**Solution Development Plan**

Solution: NorthwindFoods

Owner: RRoot

Date: 08/15/12

Change Log

|  |  |  |
| --- | --- | --- |
| Who | When | What |
|  |  |  |
|  |  |  |

Summary

The Northwind Foods Company wants a BI Solution that will provide information to managers and employees about what products are being order by its customers. Currently reports have become more inaccurate and the solution must assist in solving that problem.

Expectations

1. The solution will store and present verified data.
2. The solution will allow for simple ad hoc queries.
3. The solution must include a data warehouse that is easy to use.
4. The solution should include an OLAP cube.
5. The solution should be simple to keep development and maintenance costs at a minimum.
6. A working prototype should be available in a short period of time.

OpenIssues

|  |  |  |
| --- | --- | --- |
| Who | When | What |
|  |  |  |
|  |  |  |

Closed Issues

|  |  |  |
| --- | --- | --- |
| Who | When | What |
|  |  |  |
|  |  |  |

# Solution Naming Conventions

ETL Staging Database (SQL Server)

|  |  |  |  |
| --- | --- | --- | --- |
| Object Type | Convention | Example | Description |
| Table | EtlTableName | EtlTimeTable | A table used to temporarily hold data for the ETL process |
| View | vEtlViewName | vEtlCastCustomerData | A saved select statement that provides ETL data |
| Stored Proc. | pEtlProcedureName | pEtlTransformCustomerNames | A set of saved statements that provides ETL data |
| Function | fEtlFunctionName | fEtlLookupValues | A saved select statement that provides ETL data |
| … |  |  |  |

Data Warehouse Database (SQL Server)

|  |  |  |  |
| --- | --- | --- | --- |
| Object Type | Convention | Example | Description |
| Fact Table | FactTableName | FactOrders | A table that holds measures and dimensional keys |
| Dimension Table | DimTableName | DimCustomers | A table that holds dimensional keys and descriptive dimensional attributes |
| View | vRptViewName | vRptOrdersByTitle | A saved select statement used for reporting |
| Stored Proc. | pRptProcedureName | pRptOrdersByTitle | A saved set of statements used for reporting |
| Function | fRptFunctionName | fRptOrdersByTitle | A saved select statement used for reporting |
| … |  |  |  |

ETL Processing Objects (Integration Services)

|  |  |  |  |
| --- | --- | --- | --- |
| Object Type | Convention | Example | Description |
| File Connection | NameOfFile | ZipCodeList | A SSIS File connection object |
| Database Connection | DatabaseName | Northwind | A SSIS DB connection object |
| Task | ObjectName ObjectType | Load DimCustomers Data Flow | A SSIS task object |
| Container | ObjectName ObjectType | Load FactTables Sequence Container | A SSIS container object |
| … |  |  |  |

OLAP Cube Database (Analysis Server)

|  |  |  |  |
| --- | --- | --- | --- |
| Object Type | Convention |  | Description |
| Data Source | NameOfDataWarehouse | DWNorthwind | A SSAS Data Source |
| D.S. View | NameOfConnectionNameOfSubject | DWNorthwindOrderFacts | A SSAS Data Source View |
| Dimension | DimNameOfSubject | DimCustomers | A SSAS Dimension |
| Cube | NameOfSubject | CubeOrdersFacts | A SSAS Cube |
| … |  |  |  |

Report Objects (Reporting Services)

|  |  |  |  |
| --- | --- | --- | --- |
| Object Type | Convention |  | Description |
| Shared Data Source | SharedObjectTypeNameOfSource | SharedDataSourceDWNorthwind | A DataSource that is shared between reports |
| Local Data Source | ObjectTypeNameOfSource | DataSourceDWNorthwind | A DataSource that is part on a individual report |
| Shared Data Set | SharedObjectTypeNameOfSubject | ShareDataSetOrdersByCustomers | A DataSet that is shared between reports |
| Local DataSet | ObjectTypeNameOfSource | DataSetOrdersByCustomers | A DataSet that is part on a individual report |
| Report Component | ObjectTypeNameOfSubject | TableOrderssByCustomers | A SSRS Report Component |
| … |  |  |  |

# *Original Source Objects*

***Data Files***

***OLTP Database Tables***

***Table Name: Customers***

*Description: Contains customer data*

*Columns*

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Used in this version |
| CustomerID | nchar(5) | ALFKI | Yes |
| CompanyName | nvarchar(40) | Alfreds Futterkiste | Yes |
| ContactName | nvarchar(30) | Maria Anders | No |
| ContactTitle | nvarchar(30) | Sales Representative | No |
| Address | nvarchar(60) | Obere Str. 57 | No |
| City | nvarchar(15) | Berlin | Yes |
| Region | nvarchar(15) | NULL | Yes |
| PostalCode | nvarchar(10) | 12209 | No |
| Country | nvarchar(15) | Germany | Yes |
| Phone | nvarchar(24) | 030-0074321 | No |
| Fax | nvarchar(24) | 030-0076545 | No |

*Constraints*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| CustomerID | Yes | No | Yes | No | Yes | Yes |
| CompanyName | No | No | Yes | No | No | No |
| ContactName | No | No | No | No | No | No |
| ContactTitle | No | No | No | No | No | No |
| Address | No | No | No | No | No | No |
| City | No | No | No | No | No | No |
| Region | No | No | No | No | No | No |
| PostalCode | No | No | No | No | No | No |
| Country | No | No | No | No | No | No |
| Phone | No | No | No | No | No | No |
| Fax | No | No | No | No | No | No |

***Table Name:Employees***

*Description: Contains employee data*

*Columns*

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Used in this version |
| EmployeeID | int | 1 | Yes |
| LastName | nvarchar(20) | Davolio | Yes |
| FirstName | nvarchar(10) | Nancy | Yes |
| Title | nvarchar(30) | Sales Representative | No |
| TitleOfCourtesy | nvarchar(25) | Ms. | No |
| BirthDate | datetime | 1948-12-08 00:00:00.000 | No |
| HireDate | datetime | 1992-05-01 00:00:00.000 | No |
| Address | nvarchar(60) | 507 - 20th Ave. E. Apt. 2A | No |
| City | nvarchar(15) | Seattle | No |
| Region | nvarchar(15) | WA | No |
| PostalCode | nvarchar(10) | 98122 | No |
| Country | nvarchar(15) | USA | No |
| HomePhone | nvarchar(24) | (206) 555-9857 | No |
| Extension | nvarchar(4) | 5467 | No |
| Photo | image(2147483647) | 0x151C2F0 | No |
| Notes | ntext(1073741823) | Education includes a | No |
| ReportsTo | int | 2 | No |
| PhotoPath | nvarchar(255) | http://accweb/emmployees/davolio.bmp | No |

*Constraints*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| EmployeeID | Yes | No | Yes | No | Yes | Yes |
| LastName | No | No | Yes | No | No | No |
| FirstName | No | No | Yes | No | No | No |
| Title | No | No | No | Yes | No | No |
| TitleOfCourtesy | No | No | No | No | No | No |
| BirthDate | No | No | No | No | No | No |
| HireDate | No | No | No | No | No | No |
| Address | No | No | No | No | No | No |
| City | No | No | No | No | No | No |
| Region | No | No | No | No | No | No |
| PostalCode | No | No | No | No | No | No |
| Country | No | No | No | No | No | No |
| HomePhone | No | No | No | No | No | No |
| Extension | No | No | No | No | No | No |
| Photo | No | No | No | No | No | No |
| Notes | No | No | No | No | No | No |
| ReportsTo | No | Yes | No | No | No | No |
| PhotoPath | No | No | No | No | No | No |

***Table Name: Orders***

*Description: Contains Order data*

*Columns*

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Used in this version |
| OrderID | int | 10248 | Yes |
| CustomerID | nchar(5) | VINET | Yes |
| EmployeeID | int | 5 | Yes |
| OrderDate | datetime | 1996-07-04 00:00:00.000 | Yes |
| RequiredDate | datetime | 1996-08-01 00:00:00.000 | Yes |
| ShippedDate | datetime | 1996-07-16 00:00:00.000 | Yes |
| ShipVia | int | 3 | No |
| Freight | money | 32.38 | No |
| ShipName | nvarchar(40) | Vins et alcools Chevalier | No |
| ShipAddress | nvarchar(60) | 59 rue de l'Abbaye | No |
| ShipCity | nvarchar(15) | Reims | No |
| ShipRegion | nvarchar(15) | Demo | No |
| ShipPostalCode | nvarchar(10) | 51100 | No |
| ShipCountry | nvarchar(15) | France | No |

*Constraints*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| OrderID | Yes | No | Yes | No | Yes | Yes |
| CustomerID | No | No | No | No | No | No |
| EmployeeID | No | No | No | No | No | No |
| OrderDate | No | No | No | Yes | No | No |
| RequiredDate | No | No | No | No | No | No |
| ShippedDate | No | No | No | No | No | No |
| ShipVia | No | No | No | No | No | No |
| Freight | No | No | No | No | No | Yes |
| ShipName | No | No | No | No | No | No |
| ShipAddress | No | No | No | No | No | No |
| ShipCity | No | No | No | No | No | No |
| ShipRegion | No | No | No | No | No | No |
| ShipPostalCode | No | No | No | No | No | No |
| ShipCountry | No | No | No | No | No | No |

***Table Name: Order Details***

*Description: Contains data about each line items for an order*

*Columns*

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Used in this version |
| OrderID | int | 10248 | Yes |
| ProductID | int | 11 | Yes |
| UnitPrice | money | 14.00 | Yes |
| Quantity | smallint | 12 | Yes |
| Discount | real | 0 | No |

*Constraints*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| OrderID | Yes | Yes | Yes | No | No | No |
| ProductID | Yes | Yes | Yes | No | No | No |
| UnitPrice | No | No | Yes | Yes | No | No |
| Quantity | No | No | Yes | Yes | No | No |
| Discount | No | No | Yes | Yes | No | No |

***Table Name: Products***

*Description: Contains data products*

*Columns*

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Used in this version |
| ProductID | int | 1 | Yes |
| ProductName | nvarchar(40) | Chai | Yes |
| SupplierID | int | 1 | No |
| CategoryID | int | 1 | No |
| QuantityPerUnit | nvarchar(20) | 10 boxes x 20 bags | No |
| UnitPrice | money | 18.00 | Yes |
| UnitsInStock | smallint | 39 | No |
| UnitsOnOrder | smallint | 0 | No |
| ReorderLevel | smallint | 10 | No |
| Discontinued | bit | 0 | Yes |

*Constraints*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| ProductID | Yes | Yes | Yes | No | No | Yes |
| ProductName | No | No | Yes | No | No | No |
| SupplierID | No | No | No | No | No | No |
| CategoryID | No | No | No | No | No | No |
| QuantityPerUnit | No | No | No | No | No | No |
| UnitPrice | No | No | No | Yes | No | Yes |
| UnitsInStock | No | No | No | Yes | No | Yes |
| UnitsOnOrder | No | No | No | Yes | No | Yes |
| ReorderLevel | No | No | No | Yes | No | Yes |
| Discontinued | No | No | Yes | No | No | Yes |

***Table Name: Categories***

*Description: Contains data product categories*

*Columns*

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Used in this version |
| CategoryID | int | 1 | Yes |
| CategoryName | nvarchar(15) | Beverages | Yes |
| Description | ntext(1073741823) | Soft drinks, coffees, teas, beers, and ales | No |
| Picture | image(2147483647) | Binary Data | No |

*Constraints*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| CategoryID | Yes | Yes | Yes | No | No | Yes |
| CategoryName | No | No | Yes | No | No | No |
| Description | No | No | No | No | No | No |
| Picture | No | No | No | No | No | No |

# Data Warehouse Objects

Data Warehouse Tables

Table Name: FactOrders

Description: Contains information about orders by customers, products, employees, and dates.

Columns

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | Data Type | Example | Max Value | Min Value | Invalid Examples |
| OrderId | Int | 1 | Int Max | > 0 | 0, -1, A |
| CustomerKey | Int | 1 | Int Max | Int Min | A |
| EmployeeKey | Int | 1 | Int Max | Int Min | A |
| ProductKey | Int | 1 | Int Max | Int Min | A |
| OrderDateKey | Int | 1 | Int Max | Int Min | A |
| RequiredDateKey | Int | 1 | Int Max | Int Min | A |
| ShippedDateKey | Int | 1 | Int Max | Int Min | A |
| OrderQuantity | Int | 1 | Int Max | > 0 | 0, -1, A |
| OrderPrice | Decimal(18,4) | 1.200 | Decimal Max | > 0 | 0, -1, A |

Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| OrderId | Yes | No | Yes | > 0 | No | No |
| CustomerKey | Yes | Yes | Yes | No | No | No |
| EmployeeKey | Yes | Yes | Yes | No | No | No |
| ProductKey | Yes | Yes | Yes | No | No | No |
| OrderDateKey | Yes | Yes | Yes | No | No | No |
| RequiredDateKey | Yes | Yes | Yes | No | No | No |
| ShippedDateKey | Yes | Yes | Yes | No | No | No |
| OrderQuantity | No | No | Yes | > 0 | No | No |
| OrderPrice | No | No | Yes | > 0 | No | No |

Table Name: DimCustomers

Description: Contains information about customers.

Columns

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | Data Type | Example | Max Value | Min Value | Invalid Examples |
| CustomerKey | Int | 1 | Int Max | Int Min | A |
| CustomerId | nVarChar(5) | TESTC | Max nChar | Min nChar | More than 5 char. |
| CustomerName | nVarChar(100) | TestCo | Max nChar | Min nChar | More than 100 char. |
| CustomerCity | nVarChar(50) | Seattle | Max nChar | Min nChar | More than 50 char. |
| CustomerRegion | nVarChar(50) | Washington | Max nChar | Min nChar | More than 50 char. |
| CustomerCountry | nVarChar(50) | USA | Max nChar | Min nChar | More than 50 char. |

Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| CustomerKey | Yes | No | Yes | No | Yes | No |
| CustomerId | No | No | Yes | No | No | No |
| CustomerName | No | No | Yes | No | No | No |
| CustomerCity | No | No | Yes | No | No | No |
| CustomerRegion | No | No | Yes | No | No | No |
| CustomerCountry | No | No | Yes | No | No | No |

Table Name: DimProducts

Description: Contains information about products.

Columns

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | Data Type | Example | Max Value | Min Value | Invalid Examples |
| ProductKey | Int | 1 | Int Max | Int Min | A |
| ProductId | Int | 1 | Max nChar | Min nChar | More than 5 char. |
| ProductName | nVarChar(100) | TestProd | Max nChar | Min nChar | More than 100 char. |
| ProductCategoryName | nVarChar(100) | Food | Max nChar | Min nChar | More than 50 char. |
| ProductStdPrice | Decimal(18,4) | 1.200 | Max nChar | Min nChar | More than 50 char. |
| ProductIsDiscontinued | nChar(1) | T,F | T | F | Y, n, More than 1 char. |

Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| ProductKey | Yes | No | Yes | No | Yes | No |
| ProductId | No | No | Yes | No | No | No |
| ProductName | No | No | Yes | No | No | No |
| ProductCategoryName | No | No | Yes | No | No | No |
| ProductStdPrice | No | No | Yes | No | No | No |
| ProductIsDiscontinued | No | No | Yes | In ('T','F') | No | No |

Table Name: DimEmployees

Description: Contains information about employees.

Columns

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | Data Type | Example | Max Value | Min Value | Invalid Examples |
| EmployeeKey | Int | 1 | Int Max | Int Min | A |
| EmployeeId | Int | 1 | Int Max | Int Min | A |
| EmployeeName | nVarChar(100) | TestEmp | Max nChar | Min nChar | More than 100 char. |
| ManagerKey | Int | 1 | Int Max | Int Min | A |
| ManagerId | Int | 1 | Int Max | Int Min | A |

Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| EmployeeKey | Yes | No | Yes | No | Yes | No |
| EmployeeId | No | No | Yes | No | No | No |
| EmployeeName | No | No | Yes | No | No | No |
| ManagerKey | No | Yes | Yes | No | No | No |
| ManagerId | No | Yes | Yes | No | No | No |

Table Name: DimDates

Description: Contains information about Dates.

Columns

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | Data Type | Example | Max Value | Min Value | Invalid Examples |
| DateKey | Int | 19900101 | 19901231 | 19900101 | A |
| FullDate | datetime | 1990-01-01 | 1990-12-31 | 1990-01-01 | A, |
| DateName | nVarChar(50) | January, 1, 1990 | December, 31, 1999 | January,1,1990 | Not a date |
| MonthKey | Int | 199001 | 199912 | 199001 | A, < 1, > 12 |
| MonthName | nVarChar(50) | January | December | January | Not a Month |
| QuarterKey | Int | 19901 | 19904 | 19901 | A, < 1, > 4 |
| QuarterName | nVarChar(50) | Q1 | Q4 | Q1 | Not a Quarter |
| YearKey | Int | 1990 | 1999 | 1990 | A, < 1990, > 1999 |
| YearName | nVarChar(50) | 1990 | 1999 | 1990 | Not a Year |

Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| DateKey | Yes | No | Yes | No | Yes | No |
| FullDate | No | No | Yes | No | No | No |
| DateName | No | No | Yes | No | No | No |
| MonthKey | No | No | Yes | No | No | No |
| MonthName | No | No | Yes | No | No | No |
| QuarterKey | No | No | Yes | No | No | No |
| QuarterName | No | No | Yes | No | No | No |
| YearKey | No | No | Yes | No | No | No |
| YearName | No | No | Yes | No | No | No |

Data Warehouse Views

None required

Data Warehouse Stored Procedures

None required

Data Warehouse Functions

None required

# ETL Staging Objects

This is a list of all the known ETL staging objects (tables, views, stored procedures, or functions)

ETL Staging Database Tables

None required

ETL Staging Database Views

None required

ETL Staging Database Stored Procedures

None required

ETL Staging Database Functions

None required

# ETL SSIS Objects

This is a list of all the known ETL SSIS objects

ETL SSIS Projects

ProjectName:

Description:

ETL SSIS Packages

Package Name:

Description:

Connections

|  |  |  |
| --- | --- | --- |
| Connection Name | Type | Connection String |
|  |  |  |
|  |  |  |

Containers

|  |  |  |
| --- | --- | --- |
| Container Name | Type | Description |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Tasks

|  |  |  |
| --- | --- | --- |
| Task Name | Type | Description |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# OLAP Cubes Database Objects

OLAP Cubes

Cube Name:

Description:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Measure Name | Data Type | Example | Max Value | Min Value | Description |

|  |  |
| --- | --- |
| Dimension | Dimension Key |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

OLAP Dimensions

Dimension Name:

Description:

Type:

Source:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Data Type | Example | Max Value | Min Value | Description |
|  |  |  |  |  |  |

Dimension Name:

Description:

Type:

Source:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Data Type | Example | Max Value | Min Value | Description |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

*Reporting Objects*

***Excel Reports***

*Description:*

*Type:*

*Source:*

|  |  |  |
| --- | --- | --- |
| Field | Example | Description |
|  |  |  |
|  |  |  |

***Reporting Server Reports***

*Description:*

*Type:*

*Source:*

|  |  |  |
| --- | --- | --- |
| Field | Example | Description |
|  |  |  |
|  |  |  |