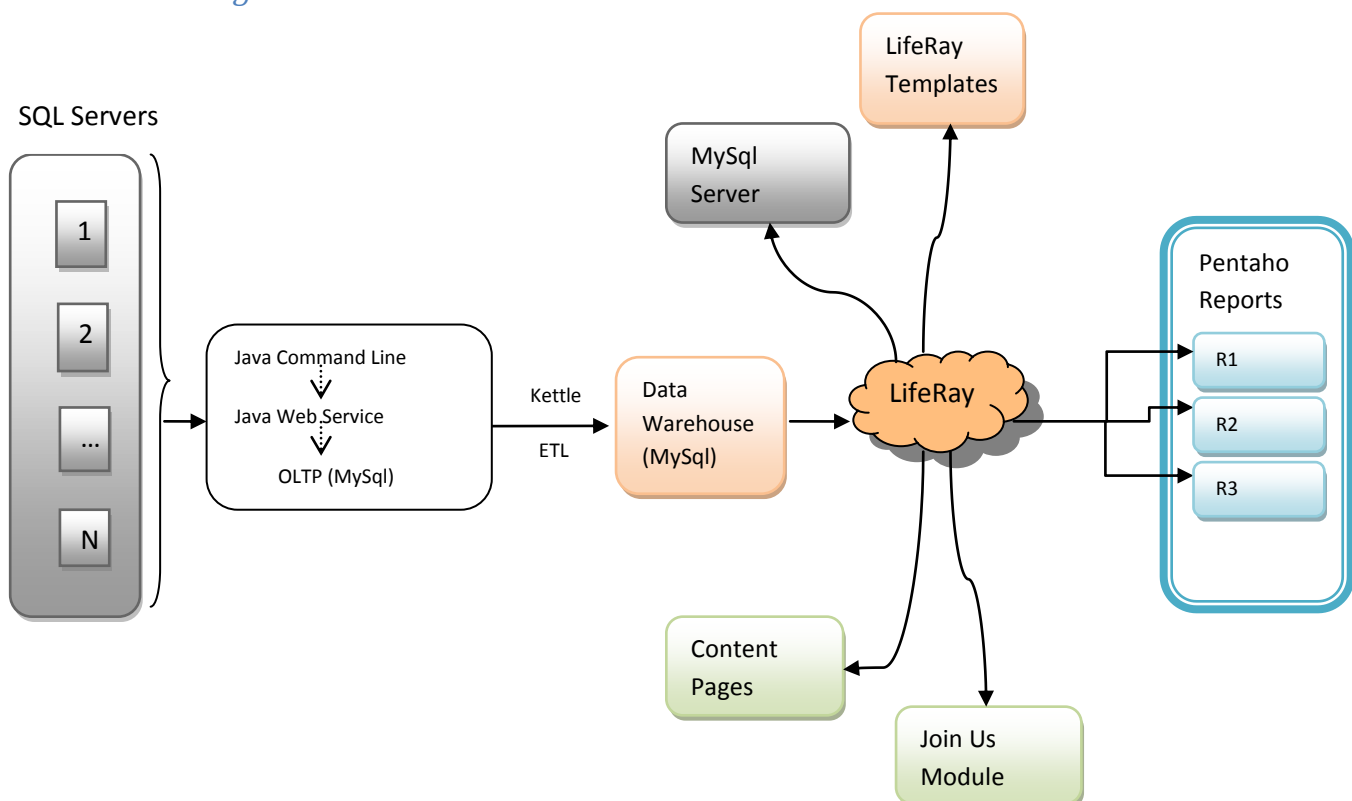
Our Solution

We got the application developed and delivered to client as per the requirement. The way we went about it is explained below:

This is an application shows near to real time reports to end users. Analytical data is collected from several end SQL users. After that the raw data is then processed by Pentaho data Integration (Kettle) to carry out the ETL process to persist the aggregated data in a data warehouse. The aggregated data is used in the reports. Reports are prepared using Pentaho Report designer and integrated in a LifeRay portlet using Pentaho Report Engine.

A diagrammatic flow would help understand the whole process more easily.

Architecture Diagram:

Application Components

Components

- ✓ Command line utility based on Java at Legacy OnSite solution.
- ✓ Web-service at CMRT server to publish data.
- ✓ OLTP database to persist call record transactions.
- ✓ Data Warehouse component for aggregation and reporting.
- ✓ Reporting platform to create reports.
- ✓ Portal for administration of software and to view client-specific parameterized static reports.

Command line utility at Legacy OnSite solution

A command line utility developed in JAVA to push data to web-service at CMRT server. It runs at each site. This utility fetches reporting related data from SQL Server database and pushes it to the web-service in JSON format. Only the required data for reporting gets sent. The data also contains a 32-bit key* along with the original data. This utility gets scheduled using OS schedulers and runs in the background.
*The key is site specific and it gets generated and distributed by the administrator.

Web-service at CMRT server to publish data

JAVA Servlet / RESTful web-services (depending on the performance) receive the post data in JSON format, and store it temporarily in a database. The response is sent after storing the data so that the command line utility does not wait for too long and server is not kept busy. The stored JSON data can be later processed asynchronously. The web-service also checks for the validity of key before saving data. In addition to key it also checks the IP. The lists of IPs are registered by the administrator for each site. If the IP is not found in the list of registered IP the data will be rejected.

OLTP database to persist call record transactions

A MySql database to store the call record transactions from the processed JSON data.

Data Warehouse component for aggregation and reporting

A MySql database is used for aggregation and reporting. Following methodologies were followed to bring this functionality, depending on performance:

- Kettle - used to synchronize data in between OLTP database and Data Warehouse.
- Direct MySQL synchronization with aggregation procedures.

Screen shots of the ETL process
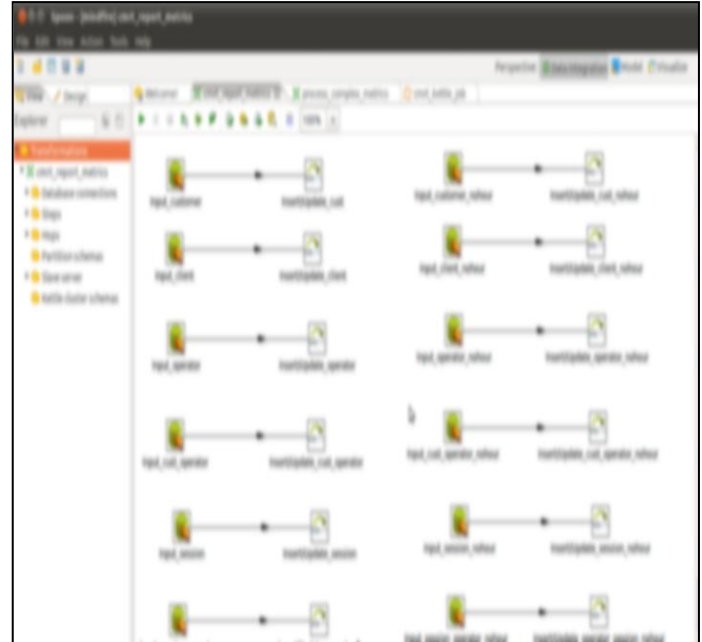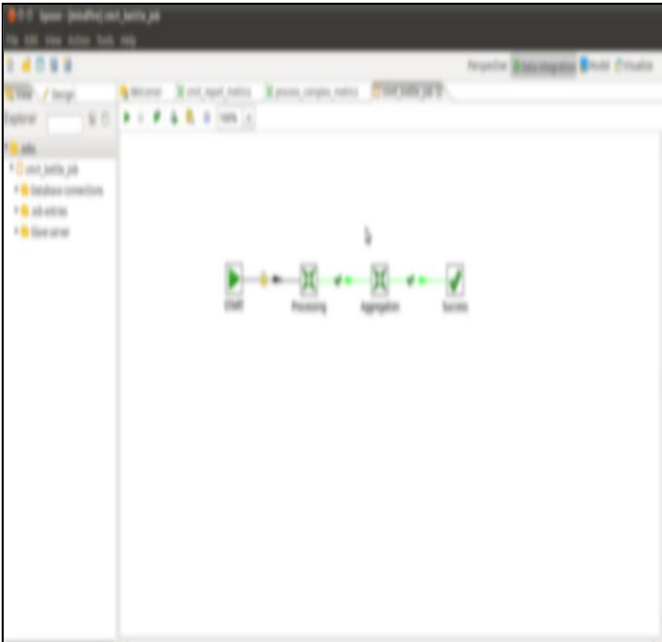
Reporting platform to create reports

Pentaho report designer was used to create parameterized static reports. The reports use the data from the data warehouse.

Portal to view client-specific reports

A web-portal was developed using LIFERAY/JSP for clients to view report. The portal has two kinds of users; administrators and client users.
User functionalities

⚔ Administrator

1. Register a site: The administrator generates the key for the site and provides it to the site administrator to register the command line utility.
2. Register IP: The administrator registers the list of IPs, which post data, for each site.
3. Register clients: The administrator registers clients for each site. Clients are provided (via email) with site id, client id and password; all these information are required to be logged in the portal.
4. Role based access: The administrator provides permission for each client to view reports.
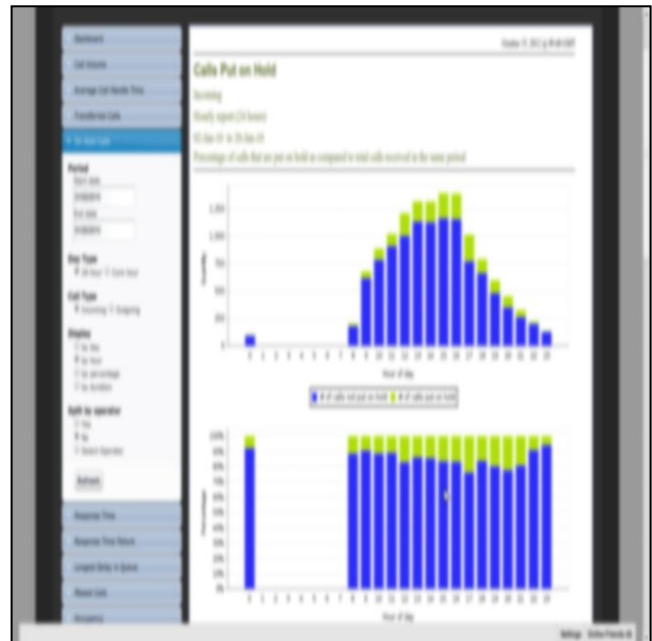
Admin Section reports

 ⤷ User
   1. User sees a menu showing the list of reports he is entitled to view. On choosing the reports he has to enter the parameters (if required) to view reports.

User report screen shots

About our Client

Client Telecom (Customer Service)| **Location** UK | **Industry** Management Consulting

Technologies

Java, Pentaho Report Engine, Pentaho Kettle, LifeRay

Future relationship

The client was pleased with Mindfire's effort and reckoned that they were happy to have discovered a professional offshore IT unit. We shall continue to be the service provider for the next versions of the client's product. They have not only allocated the support and maintenance work of the current system to Mindfire but have also chosen us for future customization work.