

Subject :

To develop a Business Intelligence System pour the store sales by using the EMODE Database.

**Part 1 : ETL functions implementation**

1. Take in consideration the data quality

Write the SQL queries to verify the data quality in the Oracle tables.  
Identify the primary keys in double and the foreign key missing  
The invalid data must be stored in one or more reject table

Provide the SQL scripts in your report.

**2. Develop SSIS packages:** to transfer all the tables (structure and data) from the Oracle EMODE Database to a SQL Server 2008R2 Database.

Development conditions of the transfer packages

**2.1. First package**

To transfer the totality of the datas stored in the necessary tables from Oracle to SQL Server.

These procedure must integrate a data delete in the destination tables by using a Truncate table SQL instruction.

Warning: you must take in consideration the existing foreign keys, because they can block the truncate operation, if necessary you can disable the foreign key constraints. Then transfer all the data.

The non-conform data to the data quality must be traced in one or more reject tables.

**2.2. Second package**

**This package** integrate the transfer trace with **an audit table create with an SQL instruction.**

The data load must be **incremental**: only the new data (insert, update and delete) in the source table within the Oracle database must be treated.

Attention in case of modification of the source table structure, must work only on a copy of the data by duplicating the new table structure and associated data in a new Oracle schema: **EMODE\_INC**. This schema must be created by the create user instruction.

This also implies the data transfer in this new schema.

You can use audit tables managed by the application.

Distinguish the table that permits to trace de load operation (with the transfer number, the transfer date and time, as well as the overall status of the load operation) from the detailed table (with the table name, the primary key value and also information about the source of the problem).

The needed tables as to be created with a « Create table » + « Insert » instruction in the trace table, in case of a problem.

### **2.3. Third package**

integrate the transfer trace by using the audit functions provided by Integration Services

### **2.4. Managing aggregation tables thru a fourth specific package**

The aggregation tables update will be done by a total data deletion, followed by a new insertion by using the refreshed data in the reference tables.

This package must be called by the 3 preceding packages.

### **2.5. Automating the process**

The package can be executed immediately.

The package can be executed by a scheduled task a the operating system

The package can be executed by a job defined in SQL Server Agent.

### **2.6. ETL Test**

Provide an initial loading: all the tables are empty in the destination database (SQL Server 2008)

Provide a second loading: by executing a SQL script in the database by including inserting new data in the fact tables and in the associated dimension tables.

Example: provide data on the first week of **january 2014**

## **Part 2 : Data Warehouse Optimizsation**

1. Implementation of table partitioning for the facts table in the SQL Server 2008

2. Create an Analysis Services Project:

Including the cube and dimensions creation.

Explore the cube thru temporal and geographic hierarchies

## Partie 3 : Implementation of reporting

### 3.1. Create a **Reporting Services** project

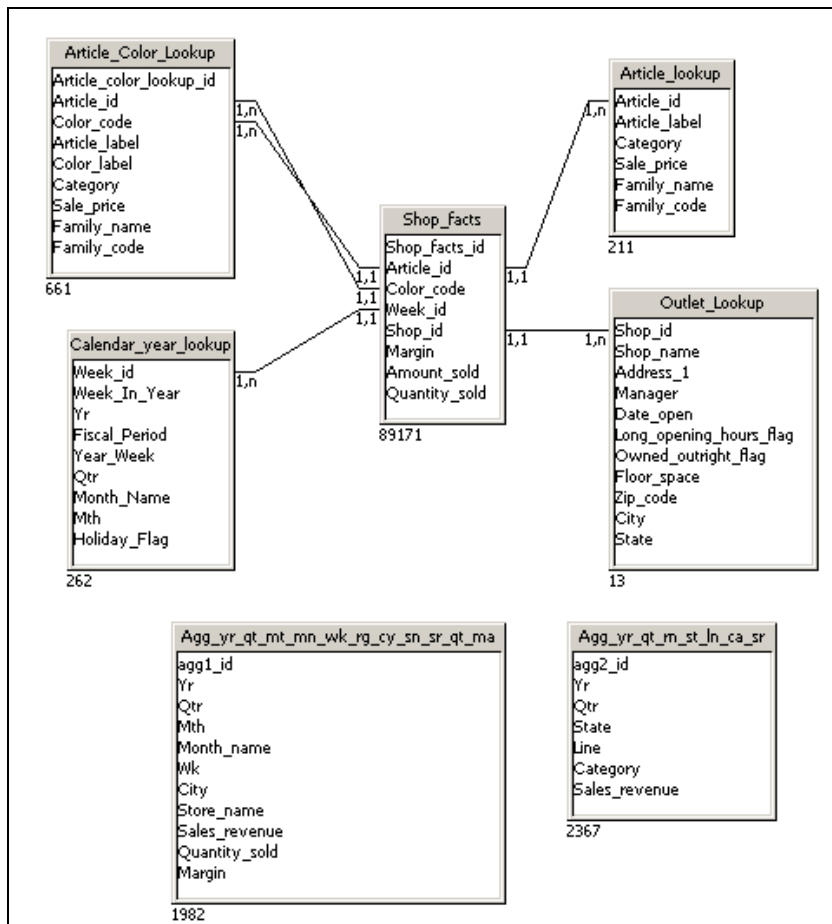
Develop reports by using: vertical table, cross table and charts.

### 3.2. Create a **BO Universe**

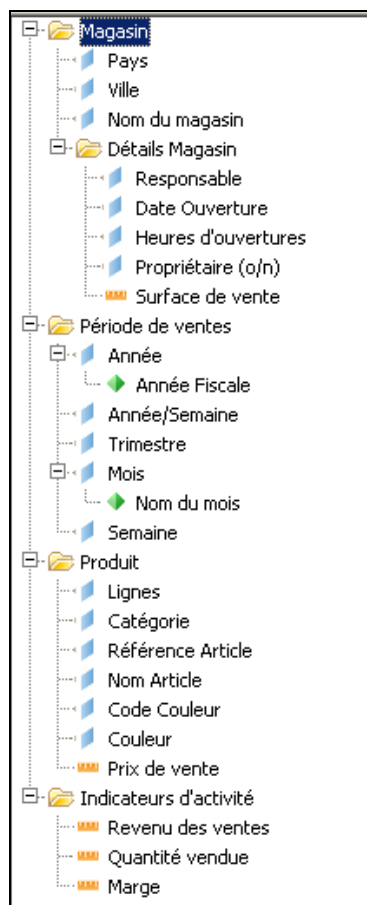
Use the star model with the fact tables SHOP\_FACTS

Setting up aggregate navigation

First Star Model to implement:



The business objects must be organized as follows



### 3.3 Create reports with Web Intelligence.

Example of reports to build with Interactive Analysis or Web Intelligence

First Document : B01SalesRevenueAnalysis.wid

#### Query

**Result Objects**

 Year

 Month

 State

 Sales revenue

#### First Report

Sales Analysis by Geography and Time												
2004	2004											
	1	2	3	4	5	6	7	8	9	10	11	12
California	\$178,186.40	\$120,204.50	\$220,829.50	\$185,423.30	\$163,346.30	\$92,724.60	\$115,918.10	\$36,010.70	\$242,379.80	\$141,647.80	\$100,113.60	\$107,426.20
Colorado	\$41,686.80	\$35,181.30	\$54,928.80	\$55,378.40	\$43,661.00	\$30,036.90	\$33,139.60	\$9,012.10	\$43,469.20	\$38,580.90	\$27,832.90	\$35,393.60
DC	\$74,120.30	\$48,128.20	\$86,075.90	\$82,401.20	\$60,683.00	\$36,778.90	\$48,804.30	\$14,281.20	\$68,601.20	\$78,923.20	\$40,881.40	\$53,531.70
Florida	\$55,731.50	\$31,099.40	\$50,698.80	\$41,044.10	\$49,189.70	\$30,936.50	\$23,097.90	\$9,698.20	\$18,130.10	\$28,762.60	\$24,240.20	\$43,356.10
Illinois	\$101,985.00	\$63,674.10	\$90,794.70	\$87,755.90	\$95,828.90	\$57,563.90	\$42,213.90	\$11,402.80	\$53,388.80	\$54,456.60	\$37,917.40	\$40,932.20
Massachusetts	\$38,797.60	\$27,822.70	\$25,975.20	\$24,839.00	\$28,984.50	\$17,079.20	\$10,994.50	\$1,071.00			\$4,581.70	\$58,673.30
New York	\$222,473.80	\$124,299.80	\$209,209.50	\$174,392.10	\$179,540.80	\$126,028.60	\$128,788.90	\$39,452.60	\$88,872.40	\$138,460.70	\$118,595.40	\$117,581.20
Texas	\$290,559.80	\$179,663.20	\$288,572.70	\$244,025.80	\$244,380.90	\$126,669.90	\$122,946.30	\$52,827.80	\$153,339.30	\$174,374.60	\$129,861.60	\$192,455.50
2005	2005											
	1	2	3	4	5	6	7	8	9	10	11	12
California	\$226,267.50	\$128,909.10	\$295,538.20	\$220,477.70	\$182,835.10	\$125,943.10	\$149,158.50	\$147,114.80	\$464,168.30	\$327,991.20	\$202,222.50	\$312,053.50

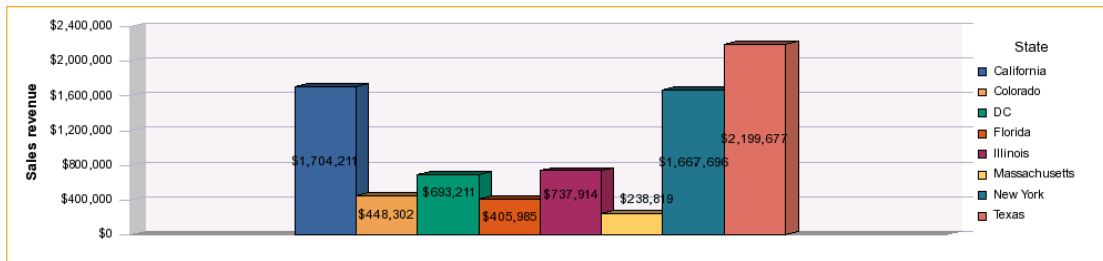
## Second Report

### Sales Analysis by Geography and Time

2004	1	2	3	4	5	6	7	8	9	10	11	12	Sum:
California	\$178,186	\$120,205	\$220,830	\$185,423	\$163,346	\$92,725	\$115,918	\$36,011	\$242,380	\$141,648	\$100,114	\$107,426	\$1,704,211
Colorado	\$41,687	\$35,181	\$54,929	\$55,378	\$43,661	\$30,037	\$33,140	\$9,012	\$43,469	\$38,581	\$27,833	\$35,394	\$448,302
DC	\$74,120	\$48,128	\$86,076	\$82,401	\$60,683	\$36,779	\$48,804	\$14,281	\$68,601	\$78,923	\$40,881	\$53,532	\$693,211
Florida	\$55,732	\$31,099	\$50,699	\$41,044	\$49,190	\$30,937	\$23,098	\$9,698	\$18,130	\$28,763	\$24,240	\$43,356	\$405,985
Illinois	\$101,985	\$63,674	\$90,795	\$87,756	\$95,829	\$57,564	\$42,214	\$11,403	\$53,389	\$54,457	\$37,917	\$40,932	\$737,914
Massachusetts	\$38,798	\$27,823	\$25,975	\$24,839	\$28,985	\$17,079	\$10,995	\$1,071		\$4,582	\$58,673		\$238,819
New York	\$222,474	\$124,300	\$209,210	\$174,392	\$179,541	\$126,029	\$128,789	\$39,453	\$88,872	\$138,461	\$118,595	\$117,581	\$1,667,696
Texas	\$290,560	\$179,663	\$288,573	\$244,026	\$244,381	\$126,670	\$122,946	\$52,828	\$153,339	\$174,375	\$129,862	\$192,456	\$2,199,677
Sum:	\$1,003,541	\$630,073	\$1,027,085	\$895,260	\$865,615	\$517,819	\$525,904	\$173,756	\$668,181	\$655,206	\$484,024	\$649,350	\$8,095,814

Following of the crosstab and chart in the annual section

Illinois	\$101,985	\$63,674	\$90,795	\$87,756	\$95,829	\$57,564	\$42,214	\$11,403	\$53,389	\$54,457	\$37,917	\$40,932	\$737,914
Massachusetts	\$38,798	\$27,823	\$25,975	\$24,839	\$28,985	\$17,079	\$10,995	\$1,071		\$4,582	\$58,673		\$238,819
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## Report 3 : Cover Page (to be in the first position of the document)

### Analyse multiple des ventes

1. Analyse mensuelle des ventes par tableau croisé
2. Analyse mensuelle des ventes par graphique

## Second Document : B02QuantityAnalysis.wid

### Query

Result Objects

 Year	 State	 Quantity sold
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### Report 1 : Quantity sold by Year and State

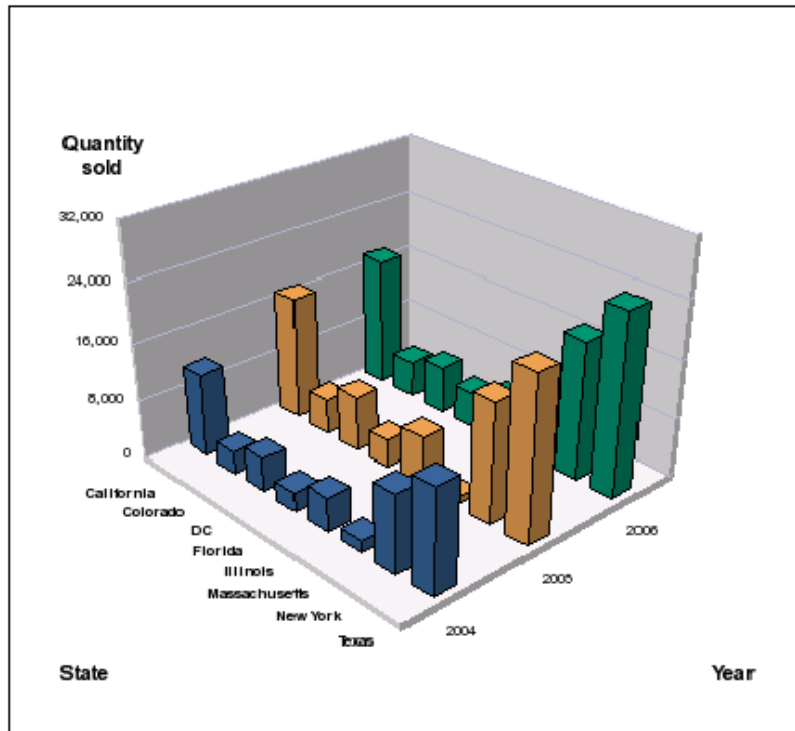
Quantity Sold by Year and State		
Year	State	Quantity sold
2004	California	11,304
	Colorado	2,971
	DC	4,681
	Florida	2,585
	Illinois	4,713
	Massachusetts	1,505
	New York	10,802
	Texas	14,517
2004	S/Total :	53,078

Year	State	Quantity sold
	California	17,001
	Colorado	4,700
	DC	7,572



## Report 2 : Chart of the sales quantity by 3D histogram

Quantity Sold by Year and State

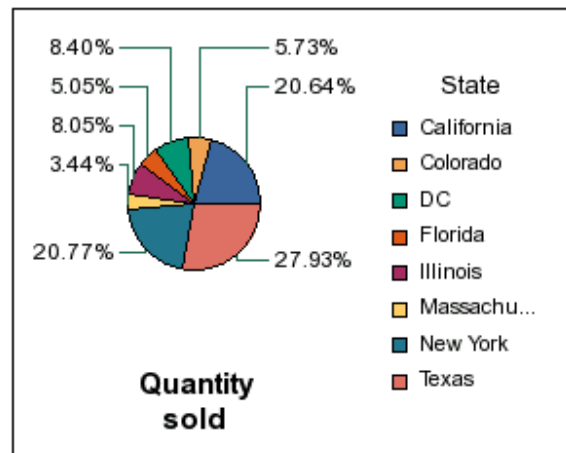


State	Quantity sold
California	46,074
Colorado	12,787
DC	18,744
Florida	11,267
Illinois	17,976
Massachusetts	7,676
New York	46,358
Texas	62,347

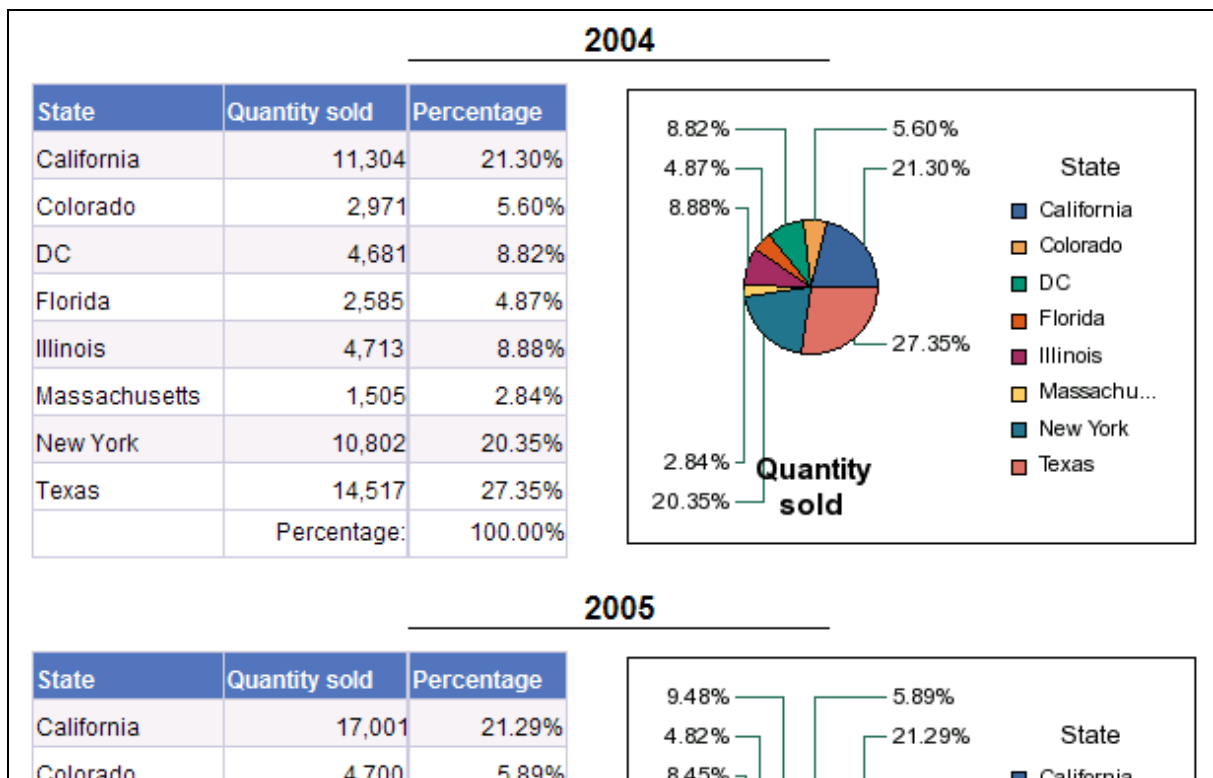
Year	Quantity sold
2004	53,078
2005	79,855
2006	90,296

## Report 3 : Table with percentage and Pie Chart

State	Quantity sold	Percentage
California	46,074	20.64%
Colorado	12,787	5.73%
DC	18,744	8.40%
Florida	11,267	5.05%
Illinois	17,976	8.05%
Massachusetts	7,676	3.44%
New York	46,358	20.77%
Texas	62,347	27.93%
	Percentage:	100.00%



Report 4 : same as the report 3, but by year



#### Enhancement filters using input controls

For each Web Intelligence document, you have to create report filters via the input controls.

### **3.4. Reporting with Excel**

Creating an Excel Dashboard, by using Pivot Tables (“tableaux croisés dynamiques”) and slicers (“segments”) in Excel 2010 by using a connection to the Analysis Services Cube.

### **3.5. Reporting with Qlikview**

Creating a Dashboard connecting to the SQL Server Emode Database (use only the five tables from the star model).