

# Content

---

Introduction

Engagement Objective

Engagement Structure, Deliverables and Status

Engagement Details

Engagement Outcome

Lessons Learnt

Question & Answers

# Introduction

---



Piyush Ahuja

## Information About You

- 4<sup>th</sup> Year Student, Department of Mathematics
- Academic Interests : Algorithmic Game Theory, Stochastic Modelling
- Based on the internship, have been extended a job offer which will be confirmed only next year.

## **Summer internship program**

### **Final Presentation as part of Colloquim**

Date: November 8, 2011

Presented by :  
Piyush Ahuja

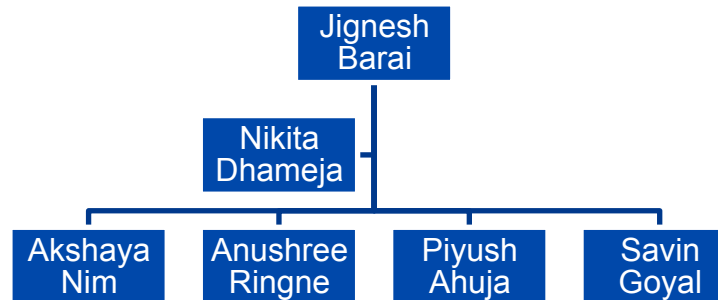
## Engagement Objective

Build a Decision Support System from the raw data of Communication Excellence Program, aimed at improving the efficiency and effectiveness of the program by providing vital strategic information.

The system will support faster and better decision-making, incorporating various computing techniques in identifying, extracting and analyzing Business Data.

## Engagement Structure, Deliverables and Status

### Team Structure



### Deliverable Details

| # | Deliverable Name                   | Del. Date    | %age Completion | Status | Remarks |
|---|------------------------------------|--------------|-----------------|--------|---------|
| 1 | Theoretical Data Model             | Jun 15, 2011 | 100%            | Done   | -       |
| 2 | Technical Specifications of Tables | Jun 17, 2011 | 100%            | Done   | -       |
| 3 | Unit Test Document                 | Jun 27, 2011 | 100%            | Done   | -       |
| 4 | Combined ETL Code                  | Jul 6, 2011  | 100%            | Done   | -       |
| 5 | Final Code                         | Jul 19, 2011 | 100%            | Done   | -       |

## Engagement Details - Overview

---

- CE Database (Operational System) – day to day operations – doesn't provide strategic information.
- Two observations :
  - (1) Program has lots of data – Monthly CE Alert Sheet with data for all employees
  - (2) Requirement of technology resources and systems effective at turning all that data into useful strategic information.

Strategic information in the form of readily accessible, user-friendly and instantaneous reports of aggregated data .

## Engagement Details - Objectives

---

- Database for analytical tasks – Provide an integrated and total view of the CE data
- Storage of both current and historical data.
- Data flow design for periodic and stable update of content.
- Interface permitting direct interaction with the system by the users without IT assistance.
- Ability for users to run queries, initiate reports and get results online and on the fly.
- Make decision-support transactions possible without hindering operational systems

## Engagement Details – My Approach

---

- Employed Data Warehousing.

Maintains its functions in three layers - staging, integration, and access

- Dimensional approach : Transaction data partitioned into either "facts", generally numeric transaction data, or "dimensions", the reference information that gives context to the facts
- Relational OLAP.
- History Preservation through SCD 2.



## Engagement Details - Approach

---

Steps followed –

- Requirement Gathering
- Physical Environment Setup – Getting the servers and softwares running
- Data Modeling – Conceptual Model -> Logical Model -> Physical Model
- ETL – Data Mapping
- Report Development
- Performance Tuning – Query Optimization
- Quality Assurance – Rigorous Test Plan

## How did I achieve the objectives

---

- Database Tables - MySQL5.0 queries
- Dimension Tables(SCD2) - SAP Business Objects Data Services Designer
- Testing - Manually and MYSQL5.0 queries
- Universe(interface & cardinality) - SAP Business Objects Enterprise Designer
- Report Generation - Web Intelligence Rich Client
- Creation of users with access rights - Central Management Console

## Activities I Accomplished

---

- Single click jobs for
  - Data dumping into the database staging area, from excel sheets
  - Data flow from the staging area into the dimension tables, ensuring SCD2
  - Data flow from the dimension tables into the fact table
- Data updates and refreshing in the universe
- Reporting via web intelligence rich client

## Resources

---

### Tools

- MySQL 5.0
- SAP Business Objects Data Services Designer
- SAP Business Objects Universe Designer
- SAP Business Objects Web Rich Client
- Info View

### Reference Material

- Data Warehousing Fundamentals by P.Ponniah
- OCA Oracle Database 11g: SQL Fundamentals 1 by J.Watson

# Engagement Outcome

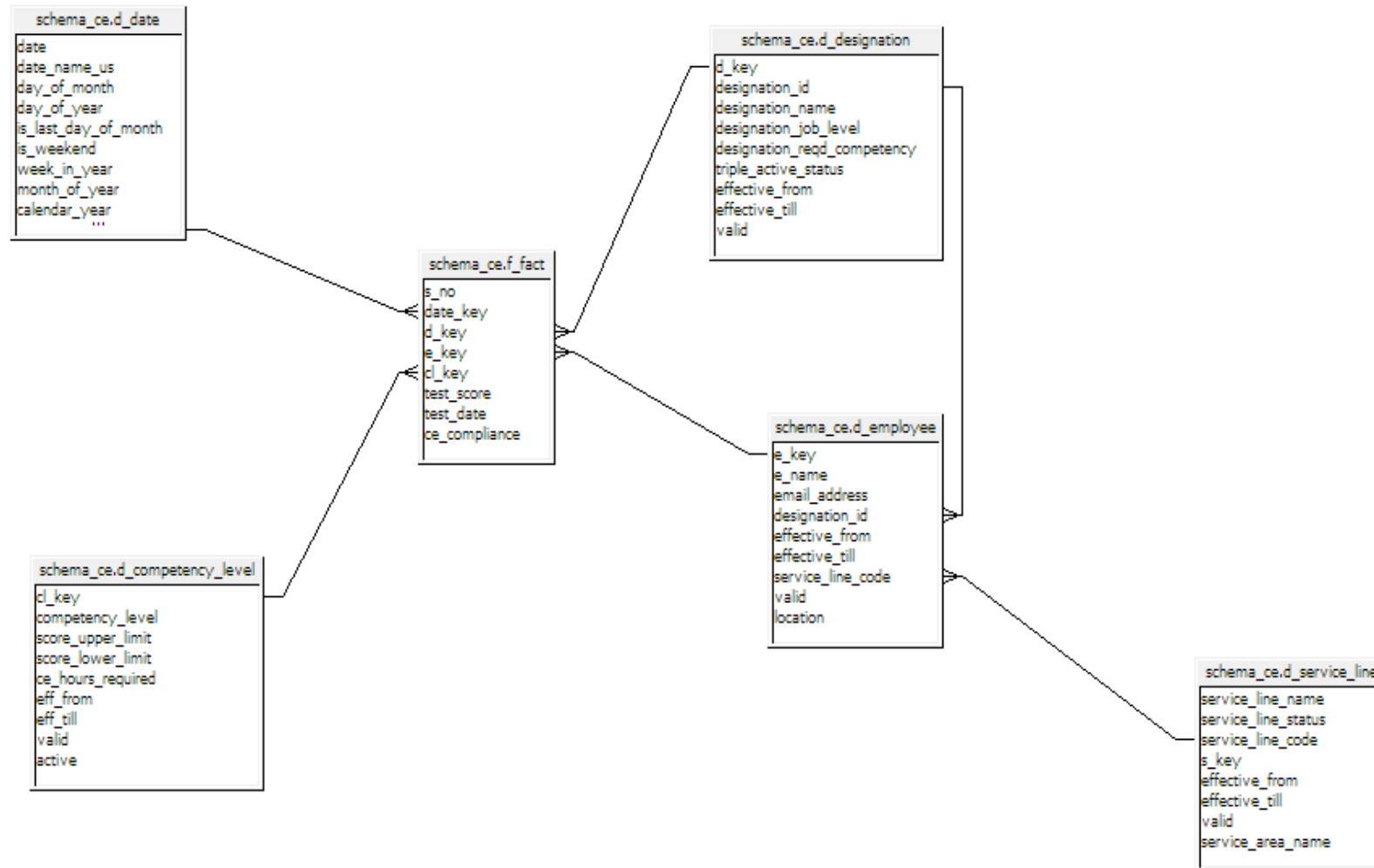
## Data Source – Excel Sheet

Copy of Sample CE Alert sheet - Consulting.xlsx - Microsoft Excel

|    | A           | B                          | C            | D                | E                   | F                        | G            | H           |
|----|-------------|----------------------------|--------------|------------------|---------------------|--------------------------|--------------|-------------|
|    | Full Name   | E-Mail Address             | SAP Function | SAP Service Area | SAP Service Line    | SAP Designation          | SAP Location | Job level   |
| 1  |             |                            |              |                  |                     |                          |              |             |
| 2  | Aachman     | urduy.for.u@gmail.com      | CONSULTING   | Technology       | Information Manager | MANAGER                  | Hyderabad    | MANAGER     |
| 3  | Aadesh      | hmva@iitk.ac.in            | CONSULTING   | Technology       | Information Manager | FIRM DIRECTOR            | Mumbai       | SR. MANAGER |
| 4  | Aadi        | sobhan_klnv@yahoo.com      | CONSULTING   | Technology       | Information Manager | SENIOR/SENIOR CONSULTANT | Mumbai       | SENIOR      |
| 5  | Aafreen     | artul@iitk.ac.in           | CONSULTING   | Technology       | Information Manager | MANAGER                  | Mumbai       | MANAGER     |
| 6  | Aakar       | indebtanup@gmail.com       | CONSULTING   | Technology       | Information Manager | SENIOR/SENIOR CONSULTANT | Hyderabad    | SENIOR      |
| 7  | Aakash      | abhayk@iitk.ac.in          | CONSULTING   | Technology       | Information Manager | SENIOR/SENIOR CONSULTANT | Hyderabad    | SENIOR      |
| 8  | Aalap       | imple.daffodils@gmail.com  | CONSULTING   | Technology       | Information Manager | SENIOR/SENIOR CONSULTANT | Mumbai       | SENIOR      |
| 9  | Aandaleeb   | vvivek.patel@gmail.com     | CONSULTING   | Technology       | Information Manager | STAFF/CONSULTANT         | Hyderabad    | STAFF       |
| 10 | Aashish     | aimmaneni@yahoo.com        | CONSULTING   | Technology       | Information Manager | MANAGER                  | Mumbai       | MANAGER     |
| 11 | Abeer       | evan@iitk.ac.in            | CONSULTING   | Technology       | Information Manager | SENIOR/SENIOR CONSULTANT | Mumbai       | SENIOR      |
| 12 | Abhay       | jagga.sonam@gmail.com      | CONSULTING   | Technology       | Information Manager | MANAGER                  | Mumbai       | MANAGER     |
| 13 | Abhayananda | andonvs@iitk.ac.in         | CONSULTING   | Technology       | Information Manager | STAFF/CONSULTANT         | Hyderabad    | STAFF       |
| 14 | Abhayaprada | aytalatam@gmail.com        | CONSULTING   | Technology       | Information Manager | MANAGER                  | Mumbai       | MANAGER     |
| 15 | Abheek      | nitish.sri89@gmail.com     | CONSULTING   | Technology       | Information Manager | SENIOR/SENIOR CONSULTANT | Mumbai       | SENIOR      |
| 16 | Abhi        | fragrancofife.17@gmail.com | CONSULTING   | Technology       | Information Manager | MANAGER                  | Mumbai       | MANAGER     |
| 17 | Abhibhava   | alithkumar987@gmail.com    | CONSULTING   | Technology       | Information Manager | SENIOR/SENIOR CONSULTANT | Mumbai       | SENIOR      |
| 18 | Abhicandra  | shubhji@iitk.ac.in         | CONSULTING   | Technology       | Information Manager | MANAGER                  | Hyderabad    | MANAGER     |
| 19 | Abhidi      | akrai@iitk.ac.in           | CONSULTING   | Technology       | Information Manager | SENIOR/SENIOR CONSULTANT | Hyderabad    | SENIOR      |
| 20 | Abhilita    | indal.abhilash@gmail.com   | CONSULTING   | Technology       | Information Manager | SENIOR/SENIOR CONSULTANT | Mumbai       | SENIOR      |
| 21 | Abhijat     | shubhu@iitk.ac.in          | CONSULTING   | Technology       | Information Manager | SENIOR/SENIOR CONSULTANT | Mumbai       | SENIOR      |
| 22 | Abhijaya    | sarpit@iitk.ac.in          | CONSULTING   | Technology       | Information Manager | STAFF/CONSULTANT         | Hyderabad    | STAFF       |
| 23 | Abhijit     | itzsid@gmail.com           | CONSULTING   | Technology       | Information Manager | FIRM DIRECTOR            | Hyderabad    | SR. MANAGER |
| 24 | Abhijvala   | erwalniv@gmail.com         | CONSULTING   | Technology       | Information Manager | MANAGER                  | Bengaluru    | MANAGER     |
| 25 | Abhilash    | bishal303@gmail.com        | CONSULTING   | Technology       | Information Manager | SENIOR/SENIOR CONSULTANT | Mumbai       | SENIOR      |
| 26 | Abhimand    | ishyadav0103@gmail.com     | CONSULTING   | Technology       | Information Manager | STAFF/CONSULTANT         | Mumbai       | STAFF       |

## Engagement Outcome – Contd.

### Implemented Data Model



## Engagement Outcome – Contd.

Tables and Data Flow using Business Objects Data Services

**Project Area**

- [-] project\_ce
  - [-] j\_dcs\_d\_stg\_d\_date
    - [+] df\_dcs\_stg\_d\_date
  - [-] j\_dcs\_src\_dimension\_fact
    - [-] wf\_dcs\_src\_stg
      - [+] df\_dcs\_src\_ce\_alert\_dump
      - [+] df\_dcs\_src\_d\_competency\_level\_temp
      - [+] df\_dcs\_src\_d\_service\_line1
    - [-] wf\_dcs\_stg\_dimension
      - [+] df\_dcs\_stg\_d\_competency\_level
      - [+] df\_dcs\_src\_d\_designation
      - [+] df\_dcs\_src\_d\_service\_line2
      - [+] df\_dcs\_src\_d\_employee
    - [-] wf\_dcs\_dimension\_fact
      - [+] df\_dcs\_dimension\_f\_fact

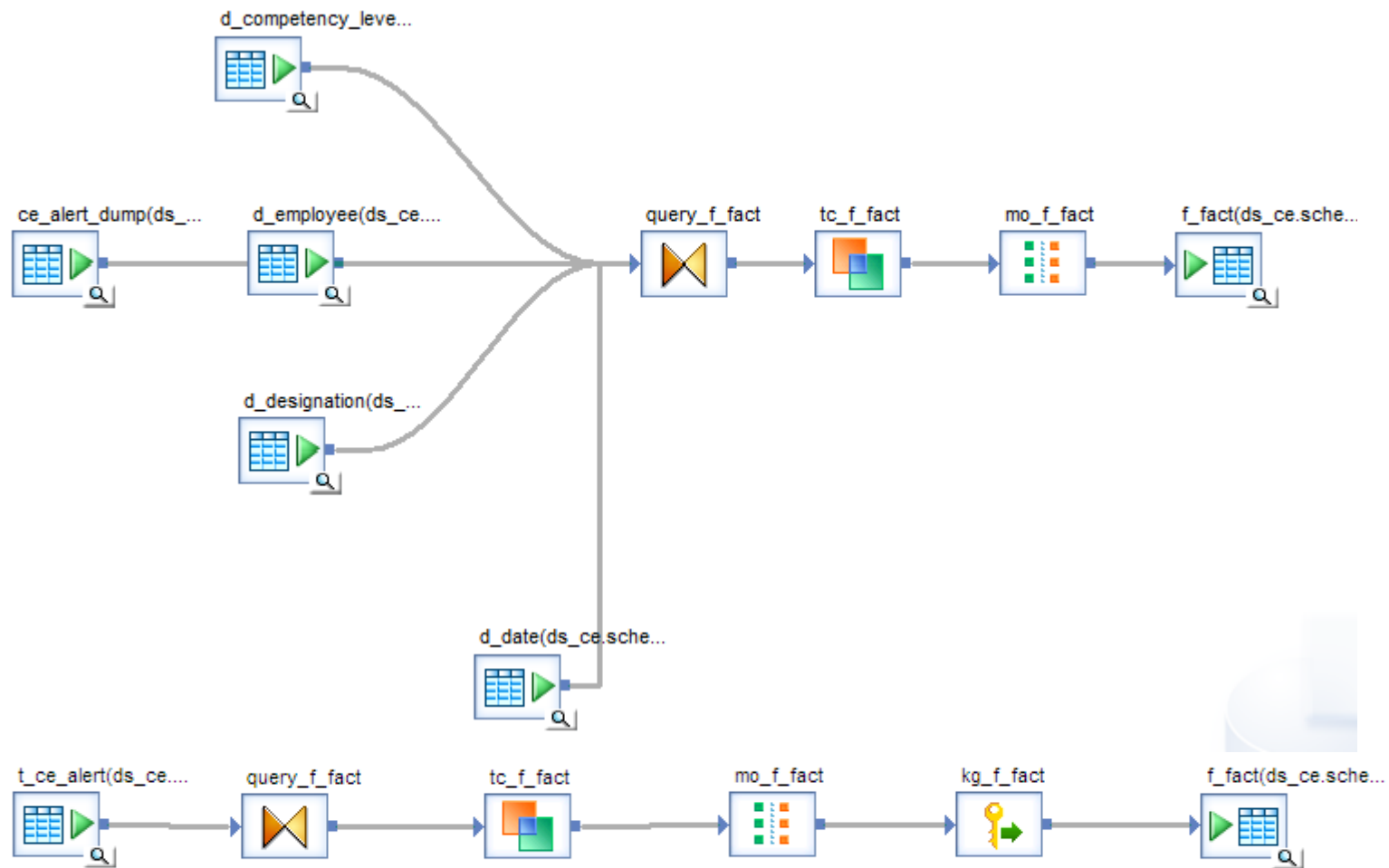
**Local Object Library**

Repository: MySQL.DataServices.root

| Datastore                         | Usage | Description           |
|-----------------------------------|-------|-----------------------|
| [-] ds_ce                         |       |                       |
| [-] Tables                        |       |                       |
| d_competency_level(ds_ce.sche...  | 6     | InnoDB free: 21504 kB |
| d_date(ds_ce.schema_ce)           | 3     | InnoDB free: 11264 kB |
| d_designation(ds_ce.schema_ce)    | 7     | InnoDB free: 20480 kB |
| d_employee(ds_ce.schema_Ce)       | 6     | InnoDB free: 19456 kB |
| d_service_line(ds_ce.schema_ce)   | 6     | InnoDB free: 19456 kB |
| f_fact(ds_ce.schema_ce)           | 6     | InnoDB free: 19456 kB |
| t_ce_alert(ds_ce.schema_ce)       | 3     | InnoDB free: 19456 kB |
| t_competency_level(ds_ce.schem... | 2     | InnoDB free: 19456 kB |
| t_service_line(ds_ce.schema_ce)   | 2     | InnoDB free: 19456 kB |
| [+] Template Tables               |       |                       |

## Engagement Outcome – Contd.

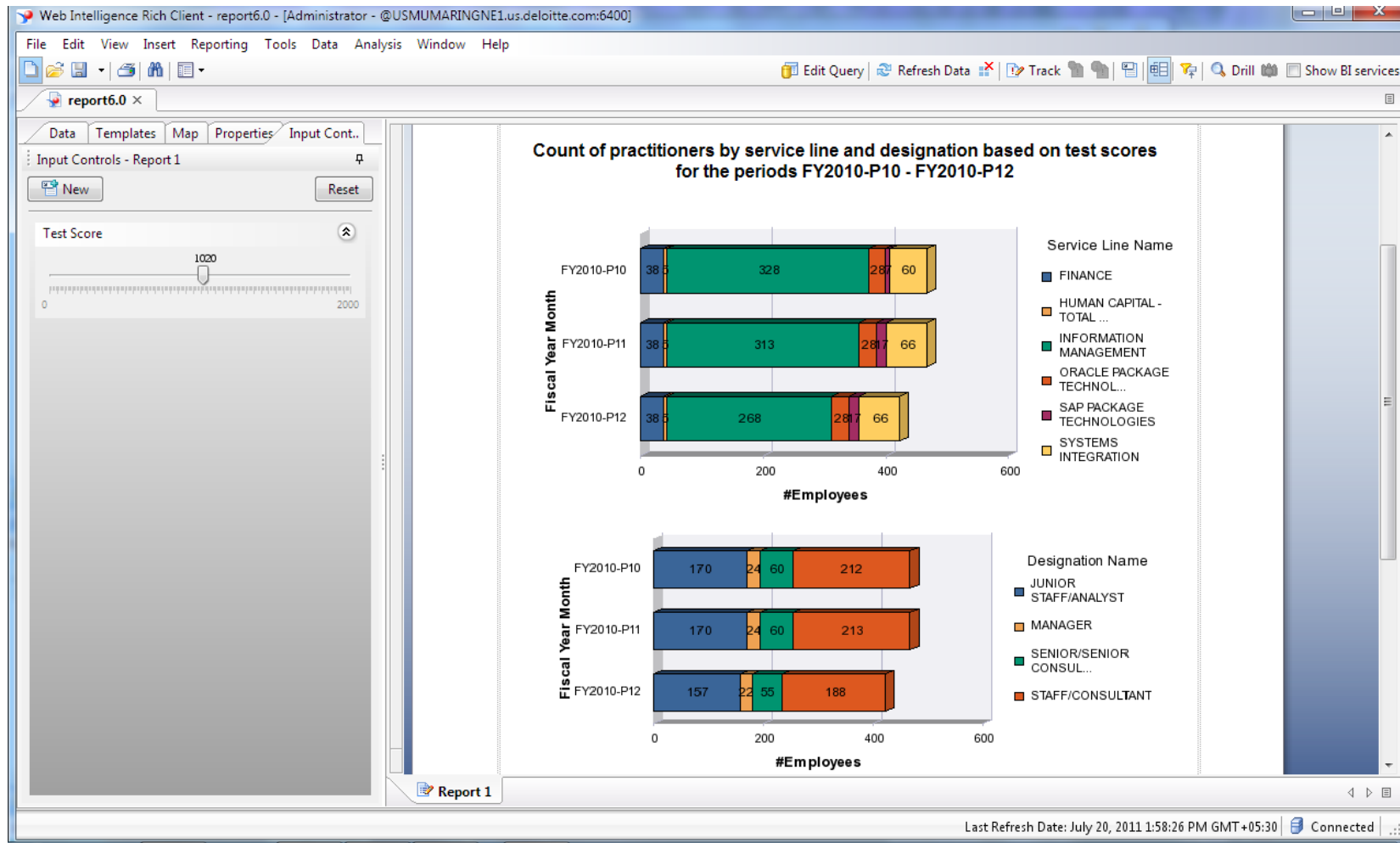
ETL using Business Objects Data Services





# Engagement Outcome – Contd.

## Reporting through Business Objects Enterprise



## **The Lessons I Learnt**

---

- Learnt the essentials of planning for a data warehouse and distinguishing between data warehouse projects and OLTP system projects.
- Understand Data Warehouse architecture and how the framework supports flow of data.
- Examine the data extraction function, its challenges, its techniques, and learn how to evaluate and apply the techniques
- Learnt how to adapt the life cycle approach for a data warehouse project.
- Discussed project team organization, roles, and responsibilities.

# Q&A

**Deloitte.**

Copyright © 2010 Deloitte Development LLC. All rights reserved.

Member of  
**Deloitte Touche Tohmatsu**