

# Design Your Databases Using Oracle SQL Developer Data Modeler

ITOUG Tech Day Milano

30.1.2019

# Introduction, Heli

- \* Graduated from University of Helsinki (Master of Science, computer science), currently a doctoral student, researcher and lecturer (databases, Big Data, Multi-model Databases, methods and tools for utilizing semi-structured data for decision making) at University of Helsinki
- \* Worked with Oracle products since 1993, worked for IT since 1990
- \* Data and Database!
- \* CEO for Miracle Finland Oy
- \* Oracle ACE Director
- \* Ambassador/EOUC (EMEA Oracle Users Group Community)
- \* Public speaker and an author
- \* Winner of Devvy for Database Design Category, 2015
- \* Author of the book Oracle SQL Developer Data Modeler for Database Design Mastery (Oracle Press, 2015), co-author for Real World SQL and PL/SQL: Advice from the Experts (Oracle Press, 2016)



ORACLE

# Oracle SQL Developer Data Modeler for Database Design Mastery

Design, Deploy, and Maintain World-Class Databases  
on Any Platform

**Heli Helskyaho**  
Oracle ACE Director

Forewords by C.J. Date and Tom Kyte



Oracle  
Press



ORACLE

# Real World SQL & PL/SQL

Advice from the Experts

Arup Nanda  
Brendan Tierney  
Heli Helskyaho  
Martin Widlake  
Alex Nuijten



Oracle  
Press

# Introduction, Heli

- \* Been an Oracle Designer user since 1996 and Data Modeler user since 2010
- \* Been solving performance problems since 1993
  - \* Absolutely convinced that good database *design* and *documentation* will *reduce* this work.
  - \* Absolutely convinced that it is *easier* to solve problems on database that has been *documented*

# What is database design?

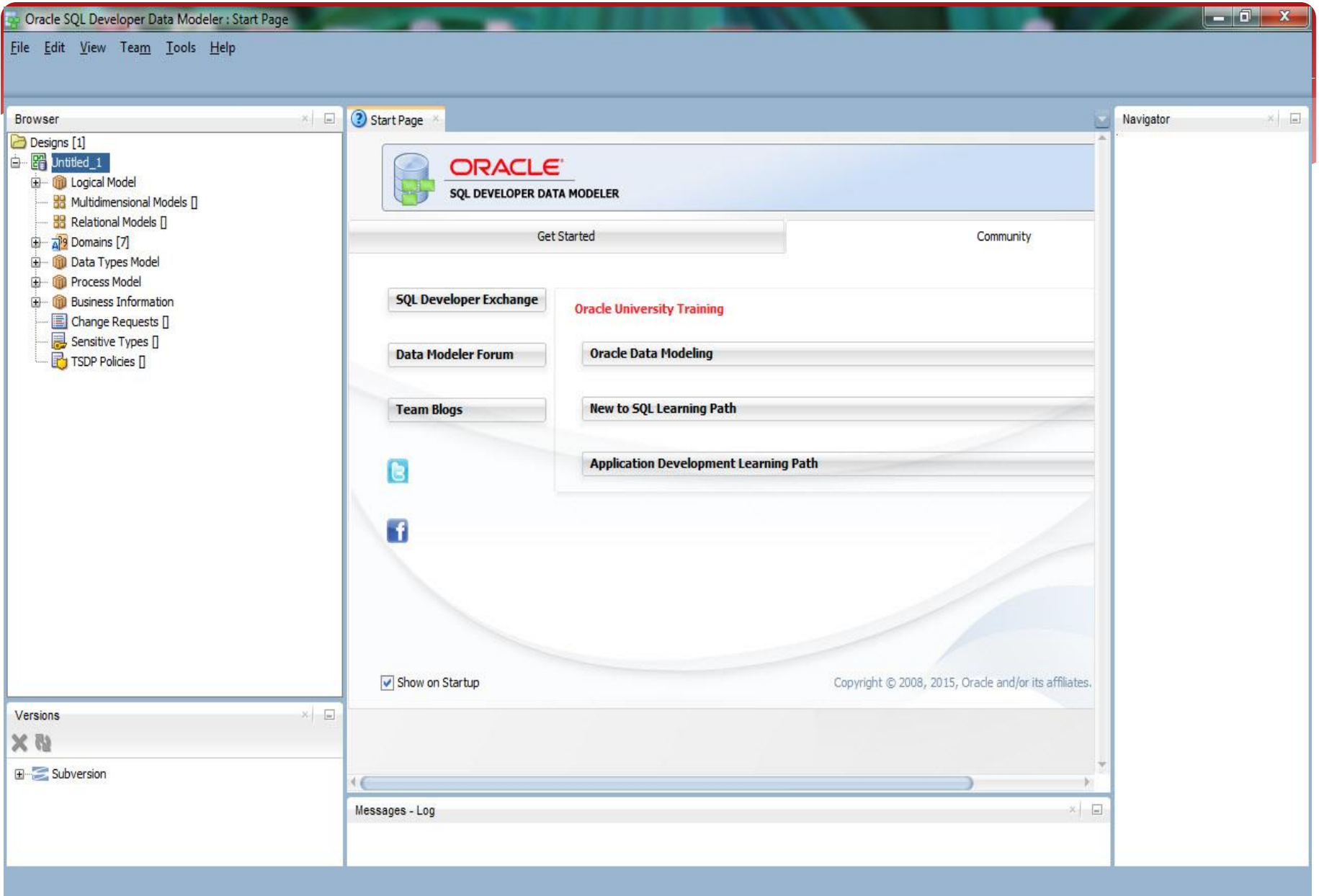
- \* 4 (5) phases, over and over again
  - \* Requirement analysis (DM: logical)
  - \* Conceptual design (DM: logical)
  - \* Logical design (DM: relational)
  - \* Physical design (DM: physical)
  - \* (Transaction design) (DM: process)

# What is Data Modeler?

- \* A tool for database design (supports all the "new" Oracle features)
- \* Logical, relational, physical models, DDLs,...
- \* Multidimensional models (DW), Data Flows etc.
- \* For **designing** and **documenting** the **data architecture** and the **database**
- \* Support for all the phases in database design and easy moving from one to another, support for reverse engineering
- \* Support for version control and multiuser environment: XML files and Subversion

# What is Data Modeler?

- \* Import: Oracle repository, existing databases, Oracle Designer, file import (Erwin, Bachman), ...
- \* Export: DDL, CSV, ...
- \* Reporting (in tool itself and also Reporting Repository)
- \* Standards: Design Rules, Preferences, Naming Standards, Domains, ...
- \* Data Modeler viewer integrated in SQL Developer (3.0 ->), also reports





# Logical model

Oracle SQL Developer Data Modeler

File Edit View Versioning Tools Help

New Entity

Start Page x Logical (Orderdb) x

Designs [1]  
 Orderdb  
 Logical Model  
 Multidimensional Models []  
 Relational Models [1]  
 Domains [1]  
 Data Types Model  
 Process Model  
 Business Information  
 Change Requests []

Versioning Navigator x  
 Subversion

Navigator

```

    erDiagram
      ORDER ||--o{ CUSTOMER : "has"
      ORDER ||--o{ ORDERLINE : "has"
      ORDERLINE ||--o{ PRODUCT : "has"
  
```

ORDER  
 # \* OrderNo  
 o OrderDate

CUSTOMER  
 # \* CustomerNo  
 o Name  
 o DeliveryAddress  
 o MailAddress

ORDERLINE  
 # \* OrderlineNo  
 o Pcs  
 o Price

PRODUCT  
 # \* ProductNo  
 \* ProductName

Logical

SVN Console - Log x Pending Changes x

```

propset svn:ignore "*.localz" " C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/logical/relation
propset svn:ignore "*.localz +.local" " C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/logical/relation
propset svn:ignore "*.localz" " C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/logical/relation/seg_0
propset svn:ignore "*.localz +.local" " C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/logical/relation/seg_0
  
```

Messages SVN Console x

Subversion

Editing

# Entity

**Entity Properties - Order** [X]

General

- Attributes
- Unique Identifiers
- Relationships
- Volume Properties
- Engineer To
- Comments
- Comments in RDBMS
- Notes
- Impact Analysis
- Measurements
- Change Requests
- Responsible Parties
- Documents
- Dynamic Properties
- Summary

General

Name:

Short Name:

Synonyms:

Synonym to display:

Preferred Abbreviation:

Long Name:

Forward Engineer Strategy:

Based on Structured Type:

Super Type:

Source:

Classification Type:

Scope:

Allow Type Substitution:

OK Apply Naming Rules Cancel Help

- General
- Attributes**
- Unique Identifiers
- Relationships
- Volume Properties
- Engineer To
- Comments
- Comments in RDBMS
- Overlapping Attributes
- Notes
- Impact Analysis
- Measurements
- Change Requests
- Responsible Parties
- Documents
- Dynamic Properties
- Summary

Attributes

Details Overview

Attributes:

✎ + ✖ ↑ ↓ 📄 📋

	Name	Data type
1	OrderNo	NUMERIC
2	OrderDate	Date

Attribute Properties

Name:

Datatype:  Domain  Logical  Distinct  
 Structured  Collection

Type:  Preferred

Primary UID  Relation UID  Mandatory

Comments Comments in RDBMS Notes

**Entity Properties - Order** [X]

- General
- Attributes
- Unique Identifiers**
- Relationships
- Volume Properties
- Engineer To
- Comments
- Comments in RDBMS
- Notes
- Impact Analysis
- Measurements
- Change Requests
- Responsible Parties
- Documents
- Dynamic Properties
- Summary

Unique Identifiers

XY? | + X



Name	PUID
Order PK	<input checked="" type="checkbox"/>

OK Apply Naming Rules Cancel Help

**Entity Properties - Order** [X]

General  
Attributes  
Unique Identifiers  
**Relationships**  
Volume Properties  
Engineer To  
Comments  
Comments in RDBMS  
Notes  
Impact Analysis  
Measurements  
Change Requests  
Responsible Parties  
Documents  
Dynamic Properties  
Summary

Relationships

Name
Relation_1
Relation_7

OK Apply Naming Rules Cancel Help

# Relationship



**Relation Properties - Relation\_4** [X]

**General**

Name:

Long Name:

<b>Source Cardinality</b>		<b>Target Cardinality</b>	
Source:	<input type="text" value="Order"/>	Target:	<input type="text" value="OrderLine"/>
Name on Source:	<input type="text"/>	Name on Target:	<input type="text"/>
Source Entity Synonym:	<input type="text" value="Order"/>	Target Entity Synonym:	<input type="text" value="OrderLine"/>
Source to Target Cardinality:	<input type="text" value="*"/>	Target to Source Cardinality:	<input type="text" value="1"/>
Source Optional:	<input checked="" type="checkbox"/>	Target Optional:	<input type="checkbox"/>

Dominant Role:

Identifying:

Delete Rule:

OK    Apply    Cancel    Help

**Relation Properties - Relation\_4** [X]

General  
Engineer To  
Comments  
Comments in RDBMS  
Notes  
Attributes  
Impact Analysis  
Measurements  
Change Requests  
Responsible Parties  
Documents  
Dynamic Properties  
**Summary**

Summary

Object ID:	335E66D1-384E-C159-7406-4B1707E91E7F
Creator:	helskyaho_h
Creation Time:	2012-09-17 10:04:52 EEST
Last Changed By:	helskyaho_h
Last Changed Time:	2012-09-17 10:05:11 EEST
Generator Name:	NONE
Design:	Orderdb
Repository OID:	NONE

[OK] [Apply] [Cancel] [Help]

# From logical to relational

Oracle SQL Developer Data Modeler

File Edit View Versioning Tools Help

Browser x Engineer to Relational Model ge x Logical (Orderdb) x

Logical Model

- Entities [4]
  - Customer
  - Order
  - OrderLine
  - Product
- Relations [3]
  - Relation\_2 (Customer - 0..\*:1..1 - Order)
  - Relation\_4 (Order - 0..\*:1..1 - OrderLine)
  - Relation\_6 (Product - 0..\*:1..1 - OrderLine)
- Inheritances []
- Views []
- SubViews []
- Displays []
- Multidimensional Models []
- Relational Models [1]
  - Relational\_1
    - Tables []
    - Views []
    - Foreign Keys []
    - Schemas []
    - SubViews []
    - Physical Models []
    - Displays []
- Domains [1]

Versioning Navigator x

- Subversion

```

    erDiagram
        ORDER ||--o{ CUSTOMER : ""
        ORDER ||--o{ ORDERLINE : ""
        ORDERLINE ||--o{ PRODUCT : ""
        ORDER {
            string OrderNo PK
            string OrderDate
        }
        ORDERLINE {
            string OrderlineNo PK
            int Pcs
            float Price
        }
        CUSTOMER {
            string CustomerNo PK
            string Name
            string DeliveryAddress
            string MailAddress
        }
        PRODUCT {
            string ProductNo PK
            string ProductName
        }
  
```

Logical

SVN Console - Log x Pending Changes x

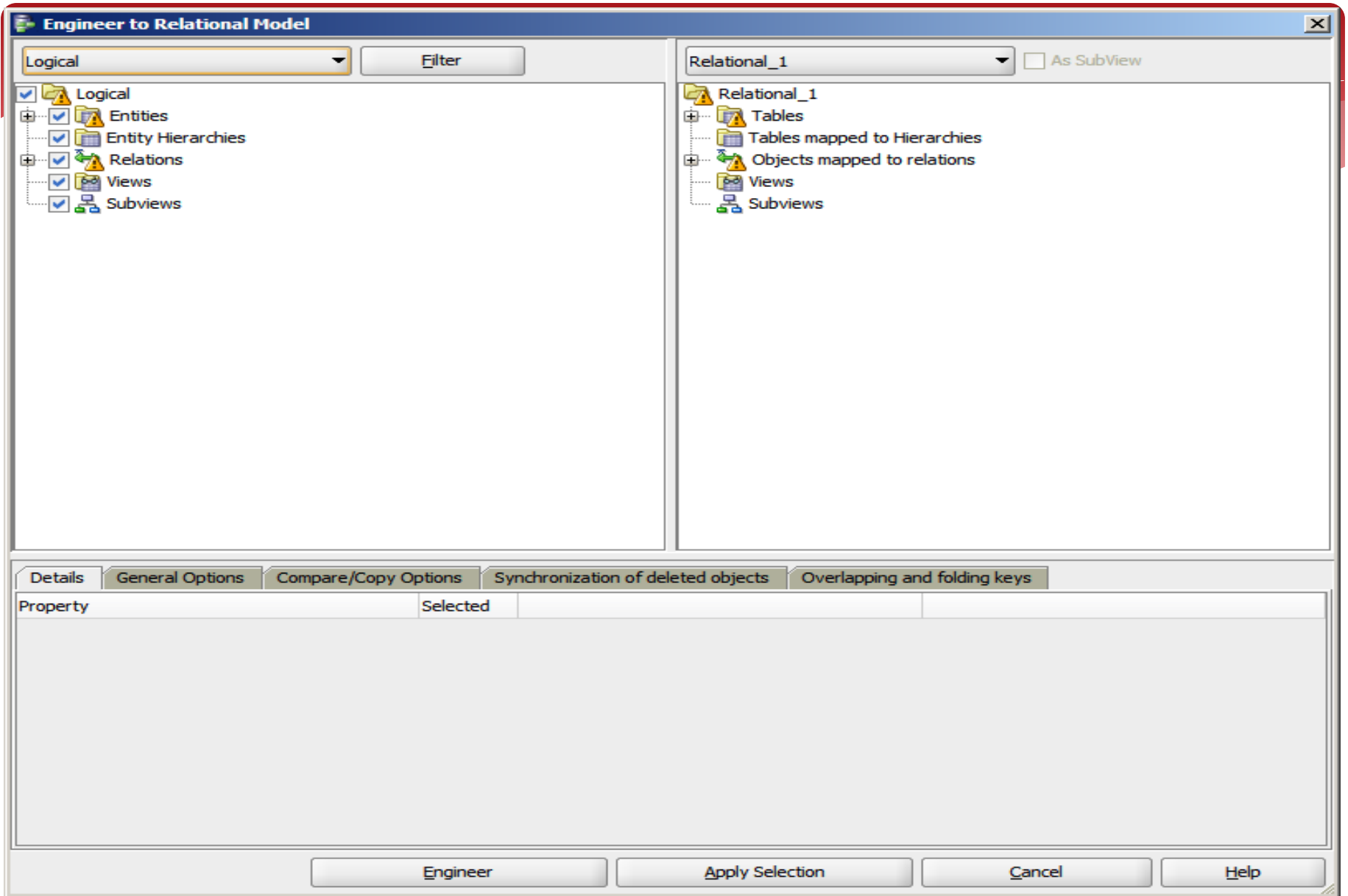
```

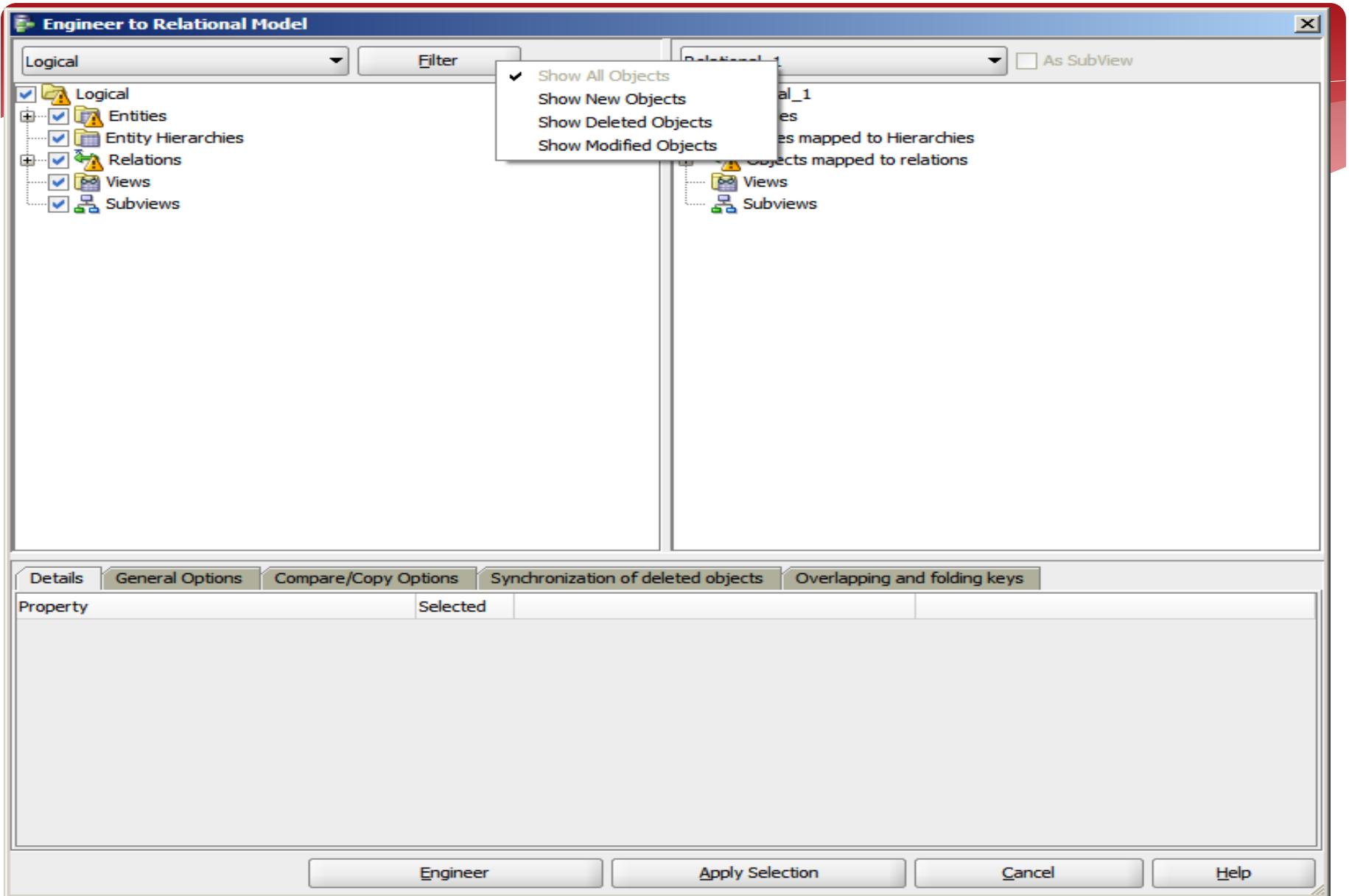
propset svn:ignore "*.localz" "C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/logical/relation
propset svn:ignore "*.localz *.local" "C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/logical/relation
propset svn:ignore "*.localz" "C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/logical/relation/seg_0
propset svn:ignore "*.localz *.local" "C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/logical/relation/seg_0
  
```

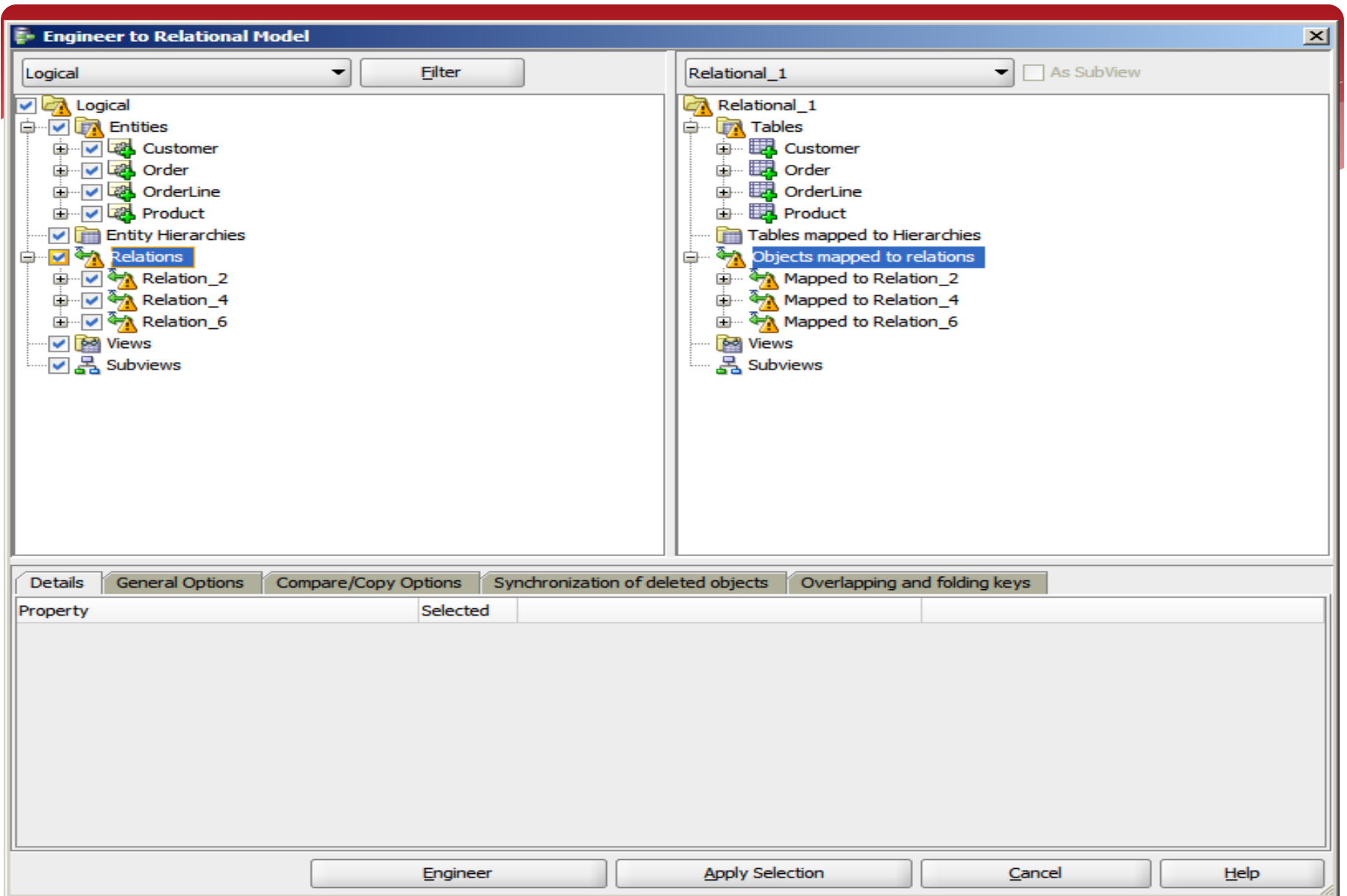
Messages SVN Console x

Subversion

Editing







**Engineer to Relational Model**

Logical Filter Relational\_1  As SubView

**Logical**

- Entities
  - Customer
    - Attributes
      - CustomerNo
      - Name
      - DeliveryAddress
      - MailAddress
      - ContactPerson
    - Candidate Keys
  - Order
  - OrderLine
  - Product
- Entity Hierarchies
- Relations
- Views
- Subviews

**Relational\_1**

- Tables
  - Customer
    - Columns
      - CustomerNo
      - Name
      - DeliveryAddress
      - MailAddress
      - ContactPerson
    - PK and UK Constraints
  - Order
  - OrderLine
  - Product
- Tables mapped to Hierarchies
- Objects mapped to relations
- Views
- Subviews

**Details** | General Options | Compare/Copy Options | Synchronization of deleted objects | Overlapping and folding keys

Property	Selected	Customer.ContactPerson	Customer.ContactPerson
Name	<input type="checkbox"/>	ContactPerson	ContactPerson
Data Type	<input type="checkbox"/>	VARCHAR2 (100)	VARCHAR2 (100)
Data Type Kind	<input type="checkbox"/>	Logical Type(VARCHAR)	Logical Type(VARCHAR)
Mandatory	<input type="checkbox"/>	false	false
Default Value	<input type="checkbox"/>		
Check Constraint Name	<input type="checkbox"/>		
Use Domain Constraint	<input type="checkbox"/>	false	false
Check Constraint	<input type="checkbox"/>		
Range Constraint	<input type="checkbox"/>		
LOV Constraint	<input type="checkbox"/>		
Comment	<input checked="" type="checkbox"/>	Testing	
Comment in RDBMS	<input type="checkbox"/>		
Notes	<input type="checkbox"/>		
Source Type	<input type="checkbox"/>		
Formula Description	<input type="checkbox"/>		
Type Substitution	<input type="checkbox"/>	true	true
Scope	<input type="checkbox"/>		

Engineer Apply Selection Cancel Help



**Engineer to Relational Model**

Logical

Relational\_1  As SubView

Logical

- Entities
  - Customer
    - Attributes
      - CustomerNo
      - Name
      - DeliveryAddress
      - MailAddress
      - ContactPerson
    - Candidate Keys
  - Order
  - OrderLine
  - Product
- Entity Hierarchies
- Relations
- Views
- Subviews

Relational\_1

- Tables
  - Customer
    - Columns
      - CustomerNo
      - Name
      - DeliveryAddress
      - MailAddress
      - ContactPerson
    - PK and UK Constraints
  - Order
  - OrderLine
  - Product
- Tables mapped to Hierarchies
- Objects mapped to relations
- Views
- Subviews

Details    General Options    Compare/Copy Options    Synchronization of deleted objects    Overlapping and folding keys

Entity - Table	Selected	Property	
Attribute - Column	<input checked="" type="checkbox"/>	Name	<input checked="" type="checkbox"/>
Unique Identifier - Index	<input checked="" type="checkbox"/>	Data Type	<input checked="" type="checkbox"/>
Relation - Foreign key	<input checked="" type="checkbox"/>	Data Type Kind	<input checked="" type="checkbox"/>
Entity View - View	<input checked="" type="checkbox"/>	Mandatory	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	Default Value	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	Check Constraint Name	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	Use Domain Constraint	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	Check Constraint	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	Range Constraint	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	LOV Constraint	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	Comment	<input type="checkbox"/>

Show Selected Properties Only  
 Don't apply for new objects  
 Exclude unchecked objects from tree

**Engineer to Relational Model**

Logical  Relational\_1  As SubView

Logical

- [-] Logical
  - [-] Entities
    - [-] Customer
    - [-] Order
    - [-] OrderLine
    - [-] Product
    - [-] test
  - [-] Entity Hierarchies
  - [-] Relations
  - [-] Views
  - [-] Subviews

Relational\_1

- [-] Relational\_1
  - [-] Tables
    - [-] Customer
    - [-] Order
    - [-] OrderLine
    - [-] Product
    - [-] test
  - [-] Tables mapped to Hierarchies
  - [-] Objects mapped to relations
  - [-] Views
  - [-] Subviews

Select	Deleted	To be deleted
<input type="checkbox"/>	test	test

Oracle SQL Developer Data Modeler : Relational\_1 (Orderdb)

File Edit View Versigning Tools Help

Engineer to Logical Model x Logical (Orderdb) x Relational\_1 (Orderdb) x

Designs [1]  
Orderdb  
Logical Model  
Entities [4]  
Customer  
Order  
OrderLine  
Product  
Relations [3]  
Inheriances []  
Views []  
SubViews []  
Displays []  
Multidimensional Models []  
Relational Models [1]  
Domains [3]  
Data Types Model  
Process Model  
Business Information  
Change Requests []

```

    erDiagram
        Order ||--o{ Customer : "has"
        Order ||--o{ OrderLine : "has"
        OrderLine ||--o{ Product : "has"
        Order }|--o{ Customer : "FK"
        OrderLine }|--o{ Product : "FK"
    
```

Order

P *	OrderNo	NUMBER
	OrderDate	DATE
F *	CustomerNo	NUMBER
PK	Order_PK (OrderNo)	

Customer

P *	CustomerNo	NUMBER
	Name	VARCHAR
	DeliveryAddress	VARCHAR
	MailAddress	VARCHAR
	ContactPerson	VARCHAR
PK	Customer_PK (CustomerNo)	

OrderLine

P *	OrderlineNo	NUMBER (10)
	Pos	NUMBER
	Price	NUMBER (15..)
PF *	OrderNo	NUMBER
F *	ProductNo	NUMBER (10)

Product

P *	ProductNo	NUMBER (10)
	ProductName	VARCHAR2
PK	Product_PK (ProductNo)	

Versioning Navigator x

Subversion

Messages - Log x Pending Changes x

```

2012-09-27 13:46:09 - Open Design: 'Orderdb'
2012-09-27 13:46:10 - Open Design: 'OK'
2012-09-27 13:49:16 - Forward Engineering
2012-09-27 13:55:02 - Create Entity
2012-09-27 13:55:10 - Forward Engineering
2012-09-27 13:55:16 - Delete Entity: test
2012-09-27 13:59:24 - Forward Engineering
    
```

Editing

# Relational model

Oracle SQL Developer Data Modeler

File Edit View Versioning Tools Help

Browser

- Designs [1]
  - Orderdb
    - Logical Model
      - Entities [4]
        - Customer
        - Order
        - OrderLine
        - Product
      - Relations [3]
        - Relation\_2 (Customer - 0..\*:1..1 - Order)
        - Relation\_4 (Order - 0..\*:1..1 - OrderLine)
        - Relation\_6 (Product - 0..\*:1..1 - OrderLine)
      - Inheritances []
      - Views []
      - SubViews []
      - Displays []
    - Multidimensional Models []
    - Relational Models [1]
      - Relational\_1
        - Tables [4]
          - Customer
          - Order
          - OrderLine
          - Product
        - Views []
        - Foreign Keys [3]
        - Schemas []
        - SubViews []
        - Physical Models []
        - Displays []
  - Domains [1]
  - Data Types Model
  - Process Model
  - Business Information
  - Change Requests []

Start Page x Logical (Orderdb) x Relational\_1 (Orderdb) x

```

    erDiagram
        Order ||--o{ Customer : "has"
        Order ||--o{ OrderLine : "has"
        OrderLine ||--o{ Product : "has"
        Order {
            NUMBER OrderNo PK
            DATE OrderDate
            NUMBER CustomerNo FK
        }
        Customer {
            NUMBER CustomerNo PK
            VARCHAR Name
            VARCHAR DeliveryAddress
            VARCHAR MailAddress
        }
        OrderLine {
            NUMBER OrderlineNo PK
            NUMBER Pcs
            NUMBER Price
            NUMBER OrderNo FK
            NUMBER ProductNo FK
        }
        Product {
            NUMBER ProductNo PK
            VARCHAR2 ProductName
        }
  
```

Versioning Navigator

Subversion

SVN Console - Log x Pending Changes x

```

2012-09-17 10:05:55 - Save Design: 'Orderdb'
2012-09-17 10:05:55 - Design Orderdb saved.
2012-09-17 10:22:34 - Forward Engineering
  
```

Messages SVN Console x

Editing

# Table

**Table Properties - Customer** [X]

General

Columns

Primary Key

Unique Constraints

Indexes

Table Level Constraints

Foreign Keys

Nested Columns

Volume Properties

Spatial Properties

Column Groups

Comments

Comments in RDBMS

Notes

Impact Analysis

Measurements

Change Requests

Responsible Parties

Documents

Scripts

Dynamic Properties

Summary

General

Name: Customer

Long Name: Customer

Abbreviation:

Engineer:

PK Name: Customer PK

Classification Type:

Temp Table Scope:

Based on Structured Type:

Schema:

Register as Spatial Table:

Object Identifier is PK:

Allow Type Substitution:

Generate in DDL:

OK Apply Naming Rules Cancel Help

**Table Properties - Customer**

Columns

General  
**Columns**  
 Primary Key  
 Unique Constraints  
 Indexes  
 Table Level Constraints  
 Foreign Keys  
 Nested Columns  
 Volume Properties  
 Spatial Properties  
 Column Groups  
 Comments  
 Comments in RDBMS  
 Notes  
 Impact Analysis  
 Measurements  
 Change Requests  
 Responsible Parties  
 Documents  
 Scripts  
 Dynamic Properties  
 Summary

Details Overview Security

Columns:

	Name	Data type
1	CustomerNo	NUMERIC
2	name	VARCHAR (50)
3	DeliveryAddress	VARCHAR (200)
4	MailAddress	VARCHAR (50)

Column Properties

Name: CustomerNo

Datatype:  Domain  Logical  Distinct  
 Structured  Collection

Type: NUMERIC Preferred

Precision:

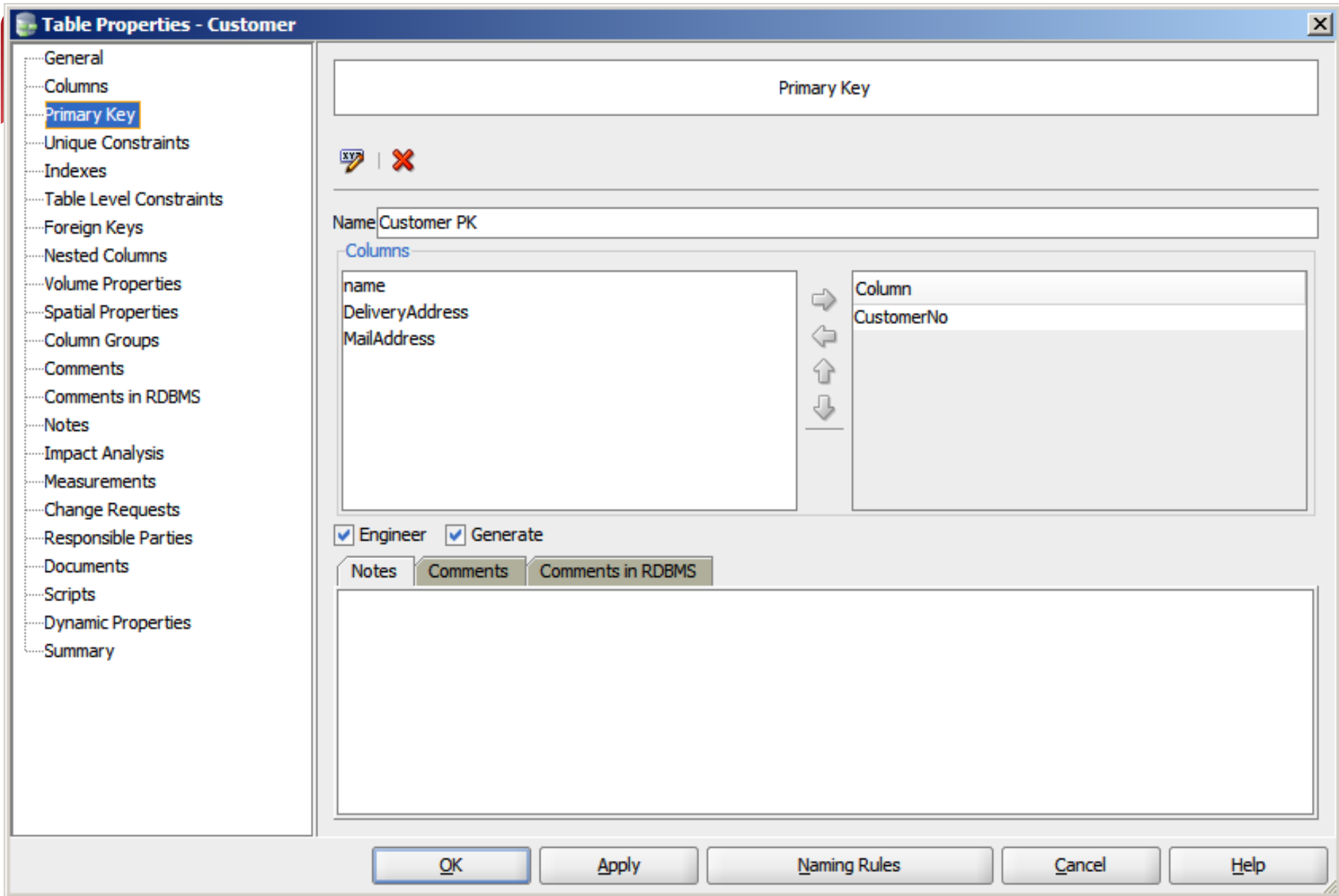
Scale:

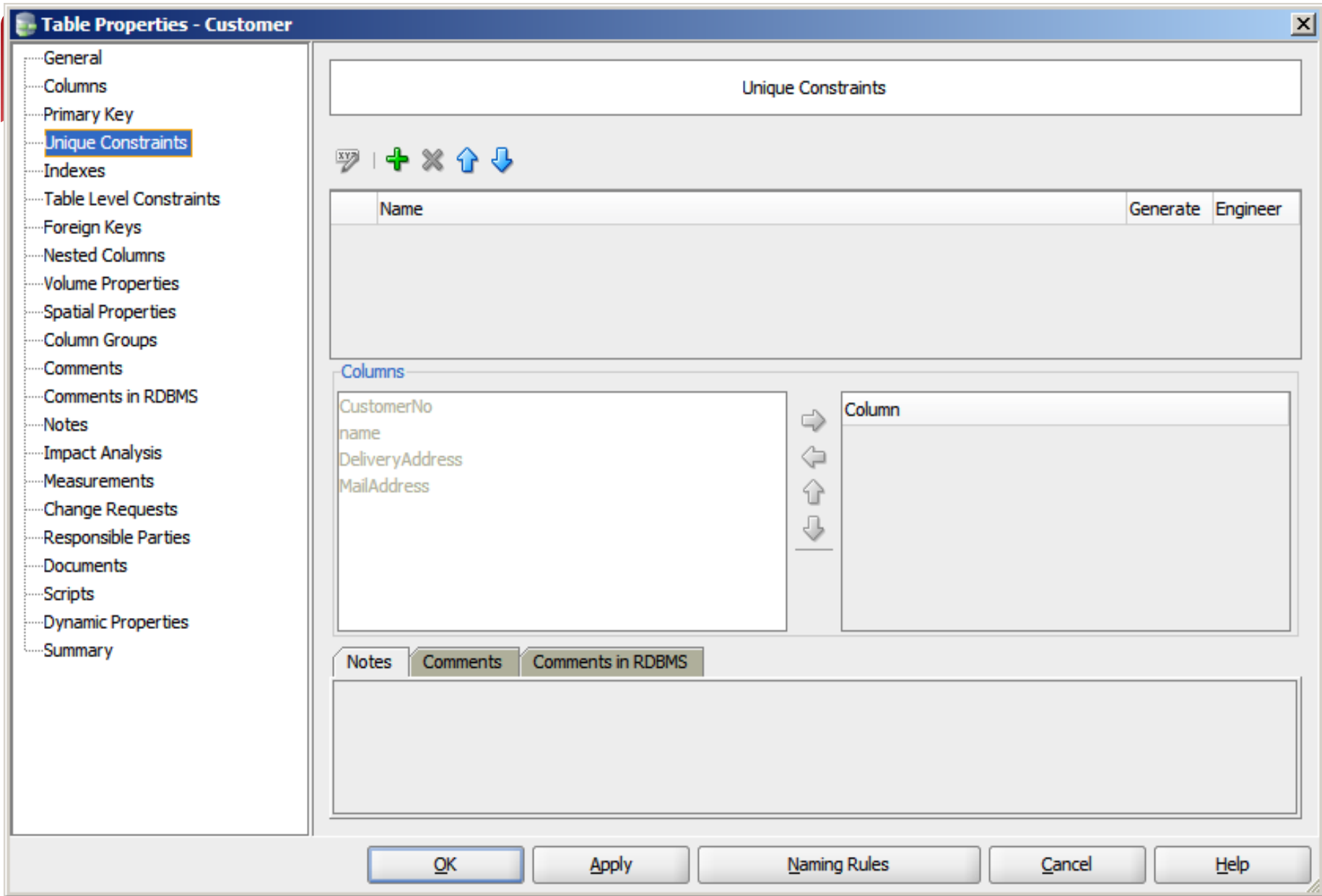
PK  FK  Mandatory

Comments Comments in RDBMS Notes

OK Apply Naming Rules Cancel Help












**Table Properties - Customer**

- General
- Columns
- Primary Key
- Unique Constraints
- Indexes**
- Table Level Constraints
- Foreign Keys
- Nested Columns
- Volume Properties
- Spatial Properties
- Column Groups
- Comments
- Comments in RDBMS
- Notes
- Impact Analysis
- Measurements
- Change Requests
- Responsible Parties
- Documents
- Scripts
- Dynamic Properties
- Summary

**Indexes**

Name	Unique	Generate	Engineer	Spatial

Index Expression:

**Columns**

Column	Desc
CustomerNo	
name	
DeliveryAddress	
MailAddress	

**Table Properties - Customer** [X]

- General
- Columns
- Primary Key
- Unique Constraints
- Indexes
- Table Level Constraints
- Foreign Keys
- Nested Columns
- Volume Properties
- Spatial Properties
- Column Groups
- Comments
- Comments in RDBMS
- Notes
- Impact Analysis
- Measurements
- Change Requests
- Responsible Parties
- Documents
- Scripts
- Dynamic Properties
- Summary**

**Summary**

Object ID: 3D8F3AA6-04B6-2FB7-A73D-CE677D82F540

Creator: helskyaho\_h

Creation Time: 2011-12-13 11:35:20 EET

Last Changed By: helskyaho\_h

Last Changed Time: 2012-01-19 13:17:27 EET

Generator Name: Customer

Design: OrderDB

Repository OID: NONE

OK Apply Naming Rules Cancel Help

# Column

**Column Properties - CustomerNo**

General

- Default and Constraint
- Auto Increment
- Security
- UI Defaults
- Permitted Subtypes
- Comments
- Comments in RDBMS
- Notes
- Impact Analysis
- Measurements
- Change Requests
- Responsible Parties
- Documents
- Dynamic Properties
- Summary

General

Name: CustomerNo

Table: Customer

Abbreviation

Engineer:

Allow Nulls:

Datatype: NUMBER [NUMERIC] ...

Type:

Computed:

Column Expression:

Auto Increment  Identity Column

Scope:

Type Substitution: ALL

OK Apply Cancel Help

**Column Properties - CustomerNo** [X]

- General
- Default and Constraint**
- Auto Increment
- Security
- UI Defaults
- Permitted Subtypes
- Comments
- Comments in RDBMS
- Notes
- Impact Analysis
- Measurements
- Change Requests
- Responsible Parties
- Documents
- Dynamic Properties
- Summary

**Default and Constraint**

Constraint Name:

Not Null Constraint Name:

Uses Default:

Default Value:

Use Domain Constraints:

Constraint:

List Of Ranges:

List Of Values:

# Primary Key



**Primary Key Properties - Customer PK**

- General
- Comments
- Comments in RDBMS
- Notes
- Impact Analysis
- Measurements
- Change Requests
- Responsible Parties
- Documents
- Dynamic Properties
- Summary

**General**

Name:

Long Name:

Engineer:

Table:

State:

Schema:

Generate in DDL:

**Columns**

name	→	Column
DeliveryAddress	←	CustomerNo
MailAddress	↑	
	↓	

OK    Apply    Cancel    Help

# Foreign Key

**Foreign Key Properties - Relation\_1** [X]

**General**

Associated Columns

Comments

Notes

Impact Analysis

Dynamic Properties

Summary

**General**

Name:

Table:

PK / UK Index:

Delete Rule:

Source Table Synonym:

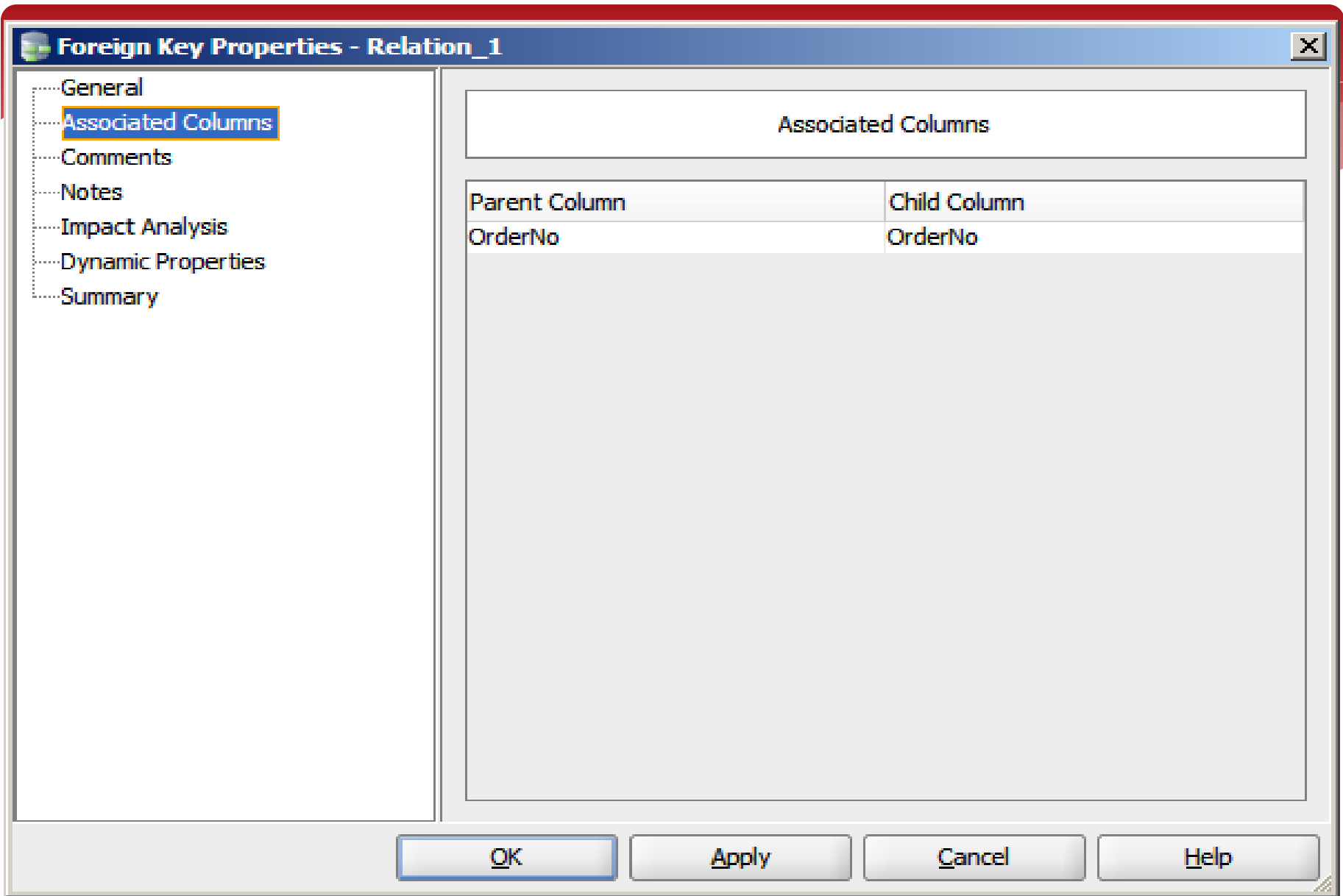
Target Table Synonym:

Mandatory:

Transferable (Updatable):

Generate in DDL:

In Arc:



# From relational to physical

Oracle SQL Developer Data Modeler

File Edit View Versioning Tools Help

Start Page x Logical (Orderdb) x Relational\_1 (Orderdb) x

Browser

- Designs [1]
  - Orderdb
    - Logical Model
      - Entities [4]
        - Customer
        - Order
        - OrderLine
        - Product
      - Relations [3]
        - Relation\_2 (Customer - 0..\*:1..1 - Order)
        - Relation\_4 (Order - 0..\*:1..1 - OrderLine)
        - Relation\_6 (Product - 0..\*:1..1 - OrderLine)
      - Inheritances []
      - Views []
      - SubViews []
      - Displays []
    - Multidimensional Models []
    - Relational Models [1]
      - Relational\_1
        - Tables [4]
          - Order
          - OrderLine
          - Product
          - Customer
        - Views []
        - Foreign Keys [3]
          - OrderLine\_PK (OrderLineNo, OrderNo)
          - Order\_PK (OrderNo)
          - Product\_PK (ProductNo)
        - Schemas []
        - SubViews []
        - Physical Models []
        - Displays []
  - Domains [1]
  - Data Types Model
  - Process Model
  - Business Information
  - Change Requests []

Versioning Navigator

Subversion

SVN Console - Log x Pending Changes x

```

propset svn:ignore "*" .localiz " C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/rel/34ff578a-ee8fbf201
propset svn:ignore "*" .localiz *.local " C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/rel/34ff578a-ee8fbf201
2012-09-17 10:28:15 - Design Orderdb saved.
  
```

Messages SVN Console x

Editing

```

erDiagram
    Order ||--o{ Customer : "has"
    Order ||--o{ OrderLine : "has"
    OrderLine ||--o{ Product : "has"
    OrderLine ||--o{ Order : "has"
  
```

Order

P *	OrderNo	NUMBER
	OrderDate	DATE
F *	CustomerNo	NUMBER
PK	Order_PK (OrderNo)	

Customer

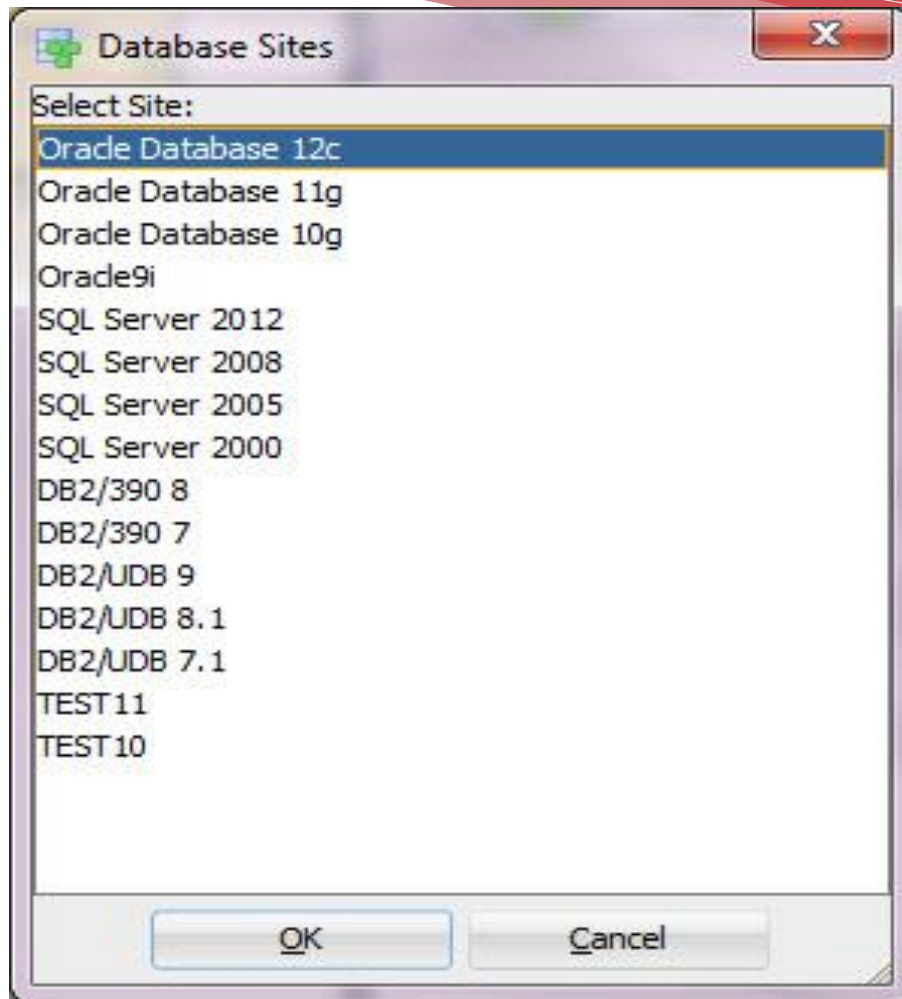
P *	CustomerNo	NUMBER
	Name	VARCHAR
	DeliveryAddress	VARCHAR
	MailAddress	VARCHAR
PK	Customer_PK (CustomerNo)	

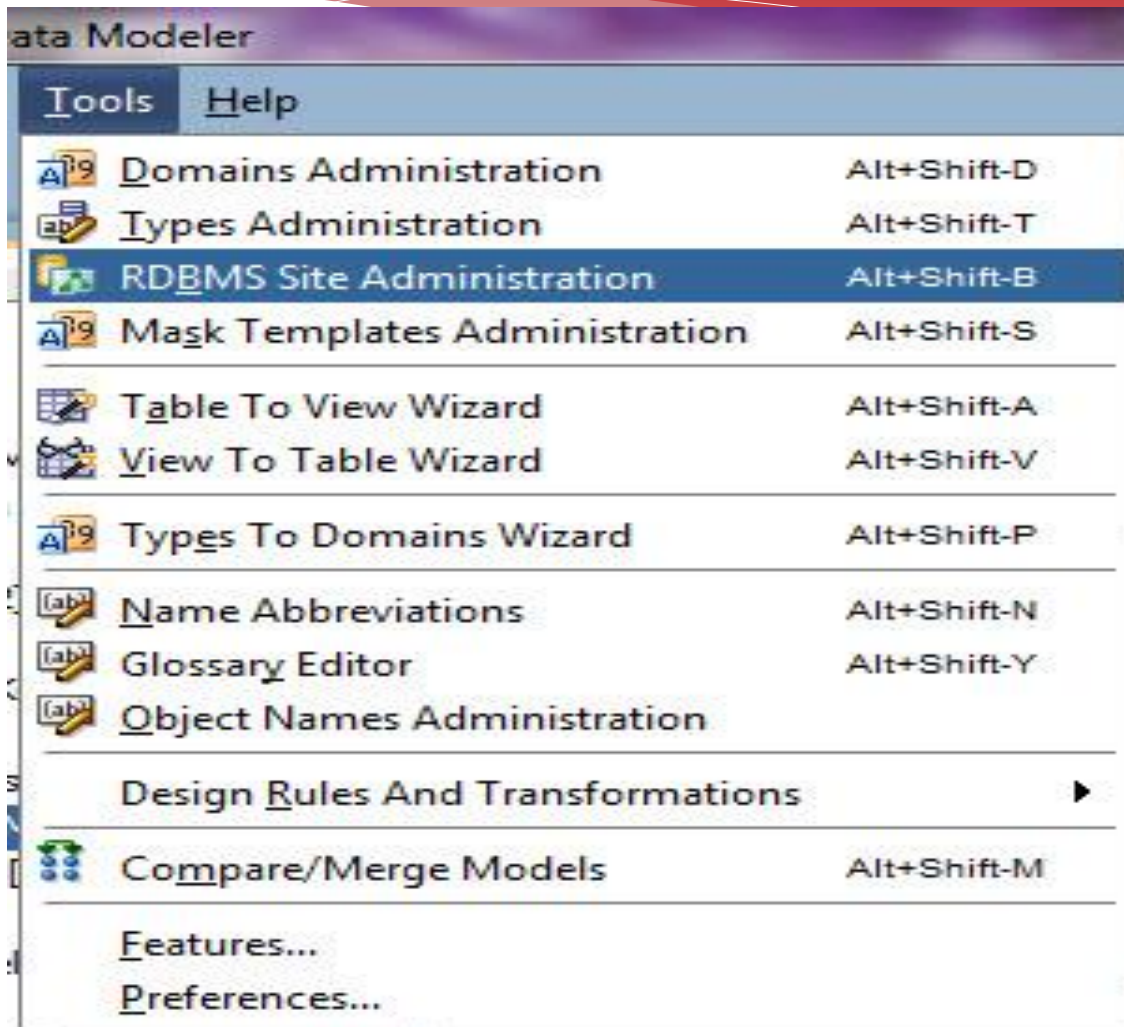
OrderLine

P *	OrderlineNo	NUMBER (10)
	Pcs	NUMBER
	Price	NUMBER (17,2)
PF *	OrderNo	NUMBER
F *	ProductNo	NUMBER (10)
PK	OrderLine_PK (OrderlineNo, OrderNo)	

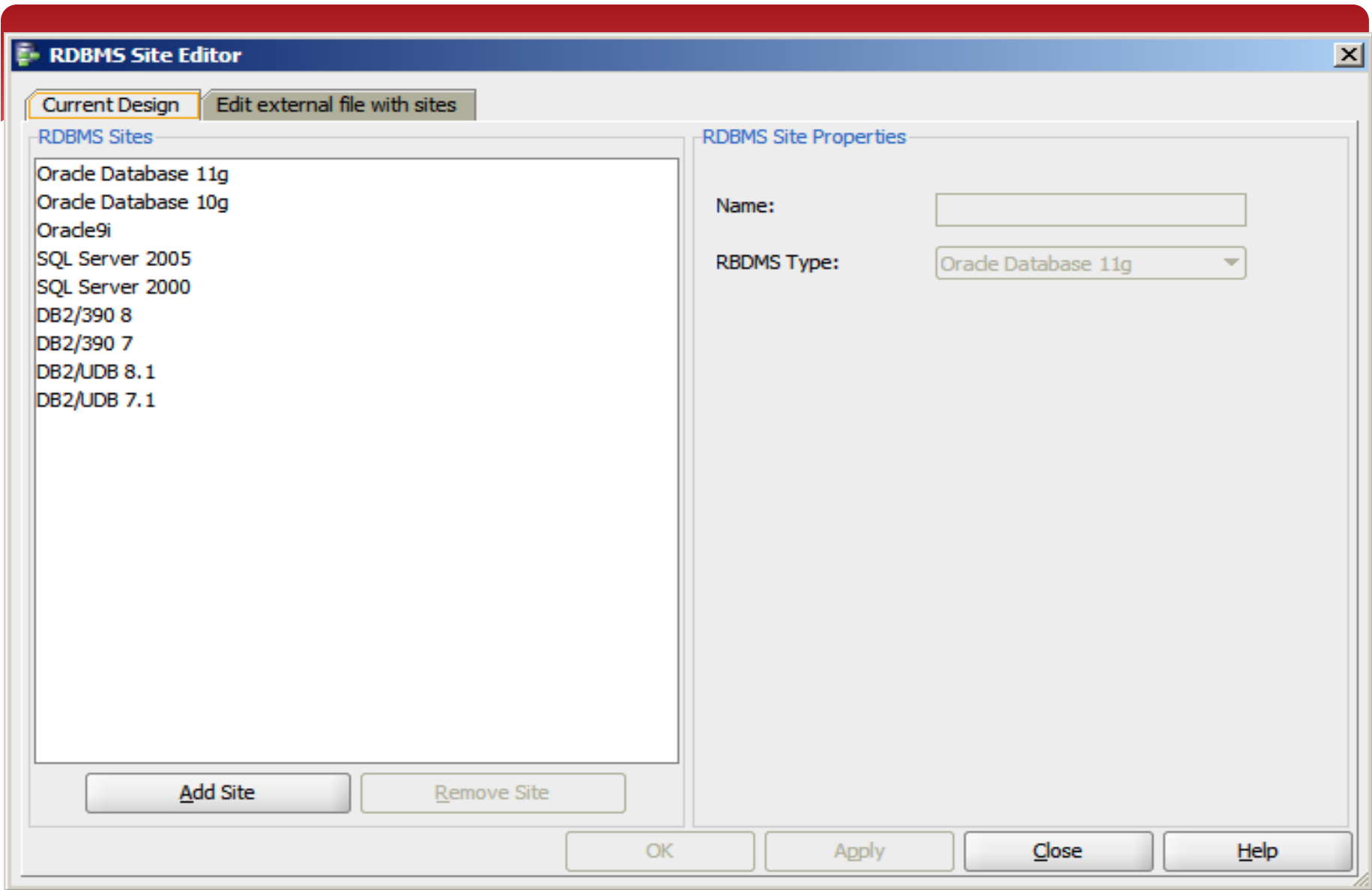
Product

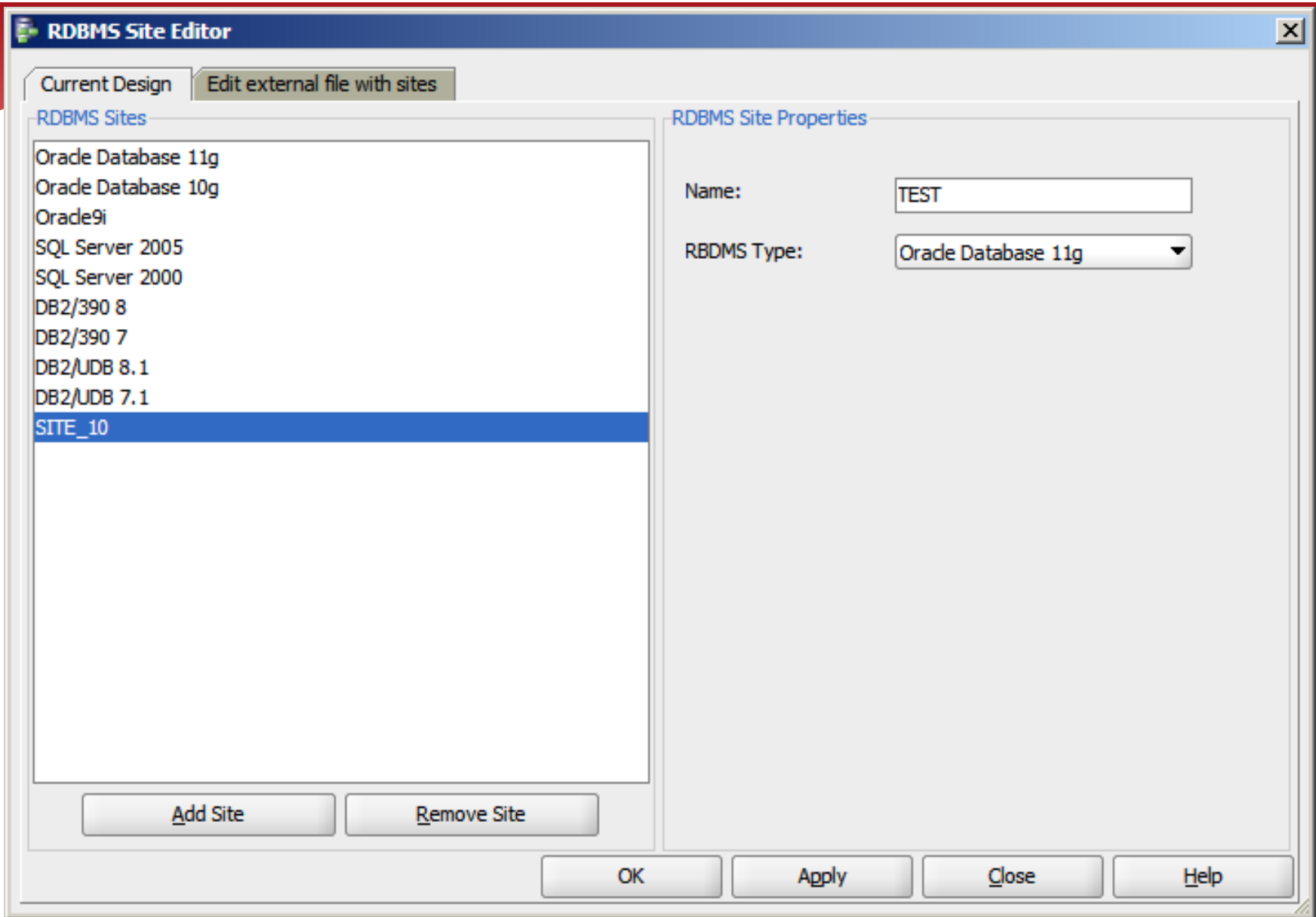
P *	ProductNo	NUMBER (10)
	ProductName	VARCHAR2
PK	Product_PK (ProductNo)	

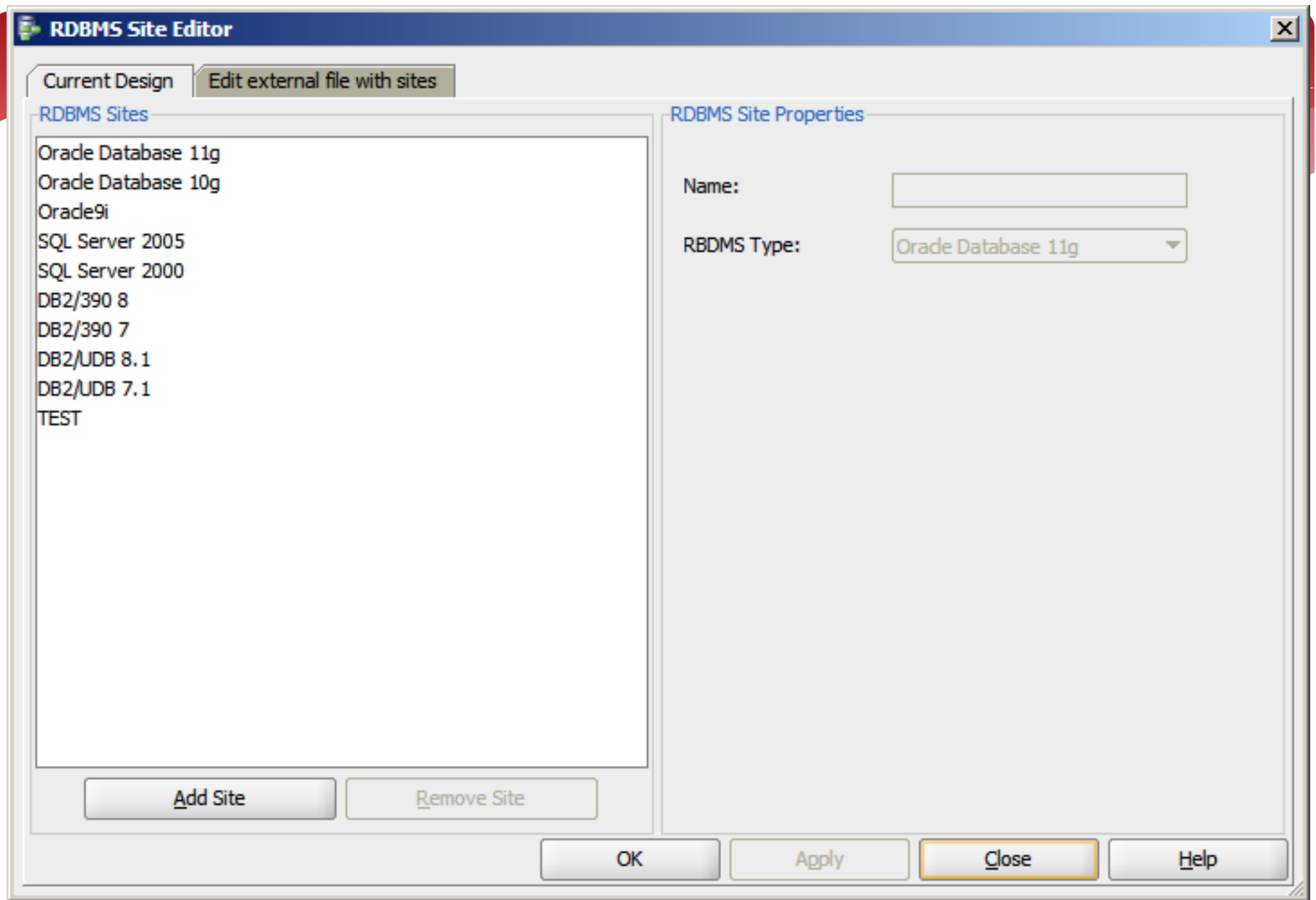


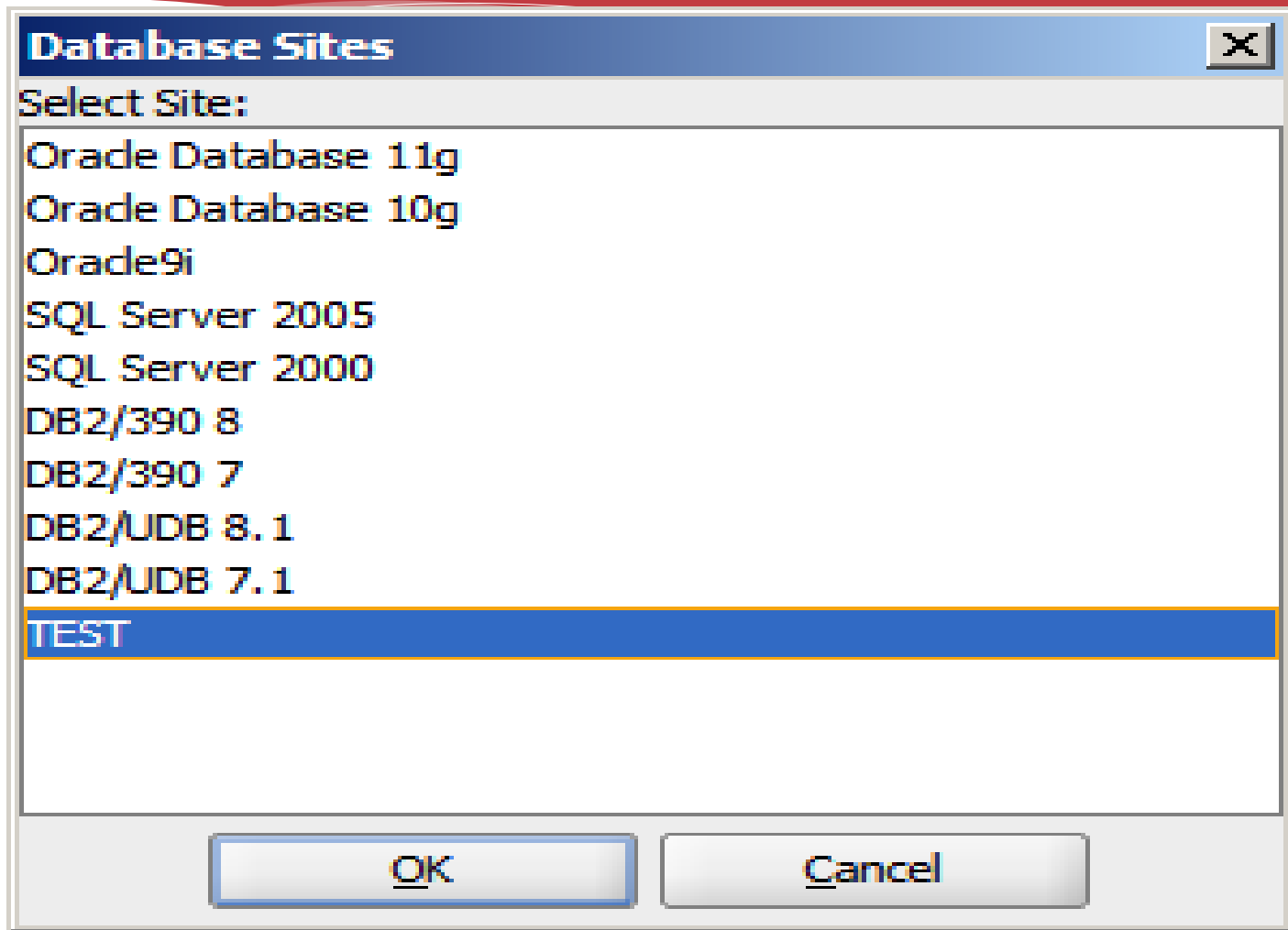












# Physical model

Oracle SQL Developer Data Modeler

File Edit View Versioning Tools Help

Browser

- Inheritances []
- Views []
- SubViews []
- Displays []
- Multidimensional Models []
- Relational Models [1]
  - Relational\_1
    - Tables [4]
    - Views []
    - Foreign Keys [3]
    - Schemas []
    - SubViews []
    - Physical Models [1]
      - TEST
        - Clusters []
        - Contexts []
        - Databases []
        - Dimensions []
        - Directories []
        - Disk Groups []
        - External Tables []
        - Materialized Views []
        - Roles []
        - Rollback Segments []
        - Storage Templates []
        - Sequences []
        - Stored Procedures []
        - Functions []
        - Packages []
        - Collection Types []
        - Structured Types [2]
        - Synonyms []
        - Tables [4]
        - Tablespaces []
        - Temp Tablespaces []
        - Undo Tablespaces []
        - Users [2]
        - Views []

- Domains [1]
- Data Types Model
- Process Model
- Business Information

Start Page x Logical (Orderdb) x Relational\_1 (Orderdb) x

```

    erDiagram
        Order ||--o{ Customer : "has"
        Order ||--o{ OrderLine : "has"
        OrderLine ||--o{ Product : "has"

        Order {
            NUMBER OrderNo PK
            DATE OrderDate
            NUMBER CustomerNo FK
        }
        Customer {
            NUMBER CustomerNo PK
            VARCHAR Name
            VARCHAR DeliveryAddress
            VARCHAR MailAddress
        }
        OrderLine {
            NUMBER OrderLineNo PK
            NUMBER Price
            NUMBER OrderNo FK
            NUMBER ProductNo FK
        }
        Product {
            NUMBER ProductNo PK
            VARCHAR2 ProductName
        }
  
```

Versioning Navigator

Subversion

Relational\_1

SVN Console - Log x Pending Changes x

```

propset svn:ignore "*" .localiz " C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/rel/34FF578A-EE8FB820/1
propset svn:ignore "*" .localiz *.local " C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/rel/34FF578A-EE8FB820/1
2012-09-17 10:28:15 - Design Orderdb saved.
  
```

Messages SVN Console x

Editing

# Properties

Oracle SQL Developer Data Modeler

File Edit View Versioning Tools Help

Browser

- Inheritances []
- Views []
- SubViews []
- Displays []
- Multidimensional Models []
- Relational Models [1]
  - Relational\_1
    - Tables [4]
      - Customer
      - Order
      - OrderLine
      - Product
    - Views []
    - Foreign Keys [3]
      - Order\_PK (OrderNo)
      - OrderLine\_PK (OrderlineNo, Ord
      - Customer\_PK (CustomerNo)
    - Schemas []
    - SubViews []
    - Physical Models [1]
      - TEST
        - Clusters []
        - Contexts []
        - Databases []
        - Dimensions []
        - Directories []
        - Disk Groups []
        - External Tables []
        - Materialized Views []
        - Roles []
        - Rollback Segments []
        - Storage Templates []
        - Sequences []
        - Stored Procedures []
        - Functions []
        - Packages []
        - Collection Types []
        - Structured Types [2]
        - Synonyms []
        - Tables [4]
          - Customer
          - Order
          - OrderLine
          - Product
        - Tablespaces []
        - Temp Tablespaces []
        - Undo Tablespaces []
        - Users [2]
        - Views []

Versioning Navigator

Subversion

Relational\_1

SVN Console - Log x Pending Changes x

```

propset svn:ignore "*" localiz " C:/ohjelmat/datamodeler mallit/DesignsDirectory/Orderdb/Orderdb/re1/34FF578A-E28F8E98F20/1
propset svn:ignore "*" local " C:/ohjelmat/DataModeler mallit/DesignsDirectory/Orderdb/Orderdb/re1/34FF578A-E28F8E98F20/1
2012-09-17 10:28:15 - Design Orderdb saved.
  
```

Messages SVN Console x

Editing

```

erDiagram
    Order ||--o{ OrderLine : "has"
    Order ||--o{ Customer : "has"
    OrderLine ||--o{ Product : "has"
    OrderLine ||--o{ OrderLine : "has"

    Order {
        NUMBER OrderNo PK
        DATE OrderDate
        NUMBER CustomerNo FK
    }
    OrderLine {
        NUMBER(10) OrderlineNo PK
        NUMBER Pos
        NUMBER(17) Price
        NUMBER OrderNo FK
        NUMBER(10) ProductNo FK
    }
    Customer {
        NUMBER CustomerNo PK
        VARCHAR Name
        VARCHAR DeliveryAddress
        VARCHAR MailAddress
    }
    Product {
        NUMBER(10) ProductNo PK
        VARCHAR2 ProductName
    }
  
```



**Table Properties - Customer**

Supplemental Log    **OID Properties**    XMLType Properties    Comments

General    **Cluster Columns**    Partitioning    IOT Properties

Name:

User:

Temporary:

TableSpace:

Organization:

Cluster:

Logging:

Storage:

Cache:

Parallel:

Degree:

Row Dependency:

Partitioned:

Row Movement:

Data Compression:

Structured Type:

Implement as Materialized View:

Propagate Properties      Permissions...

**Properties Propagation** [X]

Properties

Selected	Name	Value
<input checked="" type="checkbox"/>	<b>User</b>	
<input checked="" type="checkbox"/>	<b>Temporary</b>	NO
<input checked="" type="checkbox"/>	<b>Preserve Rows</b>	YES
<input checked="" type="checkbox"/>	<b>TableSpace</b>	
<input checked="" type="checkbox"/>	<b>Organization</b>	HEAP
<input checked="" type="checkbox"/>	<b>Cluster</b>	
<input checked="" type="checkbox"/>	<b>Logging</b>	YES
<input checked="" type="checkbox"/>	<b>Storage</b>	
<input checked="" type="checkbox"/>	<b>Cache</b>	NO
<input checked="" type="checkbox"/>	<b>Parallel</b>	NO
<input checked="" type="checkbox"/>	<b>Degree</b>	
<input checked="" type="checkbox"/>	<b>Row Dependency</b>	NO
<input checked="" type="checkbox"/>	<b>Partitioned</b>	NO
<input checked="" type="checkbox"/>	<b>Row Movement</b>	ENABLE
<input checked="" type="checkbox"/>	<b>Data Compression</b>	NO

Select All    Deselect All

Objects

Selected	Name
<input type="checkbox"/>	<b>Order</b>
<input type="checkbox"/>	<b>OrderLine</b>
<input type="checkbox"/>	<b>Product</b>

Select All    Deselect All

OK    Cancel

**TableSpace Properties - TableSpace1** [X]

Indexes | Storage | Materialized Views | Comments

General | Default Storage | Clusters | Tables

Name:

Datafiles:

File Type:

Min. Ext Len:

Block size:

Logging:

Force Logging:

Status:

Contents:

Default Compression:

Ext. Management:

EM Local SubType:

EM Uniform Size:

Seg. Management:

Flashback Mode:

**Role Properties - Role1** [X]

General Roles SystemPrivileges Comments

Name:


Identified:

Identification Type:

Password:

Schema:

Package:

 Permissions...

**User Properties - User3** [X]

Sequences   Synonyms   Procedures   Comments  
Materialized Views   Triggers   Views   Dimensions  
General   Roles   System Privileges   Clusters   Tables   Indexes

Name:

Authentication:

Identifier:

TableSpace:

Temp TableSpace:

Temp TS Group:


Profile:

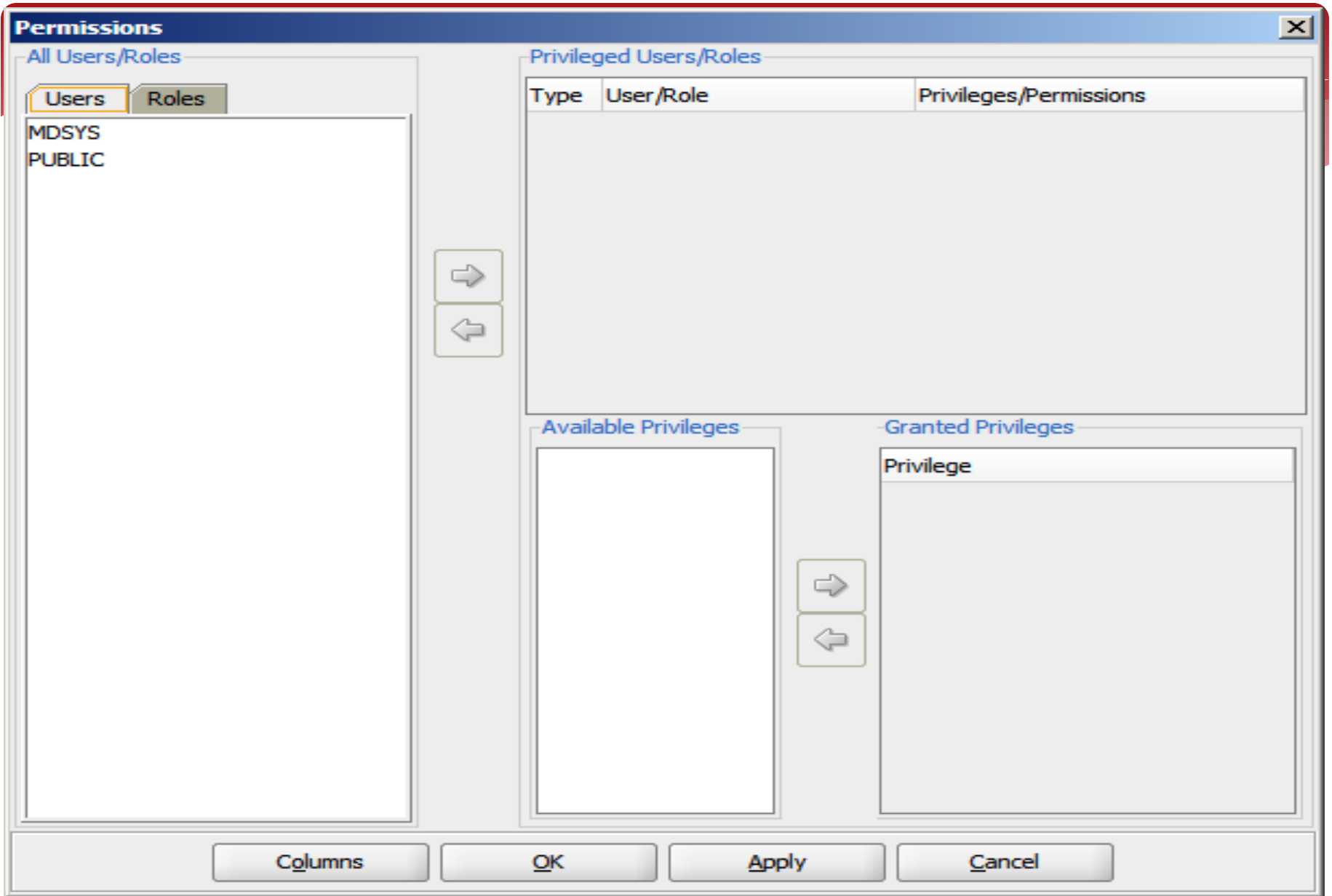
Password Expire:

Account Lock:

External Name:

Implements Schema:

 Permissions...



# Physical to DDLs

Oracle SQL Developer Data Modeler

File Edit View Versigning Tools Help

Start Page x Logical (Orderdb) x Relational\_1 (Orderdb) x

Export To Data Modeler Design

DDL File

Cube Views Metadata

To Microsoft XMLA

To Oracle AW

To CSV

To Reporting Schema

Contexts []

Databases []

Dimensions []

Directories []

Disk Groups []

External Tables []

Materialized Views []

Roles []

Rollback Segments []

Storage Templates []

Sequences []

Stored Procedures []

Functions []

Packages []

Collection Types []

Structured Types [2]

Synonyms []

Tables [4]

Customer

Order

OrderLine

Product

Tablespaces []

Temp Tablespaces []

Undo Tablespaces []

Users [2]

Views []

Displays []

Domains [1]

Versioning Navigator x

Subversion

Relational\_1

Messages - Log x Pending Changes x

Orderdb (C:\ohjelmat\DataModeler mallit\DesignsDirectory)\...

Incoming Changes: 0 Outgoing Changes: 0 Unversioned Files: 0

Editing

```

    erDiagram
        Order ||--o{ Customer : "1 to many"
        Order ||--o{ OrderLine : "1 to many"
        OrderLine ||--o{ Product : "1 to many"
    
```

**Order**

P *	OrderNo	NUMBER
	OrderDate	DATE
F *	CustomerNo	NUMBER
	Order_PK (OrderNo)	

**Customer**

P *	CustomerNo	NUMBER
	Name	VARCHAR
	DeliveryAddress	VARCHAR
	MailAddress	VARCHAR
	Customer_PK (CustomerNo)	

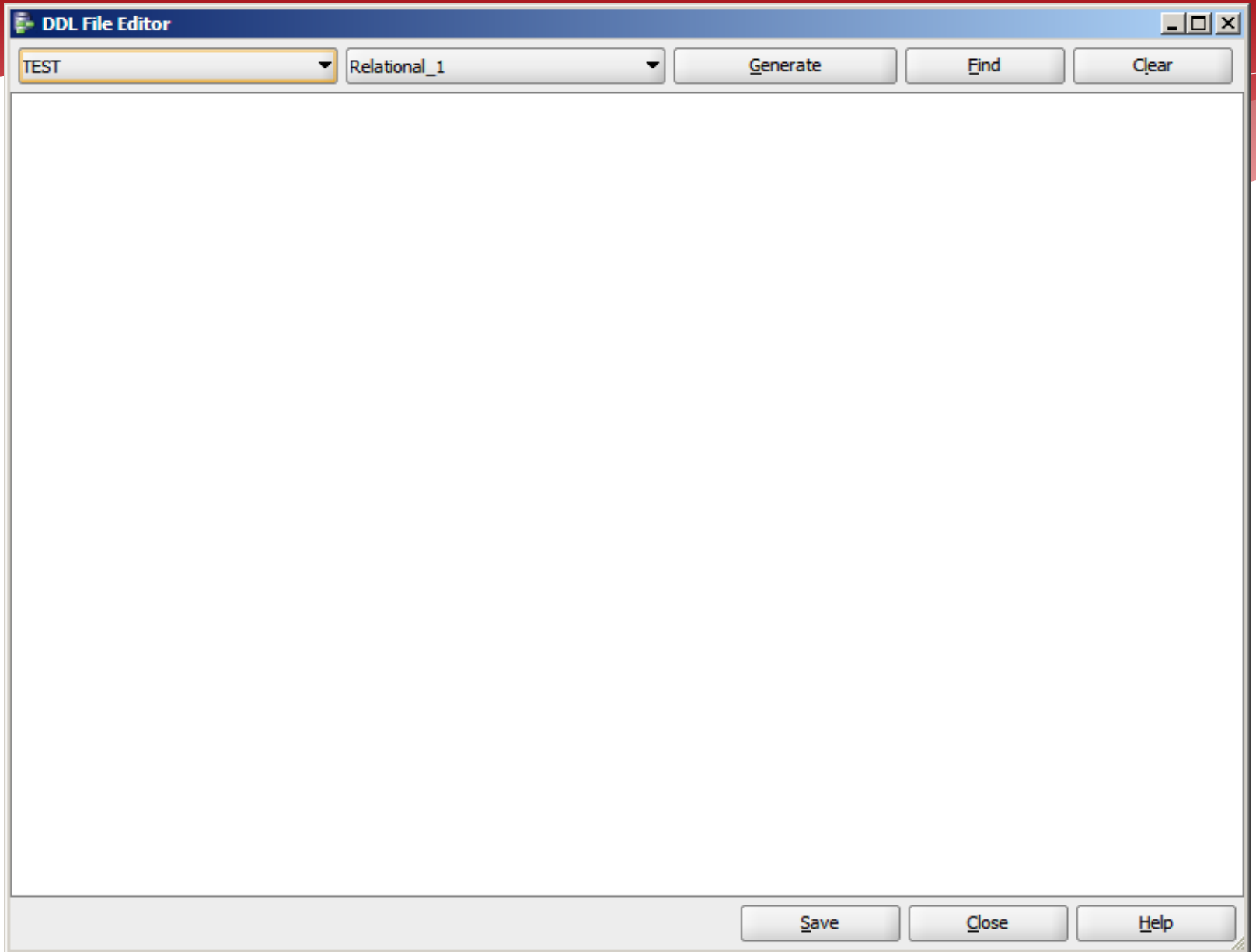
**OrderLine**

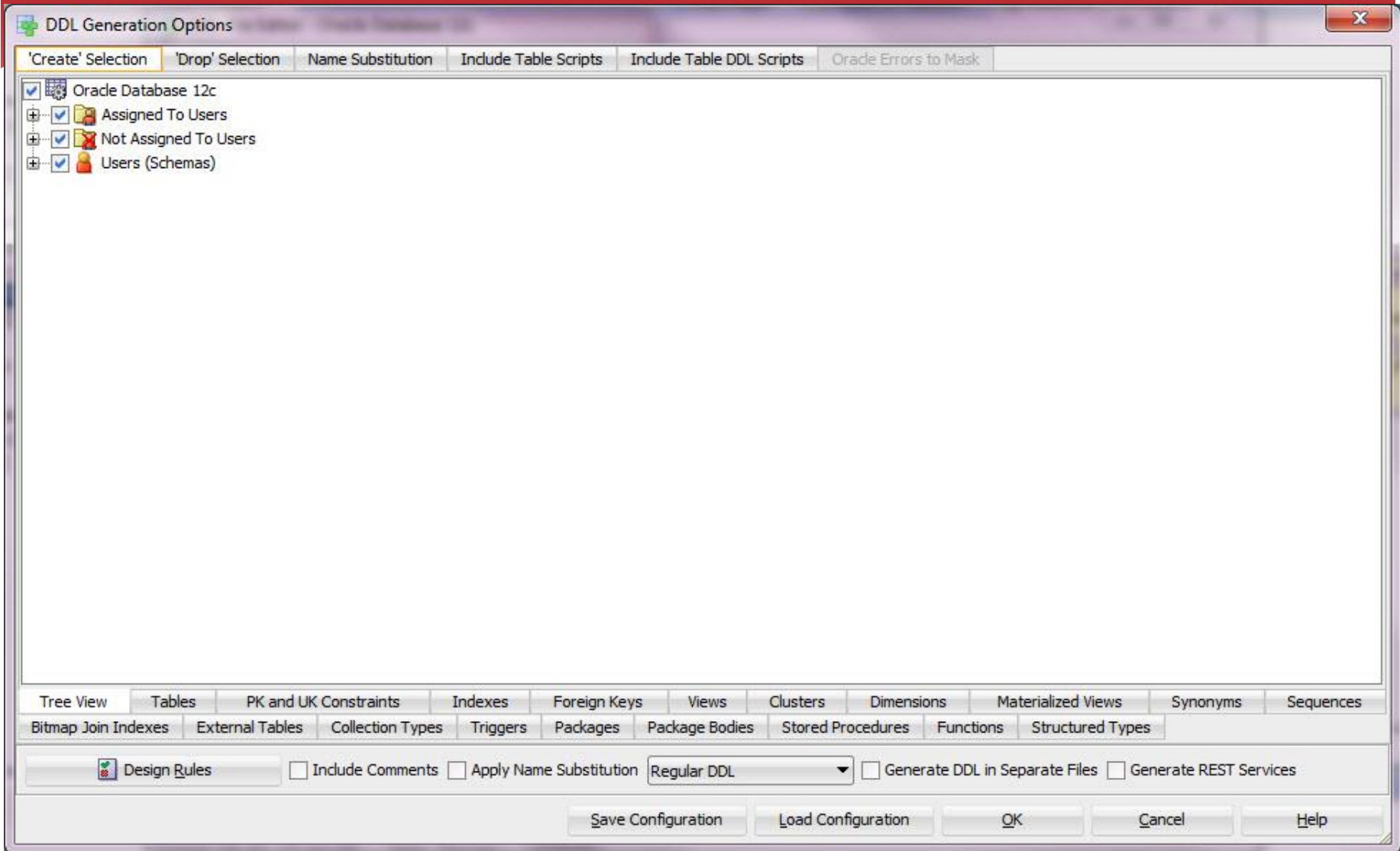
P *	OrderlineNo	NUMBER (10)
	Pcs	NUMBER
	Price	NUMBER (17,2)
PF *	OrderNo	NUMBER
F *	ProductNo	NUMBER (10)
	OrderLine_PK (OrderlineNo, OrderNo)	

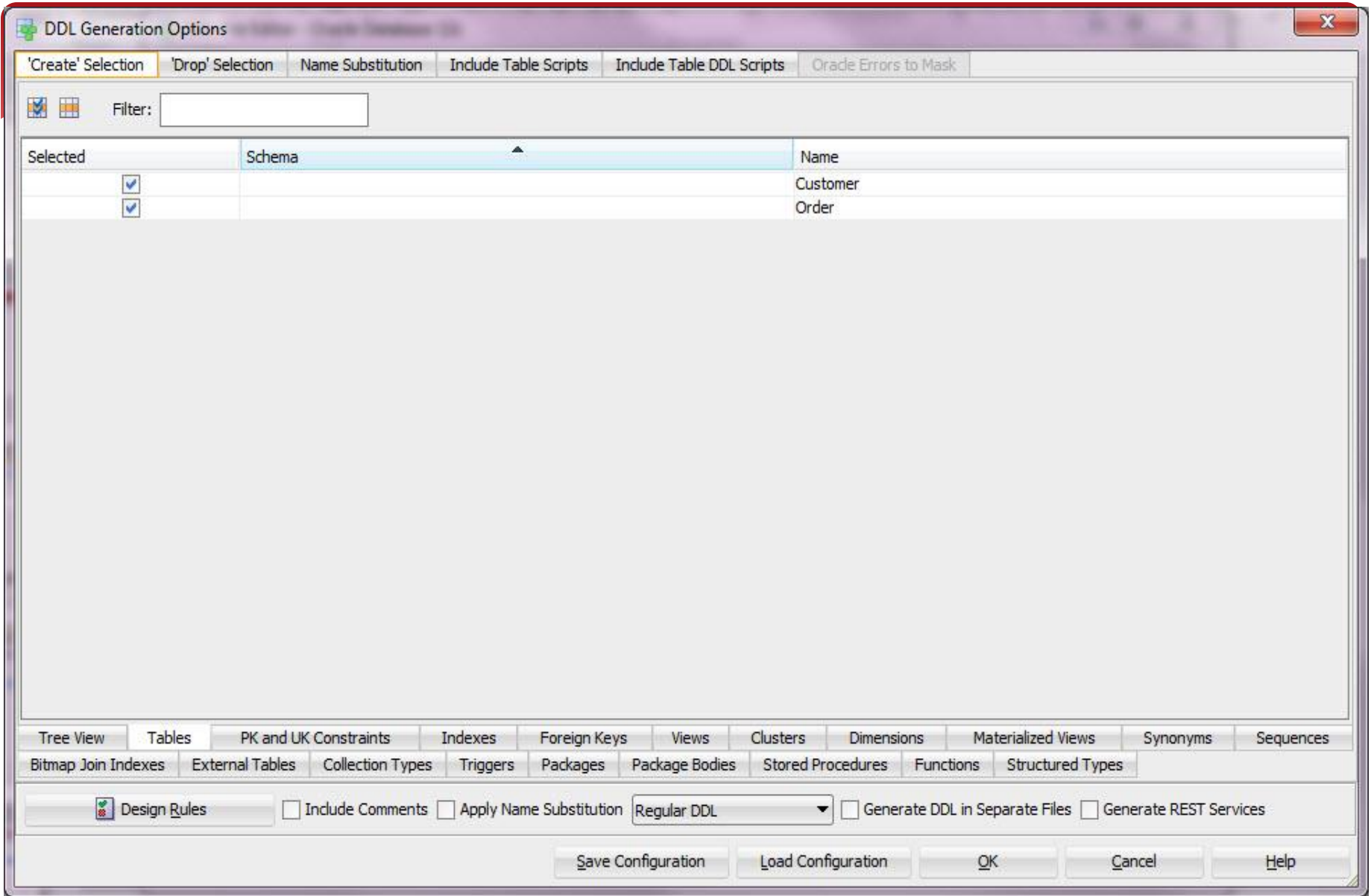
**Product**

P *	ProductNo	NUMBER (10)
	ProductName	VARCHAR2
	Product_PK (ProductNo)	









**DDL Generation Options**

'Create' Selection | 'Drop' Selection | Name Substitution | Include Table Scripts | Orade Errors to Mask

Name Substitution | Object Types

+ X | [icon] [icon]

Selected	Case Sensitive	Old	New	Comments
<input checked="" type="checkbox"/>	<input type="checkbox"/>	USER	TEST	Use this when generating the DDLs for testing environment.

Design Rules
  Include Comments
  Apply Name Substitution
 Regular DDL

OK Cancel Help

DDL Generation Options

'Create' Selection 'Drop' Selection Name Substitution Include Table Scripts Grade Errors to Mask

Name Substitution Object Types

Selected	Type
<input type="checkbox"/>	Index
<input checked="" type="checkbox"/>	Table
<input type="checkbox"/>	Tablespace
<input type="checkbox"/>	User

Design Rules  Include Comments  Apply Name Substitution Regular DDL

OK Cancel Help

DDL File Editor - Oracle Database 11g

Oracle Database 11g    Generate    Clear    Find

```
-- Generated by Oracle SQL Developer Data Modeler 3.1.0.683
-- at:          2011-12-13 13:11:12 EET
-- site:       Oracle Database 11g
-- type:       Oracle Database 11g

CREATE TABLE Customer
(
  CustomerNo NUMBER NOT NULL ,
  name VARCHAR2 (50) NOT NULL ,
  DeliveryAddress VARCHAR2 (200) ,
  MailAddress VARCHAR2 (50)
) LOGGING
;

ALTER TABLE Customer
  ADD CONSTRAINT "Customer PK" PRIMARY KEY ( CustomerNo ) ;

CREATE TABLE "Order"
(
  OrderNo NUMBER NOT NULL ,
  OrderDate DATE NOT NULL ,
  CustomerNo NUMBER
) LOGGING
;

ALTER TABLE "Order"
  ADD CONSTRAINT "Order PK" PRIMARY KEY ( OrderNo ) ;
```

Save    Close    Help

# Data Modeler and agile

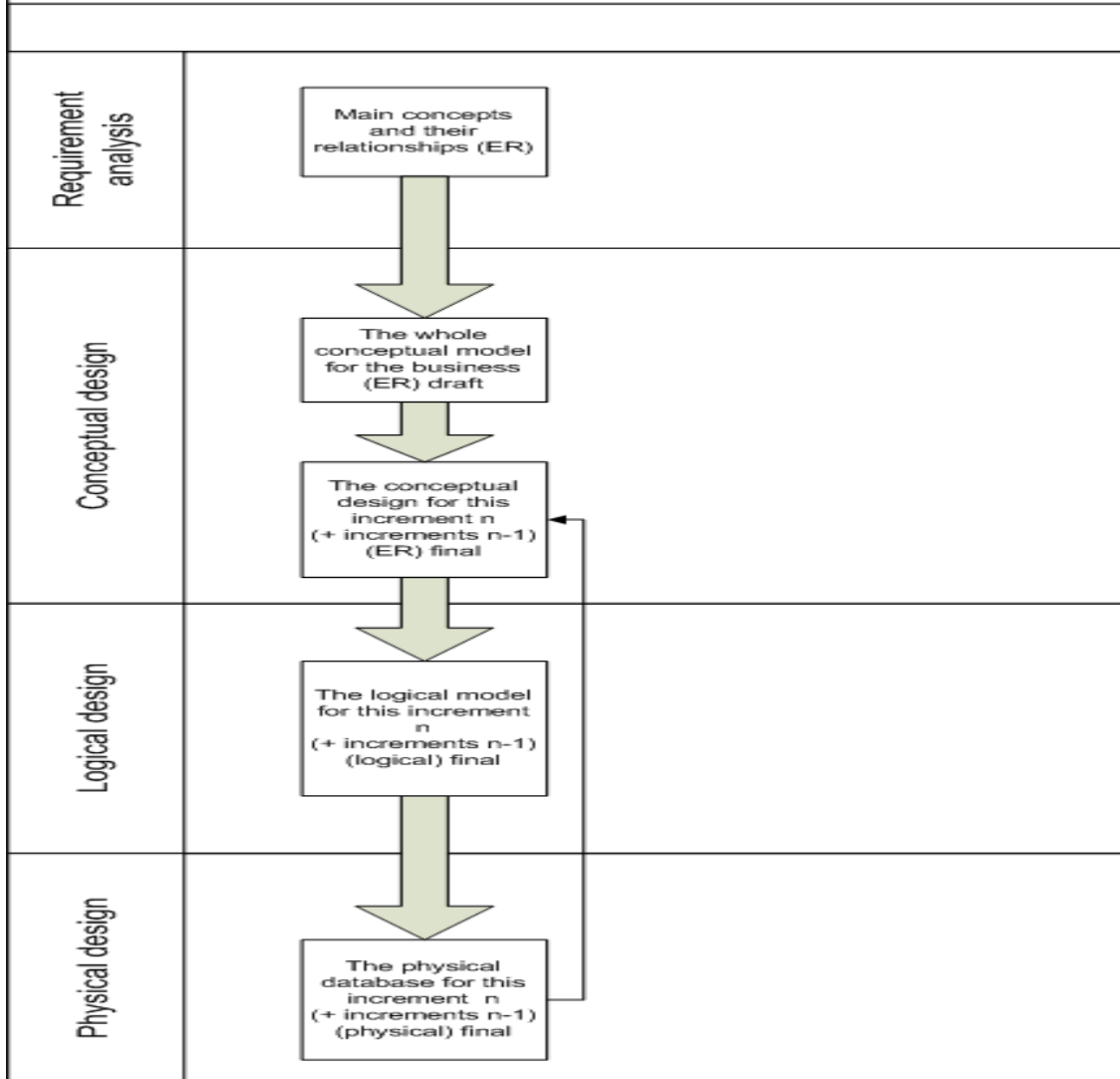
Requirement analysis (Logical, ER: main concepts)

Conceptual design (Logical, ER: the big picture)

Logical design (Logical ER: iteration 1-n, Relational iteration 1-n)

Physical design (Relational iteration 1-n, Physical iteration 1-n,  
DLLs 1-n iteration)

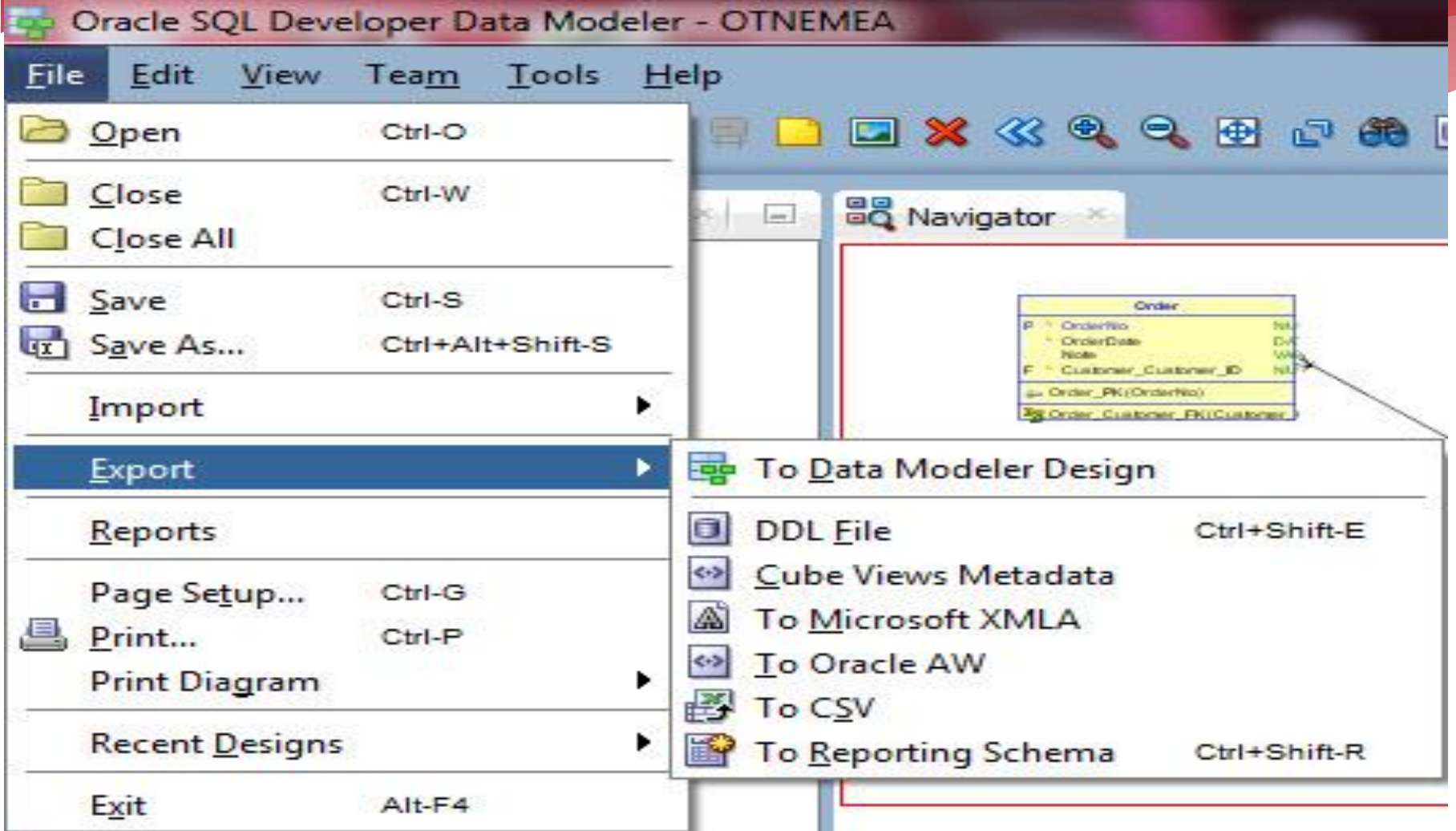
## Data Modeling Process, "agile"

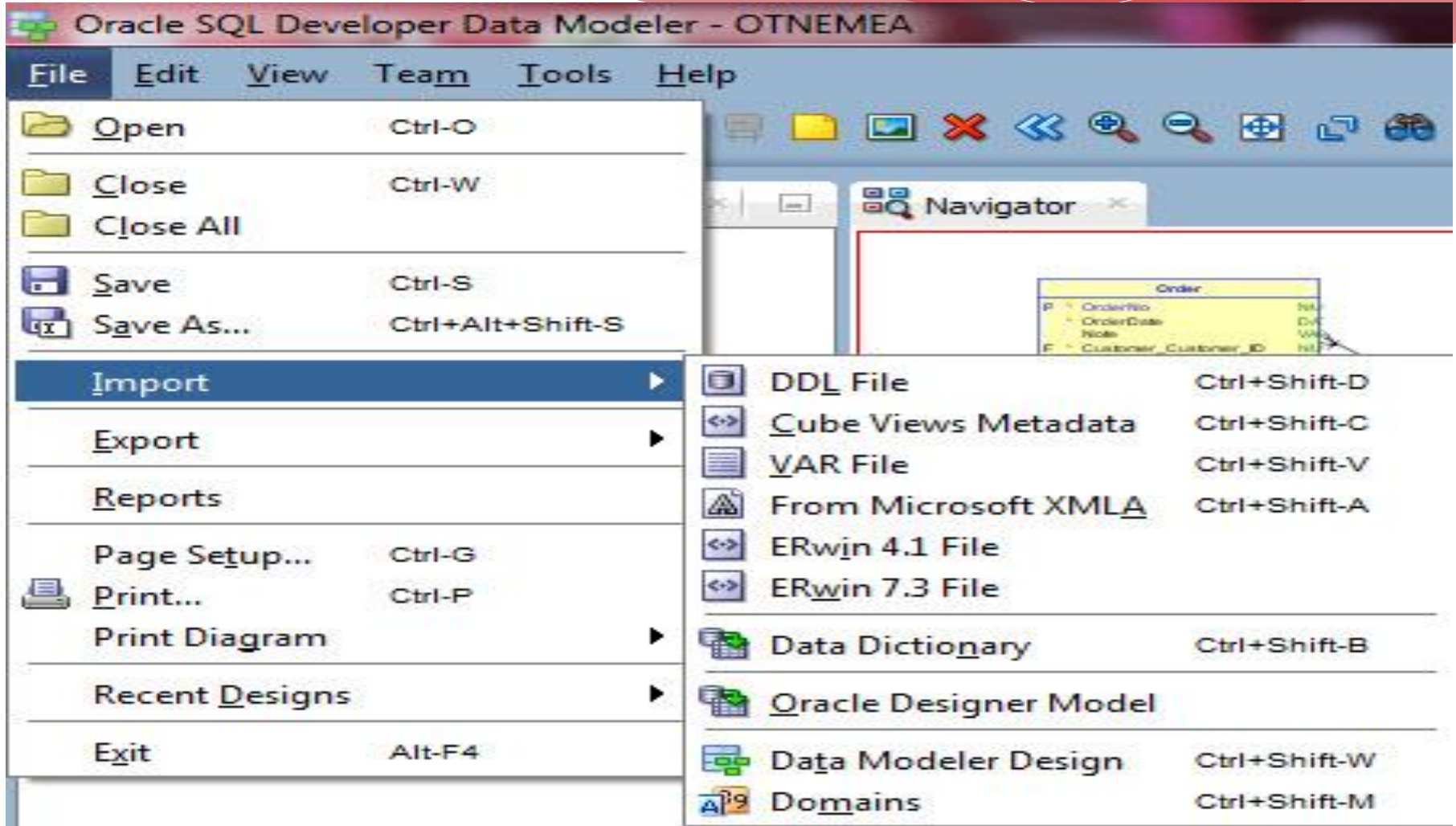




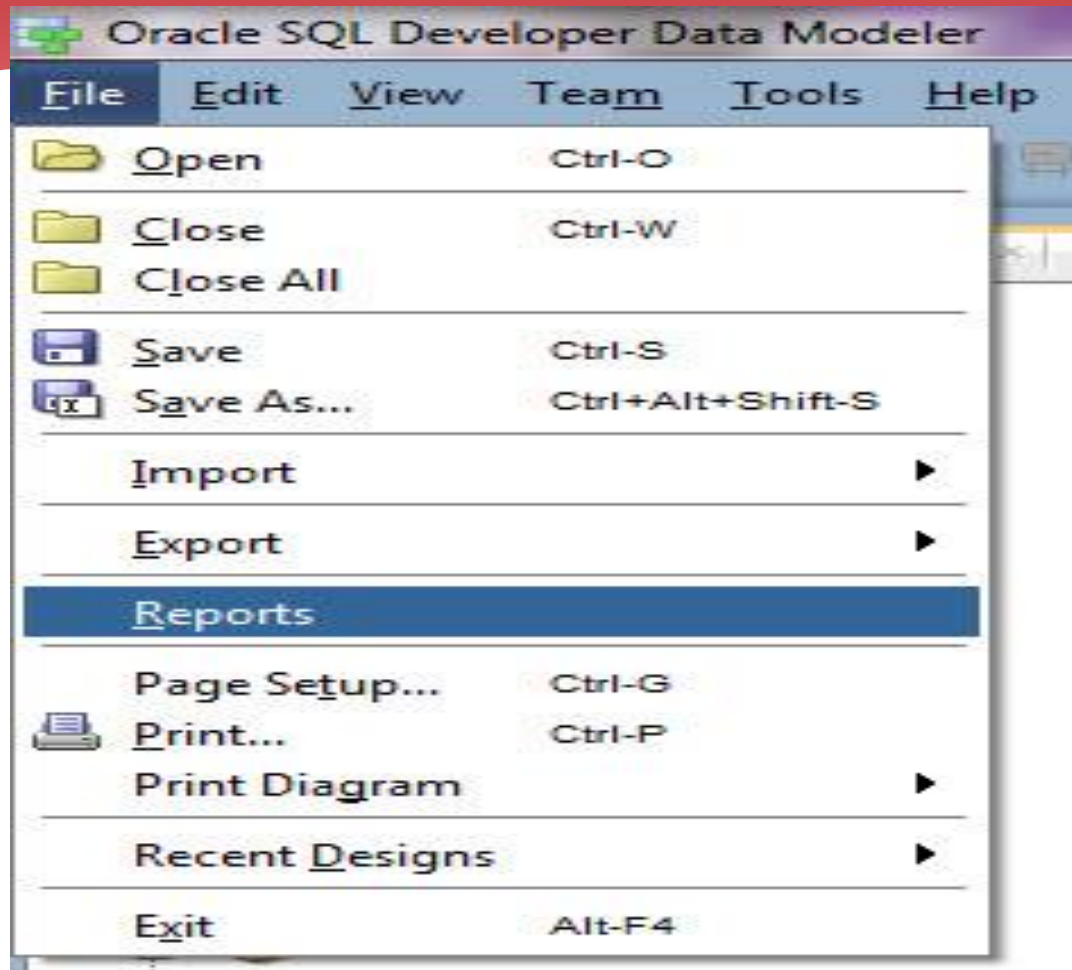
# Other functionalities

# Export/Import





# Reporting



Reports

Available Reports: Tables

Output Format: HTML JVM Options

Report Title: All Tables Details

Report File Name: AllTablesDetails\_1

Templates: Standard Custom

Designs: Loaded Designs Reporting Schema

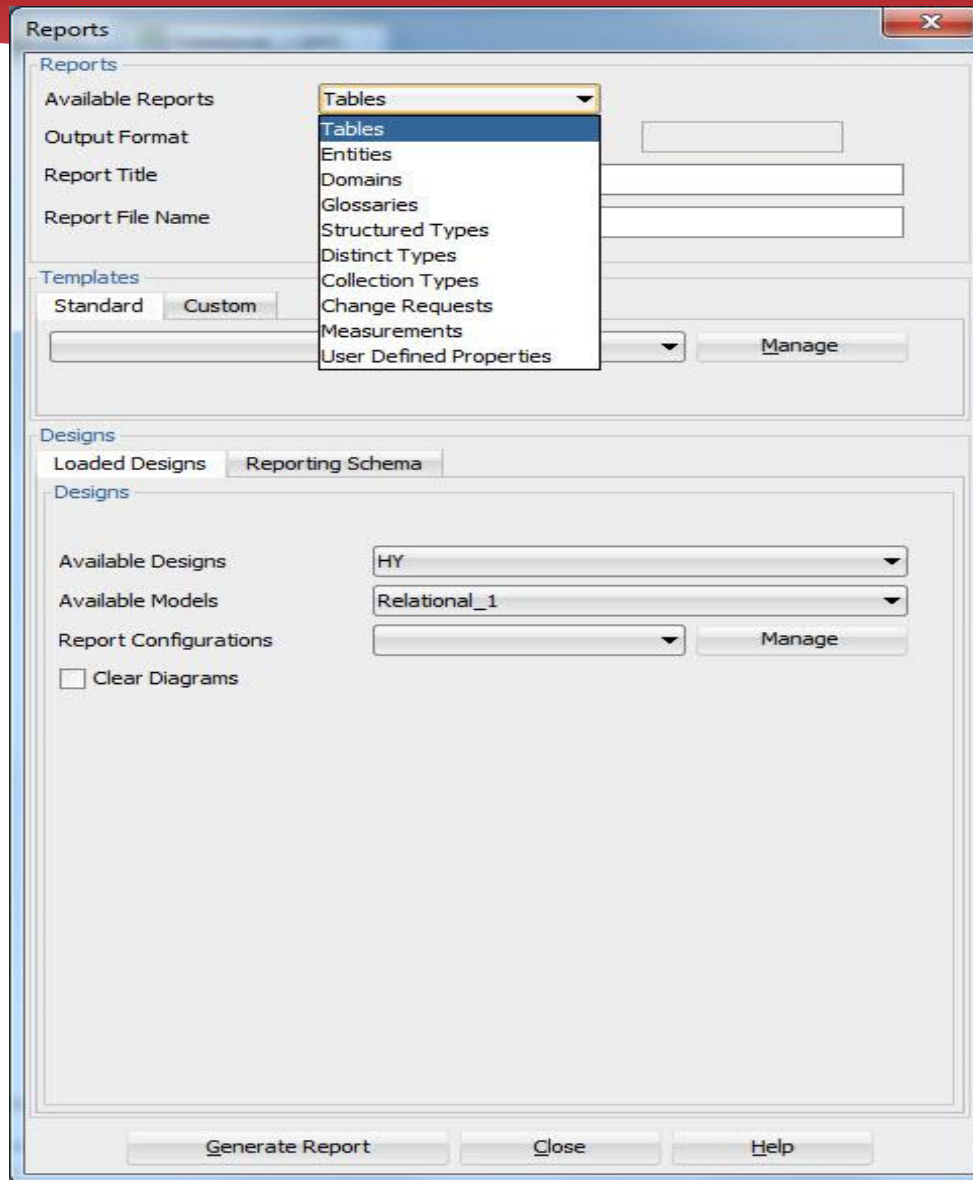
Available Designs: HY

Available Models: Relational\_1

Report Configurations: Manage

Clear Diagrams

Generate Report Close Help



Reports

Reports

Available Reports: Tables

Output Format: HTML (dropdown menu open showing HTML, PDF, RTF) JVM Options: [ ]

Report Title: Details

Report File Name: Details\_1

Templates

Standard Custom

[ ] Manage

Designs

Loaded Designs Reporting Schema

Designs

Available Designs: HY

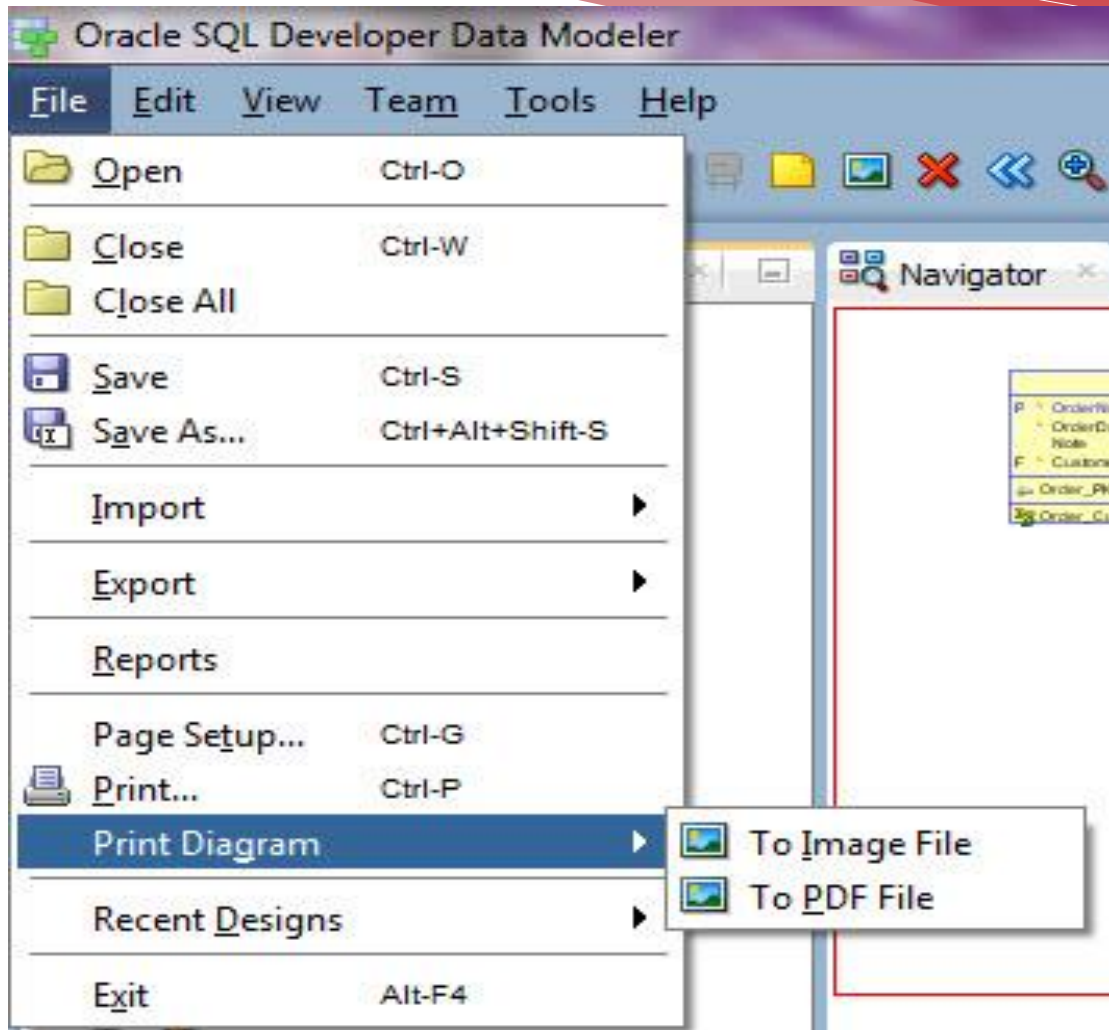
Available Models: Relational\_1

Report Configurations: [ ] Manage

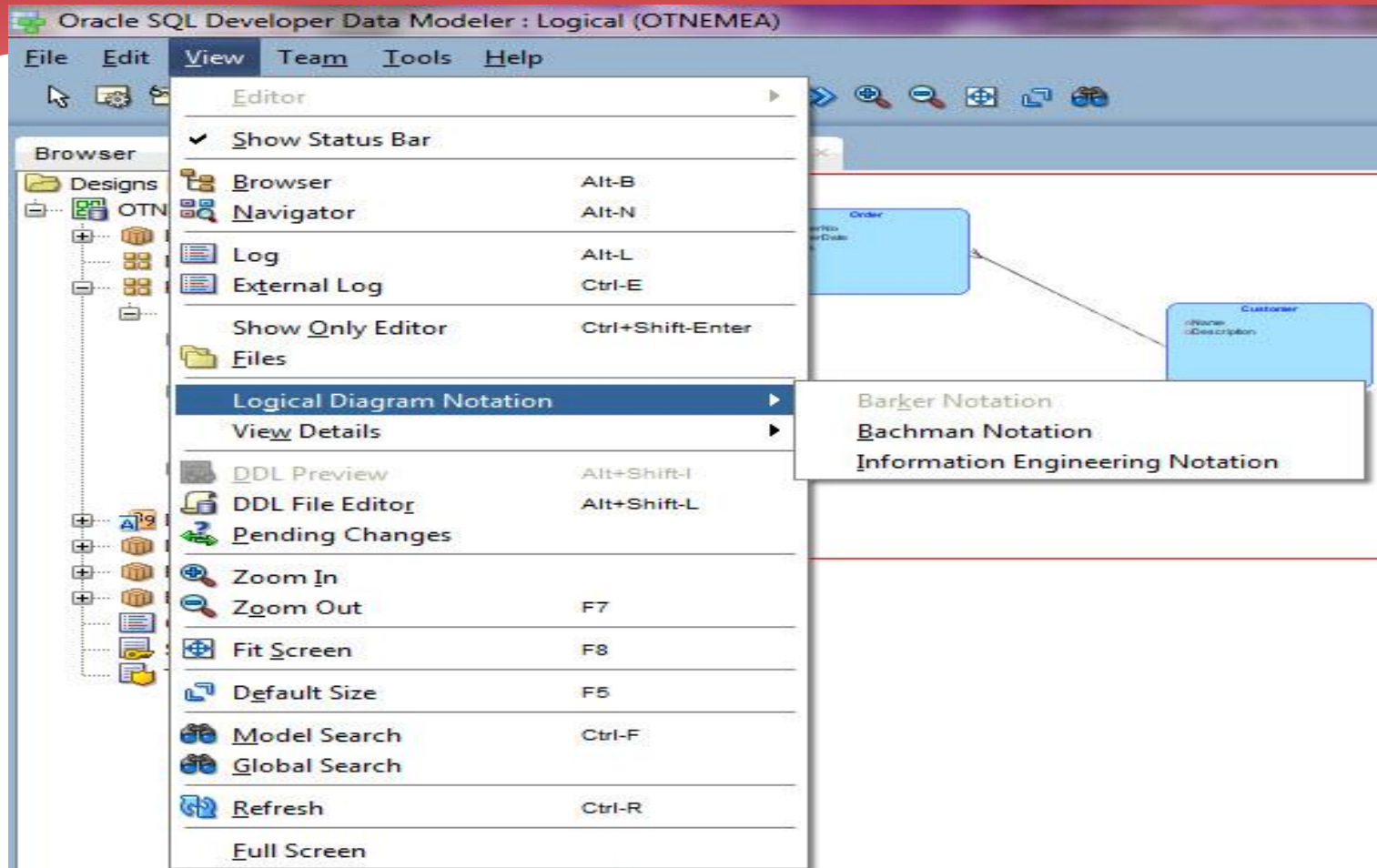
Clear Diagrams

Generate Report Close Help

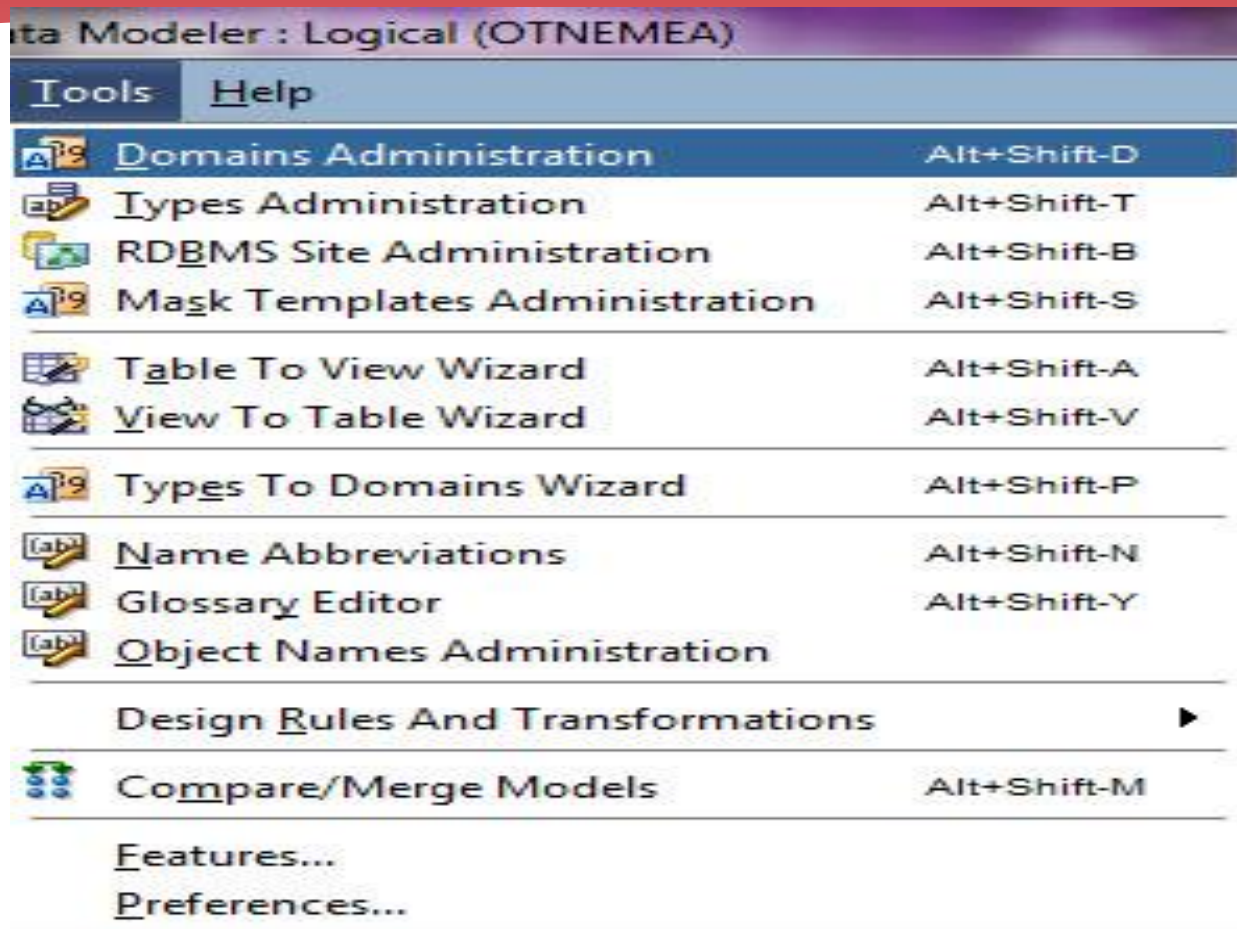




# Notation



# Domains administration



**Domains Administration** [X]

Choose domain

Domains File

Available Domains

Unknown

Domain Properties

Name	<input type="text"/>	Synonym	<input type="text"/>
Logical type	unknown	Comments	<input type="text"/>
Size	<input type="text"/>	Unit of Measure	<input type="text"/>
Units	<input type="text"/>	Default Value	<input type="text"/>
Precision	<input type="text"/>	<input type="button" value="Check Constraint"/>	
Scale	<input type="text"/>	<input type="button" value="Ranges"/>	
Domains File	<input type="text"/>	<input type="button" value="Value List"/>	

**Domains Administration** [X]

Choose domain

Domains File

Available Domains

- Money
- Unknown

**Domain Properties**

Name	<input type="text" value="Money"/>	Synonym	<input type="text"/>
Logical type	<input type="text" value="NUMERIC"/>	Comments	<input type="text"/>
Size	<input type="text" value="15"/>	Unit of Measure	<input type="text"/>
Units	<input type="text" value="CHAR"/>	Default Value	<input type="text"/>
Precision	<input type="text" value="15"/>	<input type="button" value="Check Constraint"/>	
Scale	<input type="text" value="2"/>	<input type="button" value="Ranges"/>	
Domains File	<input type="text" value="defaultdomains"/>	<input type="button" value="Value List"/>	

Entity Properties - OrderLine

Attributes

General  
**Attributes**  
 Unique Identifiers  
 Relationships  
 Volume Properties  
 Engineer To  
 Comments  
 Comments in RDBMS  
 Overlapping Attributes  
 Notes  
 Impact Analysis  
 Measurements  
 Change Requests  
 Responsible Parties  
 Documents  
 Dynamic Properties  
 Summary

Details Overview

Attributes:

Name	Data type
1 OrderlineNo	NUMERIC (10)
2 Pcs	NUMERIC
<b>3 Price</b>	<b>Money</b>
4 OrderNo	NUMERIC
5 ProductNo	NUMERIC (10)

Attribute Properties

Name: Price

Datatype:  Domain  Logical  Distinct  
 Structured  Collection

Type: Money Preferred

Primary UID  Relation UID  Mandatory

Comments Comments in RDBMS Notes

OK Apply Naming Rules Cancel Help

**Column Properties - Price** [X]

**General**

- Default and Constraint
- Auto Increment
- Security
- UI Defaults
- Permitted Subtypes
- Comments
- Comments in RDBMS
- Notes
- Impact Analysis
- Measurements
- Change Requests
- Responsible Parties
- Documents
- Dynamic Properties
- Summary

**General**

Name:

Table:

Abbreviation:

Engineer:

Allow Nulls:

Datatype:  ...

Type:

Computed:

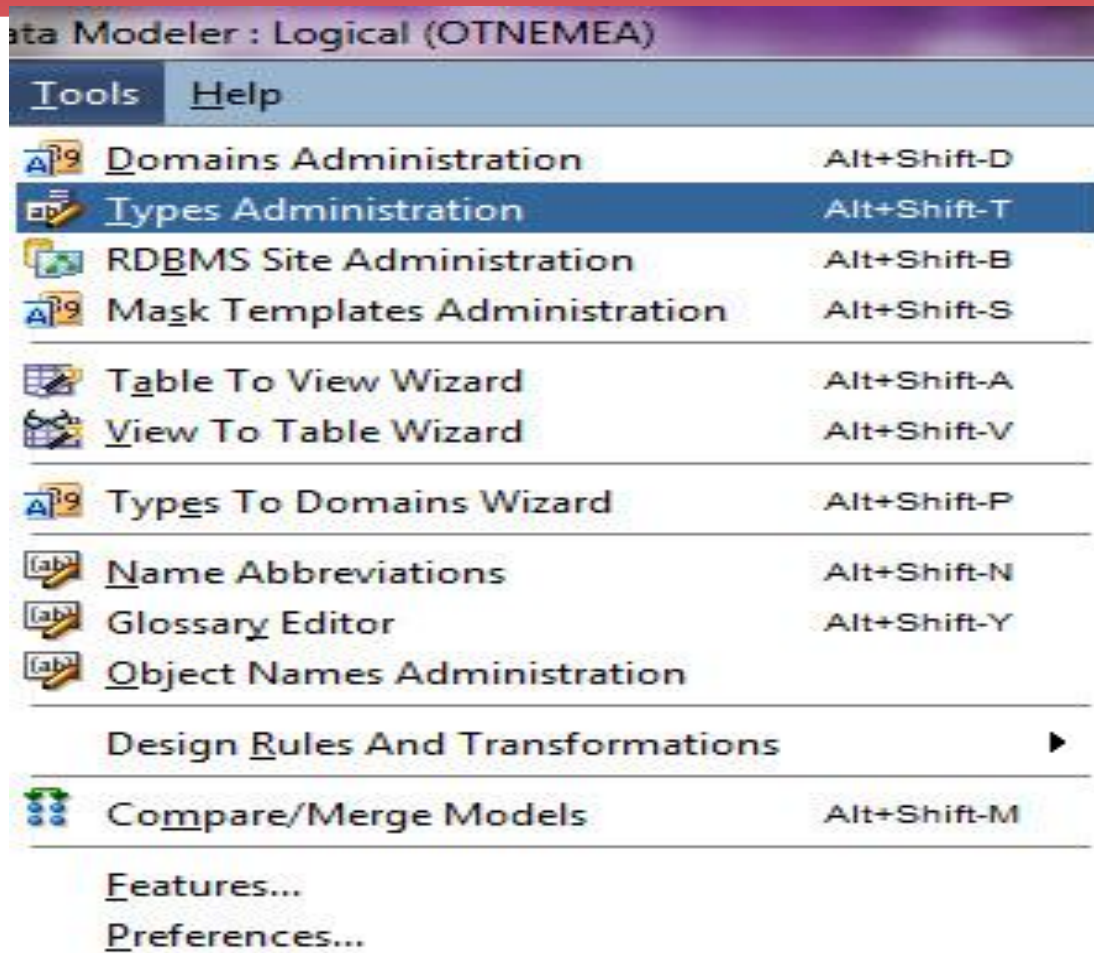
Column Expression:

Auto Increment  Identity Column

Scope:

Type Substitution:

# Types Administration





**Types Administration**

Logical types to native types | Native types to Logical types | User defined native types

**Logical Types**

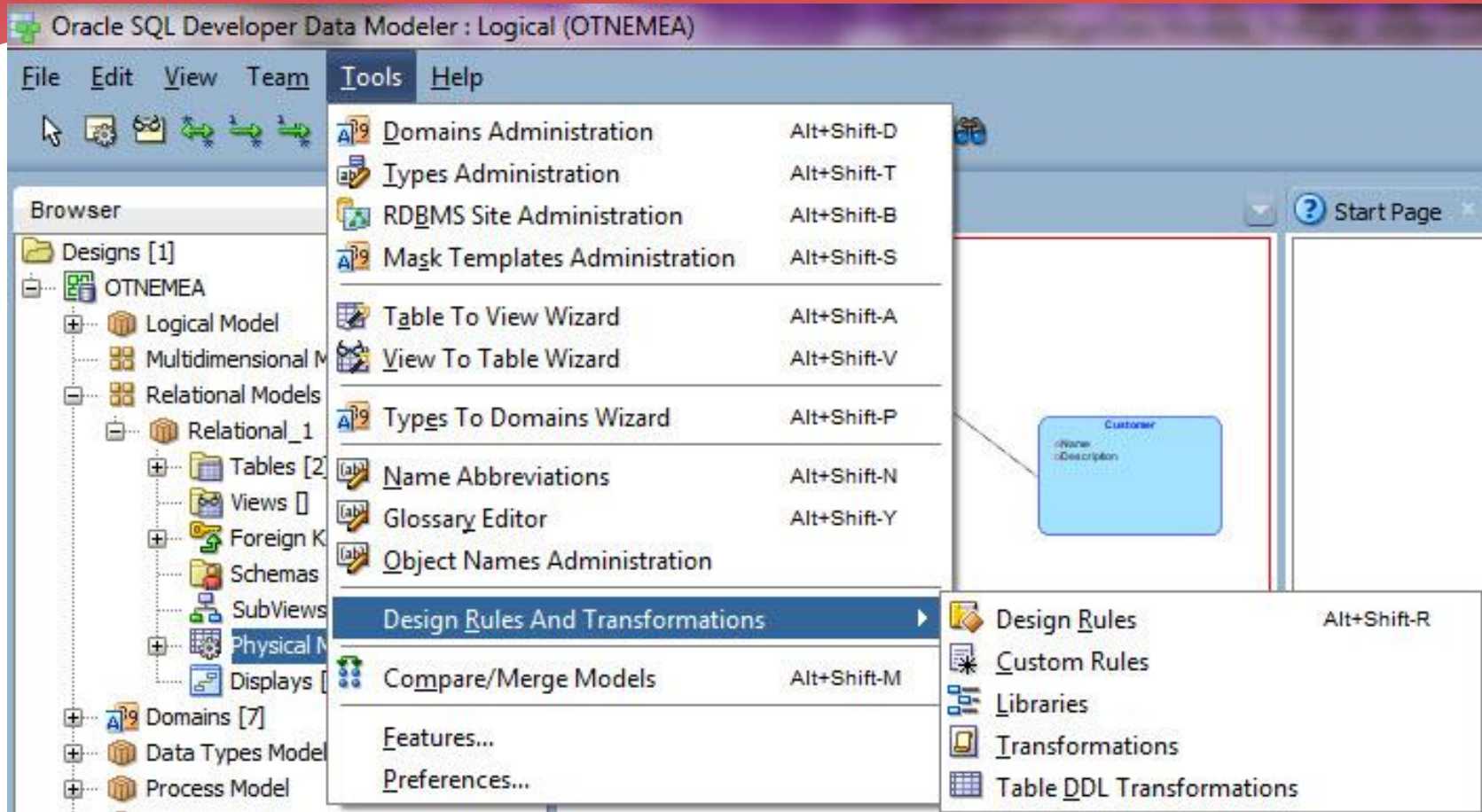
- unknown
- Audio
- BFile
- BIGINT
- BINARY
- BINARY DOUBLE
- BINARY FLOAT
- BIT
- BLOB
- Boolean
- CHAR
- CLOB
- DATALINK
- DBURIType
- DECIMAL
- DOUBLE
- Date
- Datetime
- FLOAT
- GRAPHIC
- HTTPURIType
- INTERVAL DAY TO SECOND
- INTERVAL YEAR TO MONTH
- Image
- Integer
- Long Char

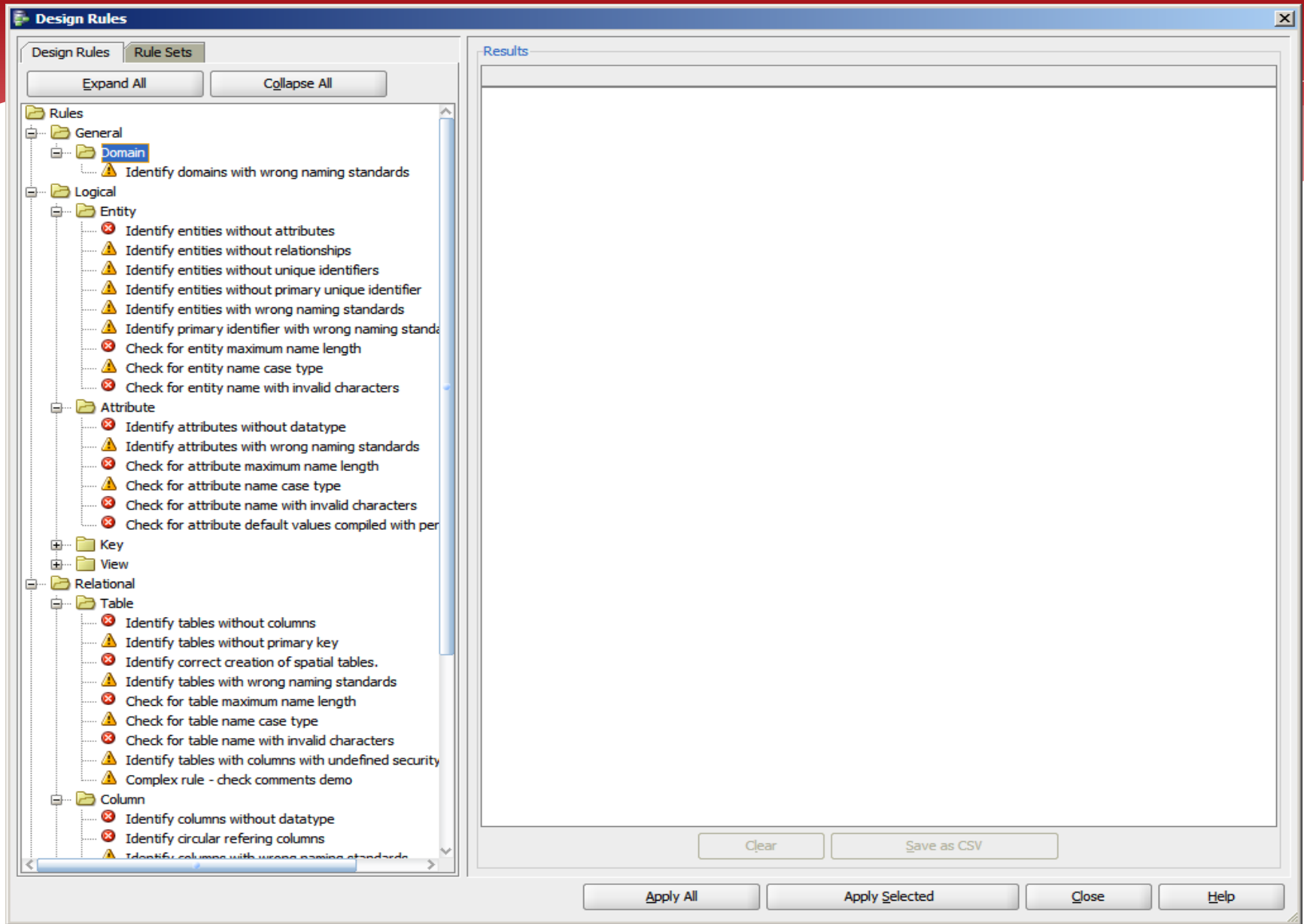
**Logical Type mappings**

Name:

Oracle Database 11g	BFILE	<input type="checkbox"/> Precision	<input type="text"/>	<input type="checkbox"/> Scale	<input type="text"/>	<input type="checkbox"/> Size	<input type="text"/>
Oracle Database 10g	BFILE	<input type="checkbox"/> Precision	<input type="text"/>	<input type="checkbox"/> Scale	<input type="text"/>	<input type="checkbox"/> Size	<input type="text"/>
Oracle9i	BFILE	<input type="checkbox"/> Precision	<input type="text"/>	<input type="checkbox"/> Scale	<input type="text"/>	<input type="checkbox"/> Size	<input type="text"/>
SQL Server 2005	BIGINT	<input type="checkbox"/> Precision	<input type="text"/>	<input type="checkbox"/> Scale	<input type="text"/>	<input type="checkbox"/> Size	<input type="text"/>
SQL Server 2000	BIGINT	<input type="checkbox"/> Precision	<input type="text"/>	<input type="checkbox"/> Scale	<input type="text"/>	<input type="checkbox"/> Size	<input type="text"/>
DB2/390 8	BINARY LARGE OBJECT	<input type="checkbox"/> Precision	<input type="text"/>	<input type="checkbox"/> Scale	<input type="text"/>	<input type="checkbox"/> Size	<input type="text"/>
DB2/390 7	BINARY LARGE OBJECT	<input type="checkbox"/> Precision	<input type="text"/>	<input type="checkbox"/> Scale	<input type="text"/>	<input type="checkbox"/> Size	<input type="text"/>
DB2/UDB 8.1	BIGINT	<input type="checkbox"/> Precision	<input type="text"/>	<input type="checkbox"/> Scale	<input type="text"/>	<input type="checkbox"/> Size	<input type="text"/>
DB2/UDB 7.1	BIGINT	<input type="checkbox"/> Precision	<input type="text"/>	<input type="checkbox"/> Scale	<input type="text"/>	<input type="checkbox"/> Size	<input type="text"/>

# Design Rules





**Design Rules**

Design Rules | Rule Sets

Expand All | Collapse All

- Rules
  - General
  - Logical
  - Relational
  - Process Model
  - Physical

**Results**

ERRORS:4WARNINGS:13

- Warning: Customer: Table has columns with undefined security properties
- Error: Customer: no comments in RDBMS defined , no comments defined
- Warning: Order: Table has columns with undefined security properties
- Error: Order: no comments in RDBMS defined , no comments defined
- Warning: OrderLine: Table has columns with undefined security properties
- Error: OrderLine: no comments in RDBMS defined , no comments defined
- Warning: Product: Table has columns with undefined security properties
- Error: Product: no comments in RDBMS defined , no comments defined
- Warning: Customer.Customer\_PK: Primary key with wrong naming standards is not recommended.
- Warning: Order.Order\_PK: Primary key with wrong naming standards is not recommended.
- Warning: Order.Relation\_2: Foreign keys with wrong naming standards are not recommended.
- Warning: OrderLine.OrderLine\_PK: Primary key with wrong naming standards is not recommended.
- Warning: OrderLine.Relation\_4: Foreign keys with wrong naming standards are not recommended.
- Warning: OrderLine.Relation\_6: Foreign keys with wrong naming standards are not recommended.
- Warning: Product.Product\_PK: Primary key with wrong naming standards is not recommended.
- Warning: Order: The name is a reserved word: Order
- Warning: Order: The name is a reserved word: Order

Clear | Save as CSV

Apply All | Apply Selected | Close | Help

# Different Compares

- \* Design vs Design
- \* Design vs Database
- \* Database vs Design

# Different Compares, Designs

- \* File | Import | Data Modeler Design
  - \* Compares "everything"
- \* Tools | Compare/Merge Models
  - \* Compares only relational and physical models
  - \* ALTER DDLs can be generated
- \* These can be used for instance to compare different versions of the design from version control

# Different Compares, Database

- \* Synchronize Model With Data Dictionary
  - \* Target: model
- \* Synchronize Data Dictionary With Model
  - \* Target: database
- \* File | Import | DDL File
- \* File | Import | Data Dictionary

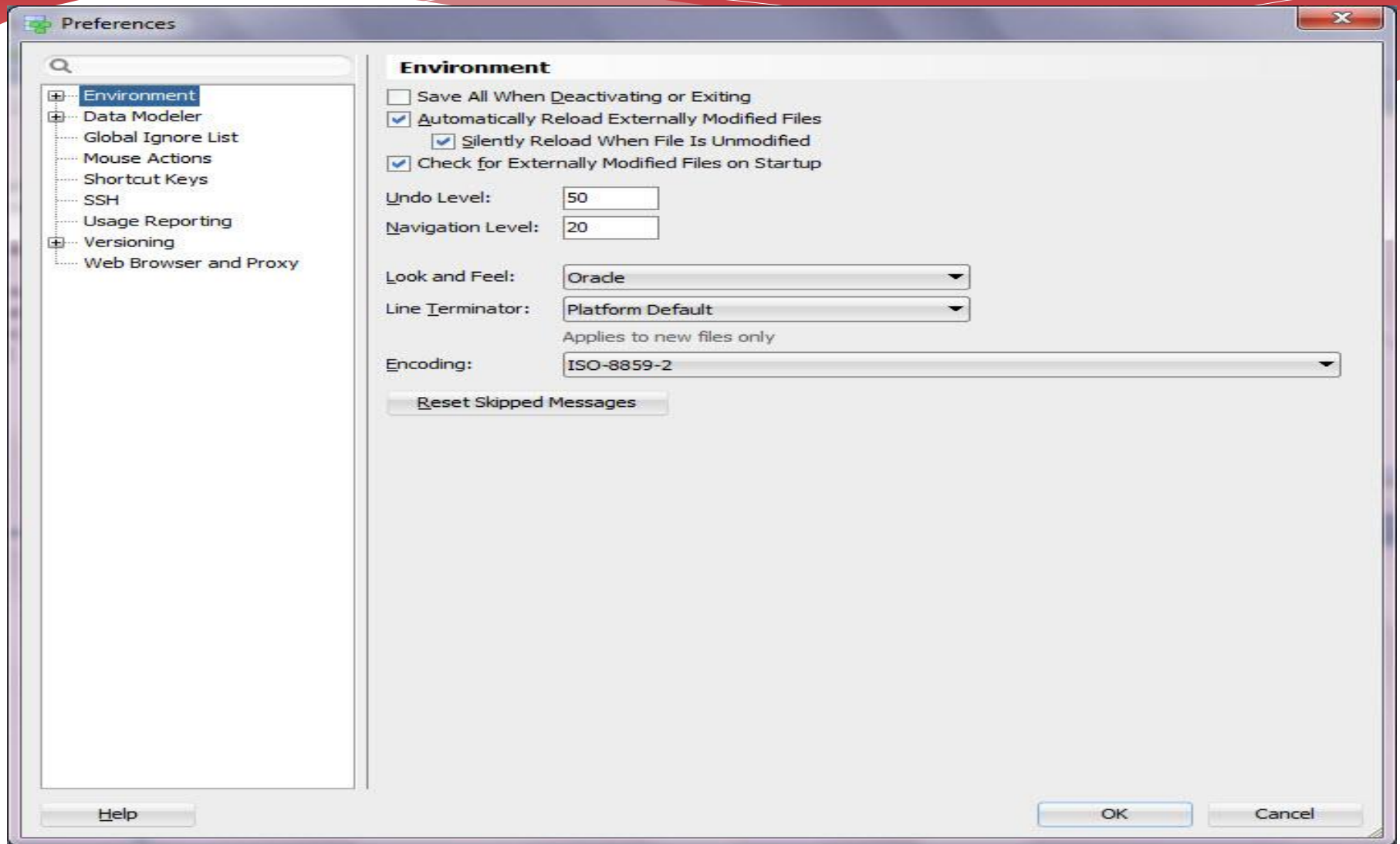
# Preferences

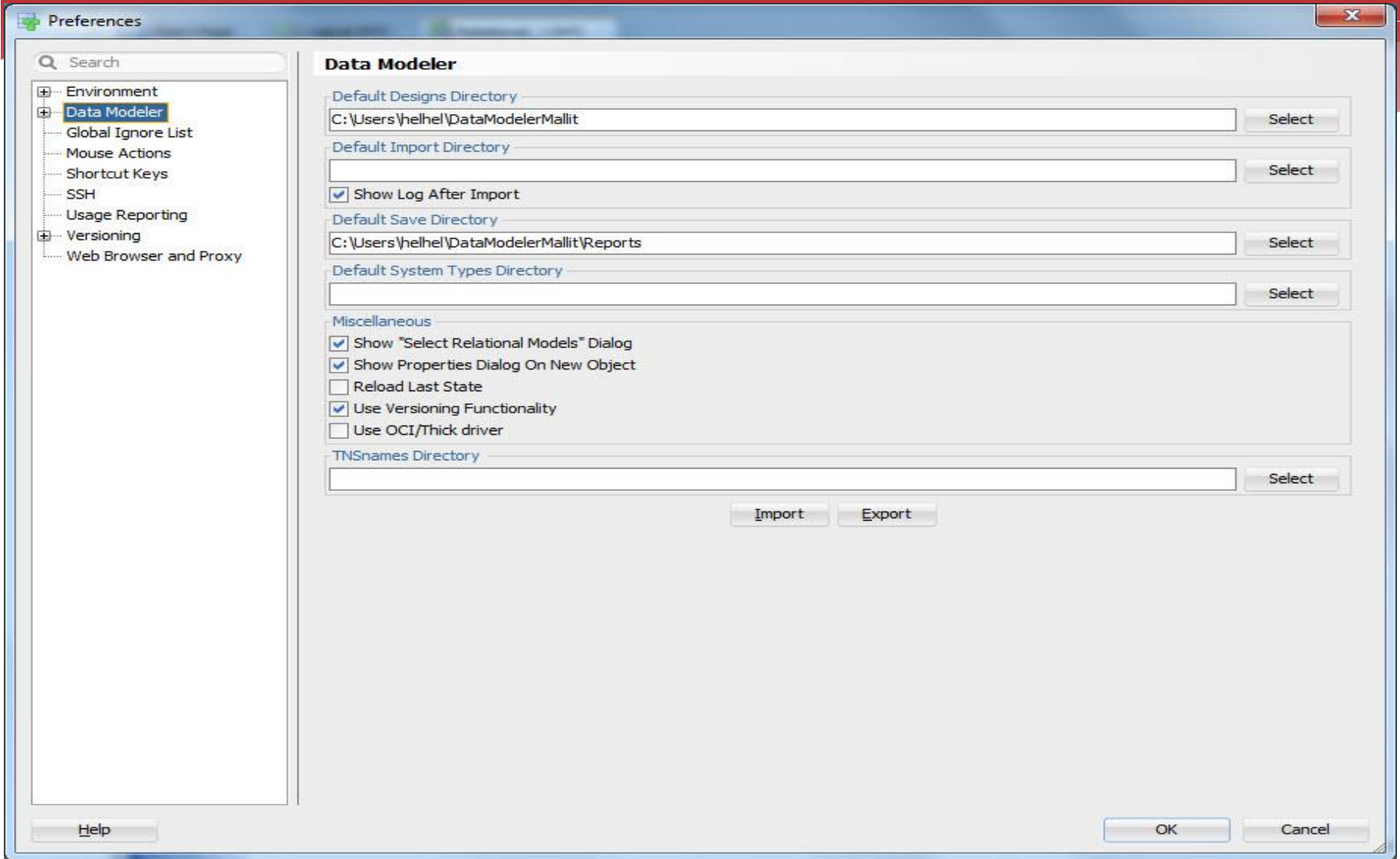
The screenshot displays the Oracle SQL Developer Data Modeler interface. The main workspace shows a logical model with four tables: Order, Customer, OrderLine, and Product. The Order table has columns OrderNo (NUMBER), OrderDate (DATE), and CustomerNo (NUMBER). The Customer table has columns CustomerNo (NUMBER), Name (VARCHAR), DeliveryAddress (VARCHAR), and MailAddress (VARCHAR). The OrderLine table has columns OrderlineNo (NUMBER (10)), Pcs (NUMBER), OrderNo (NUMBER), and ProductNo (NUMBER (10)). The Product table has columns ProductNo (NUMBER (10)) and ProductName (VARCHAR2). Relationships are shown: Order is linked to Customer via Order\_PK (OrderNo), OrderLine is linked to Order via Order\_PK (OrderNo), and OrderLine is linked to Product via Product\_PK (ProductNo).

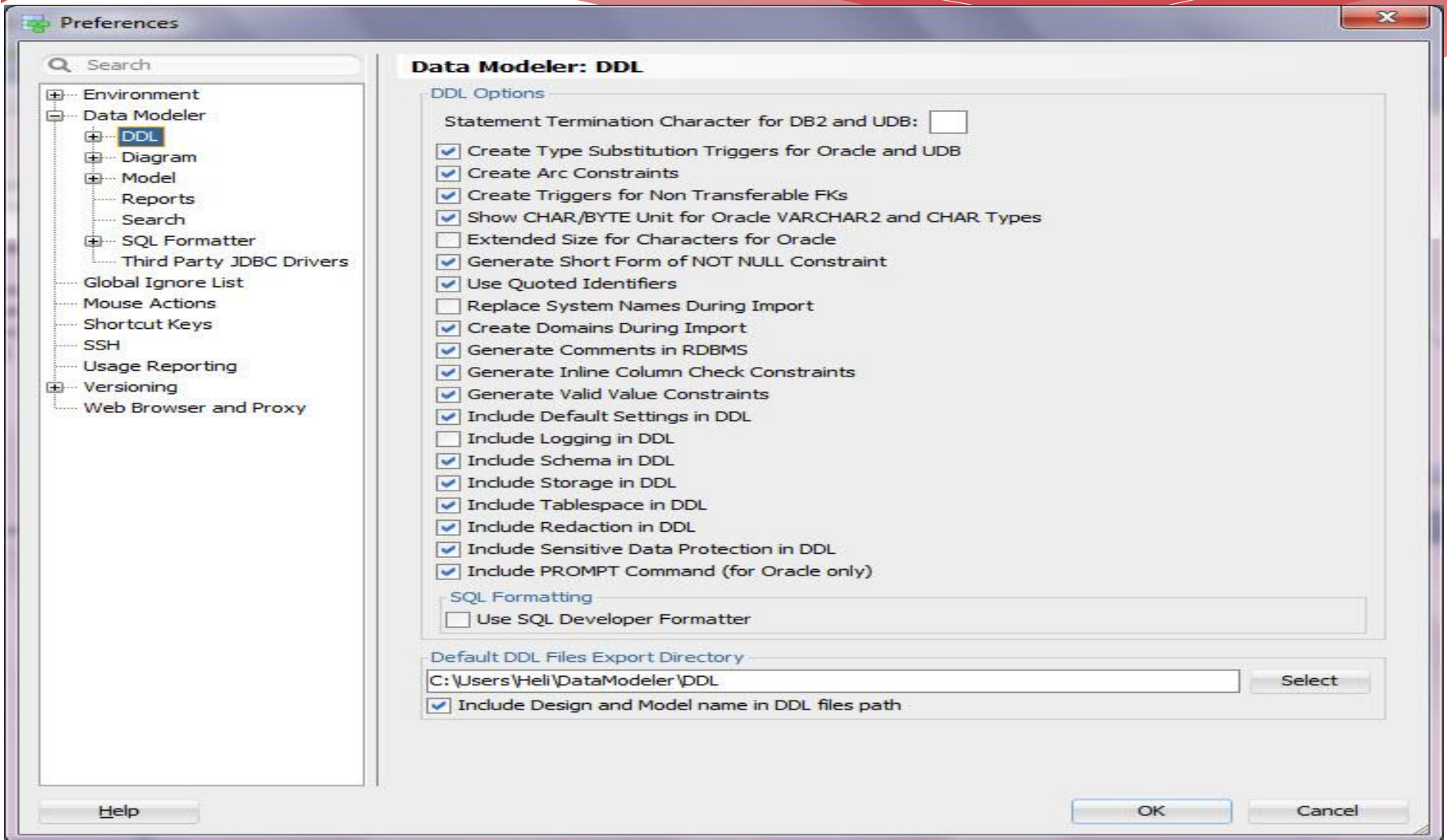
The Tools menu is open, showing various options including Domains Administration, Types Administration, RDBMS Site Administration, Table To View Wizard, View To Table Wizard, Types To Domains Wizard, Name Abbreviations, Glossary Editor, Design Rules, and Compare/Merge Models. The Preferences... option is highlighted.

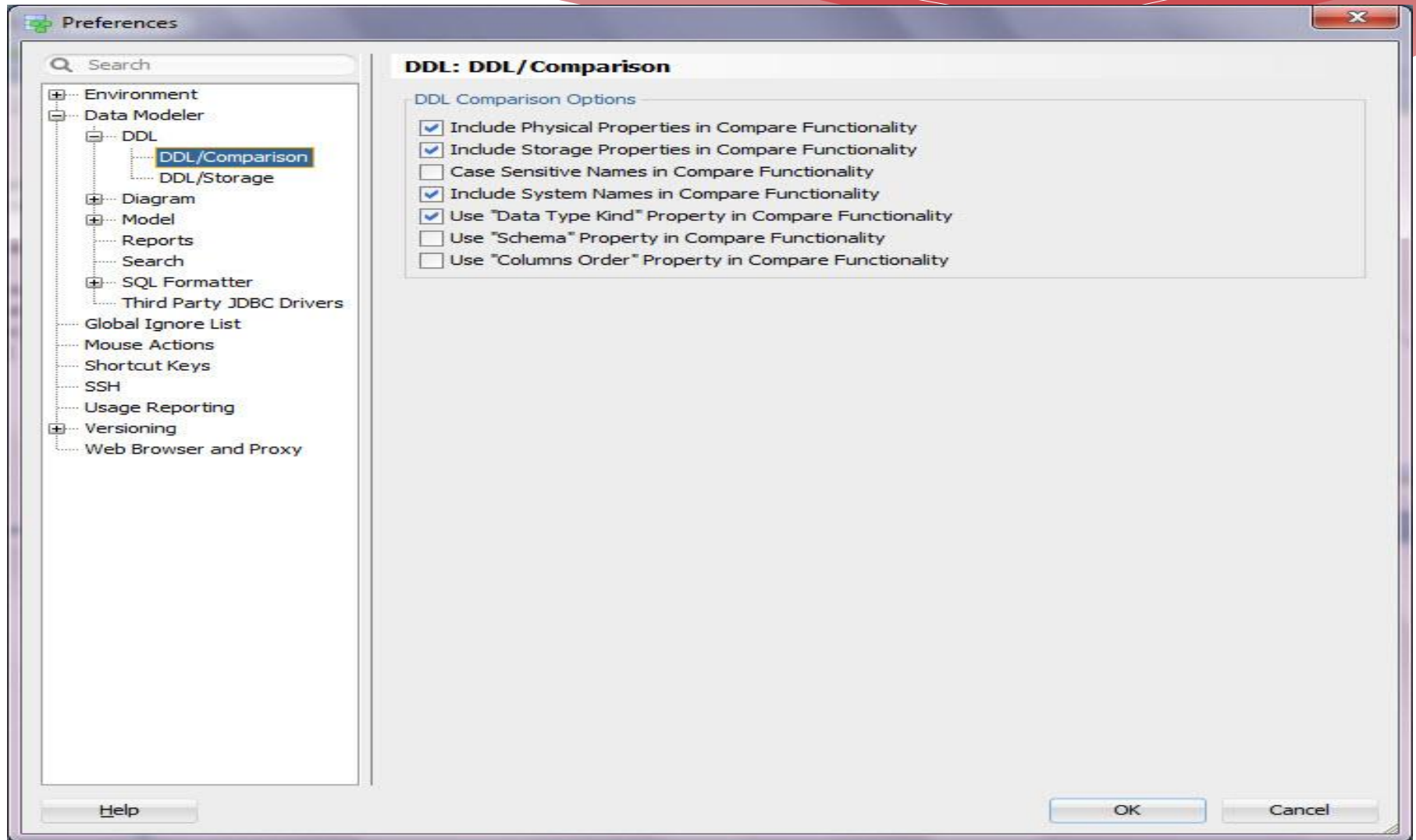
The Versing Navigator shows a Subversion design directory with branches, tags, and trunk. The Messages - Log and Pending Changes panes are also visible.

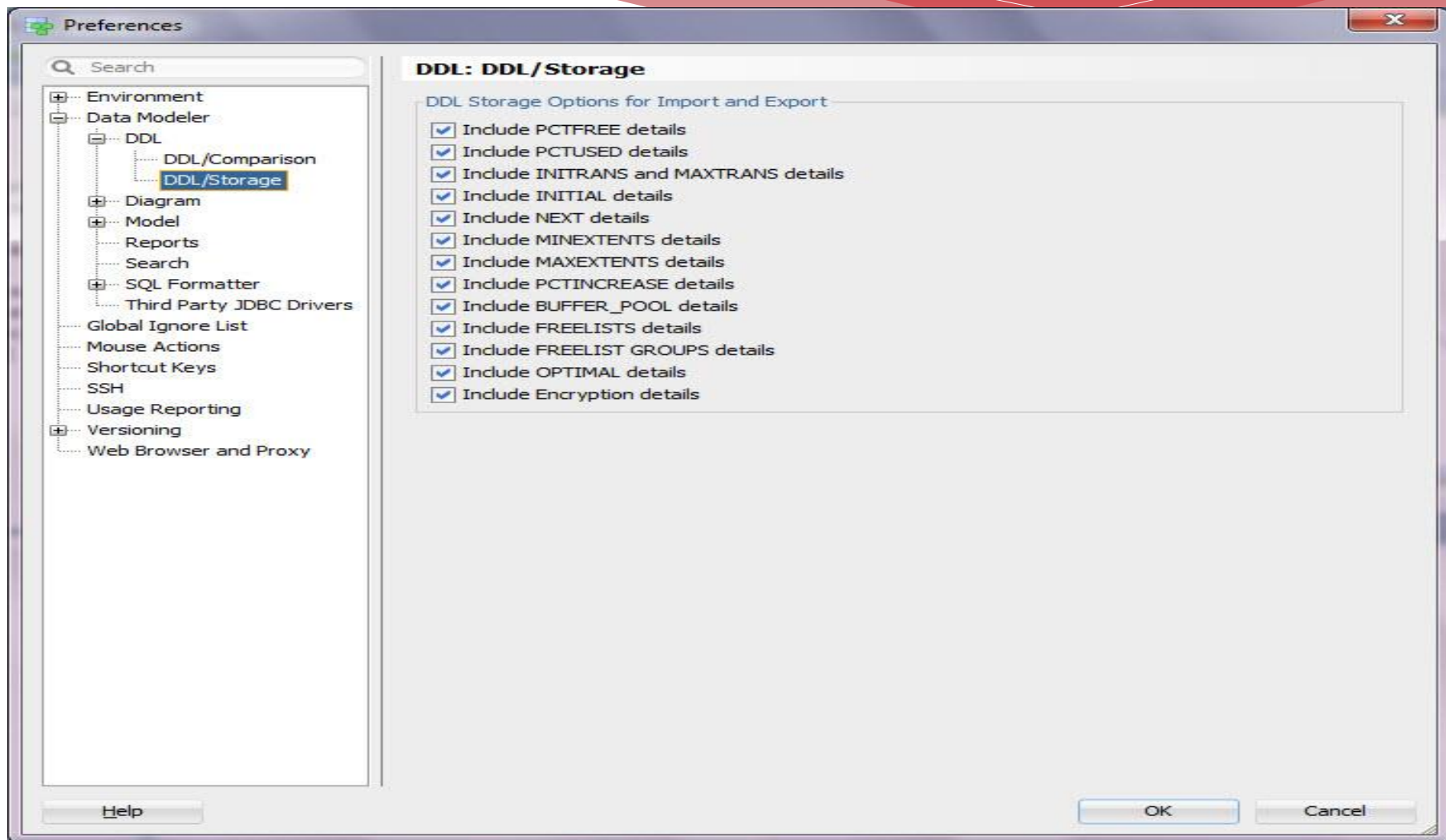


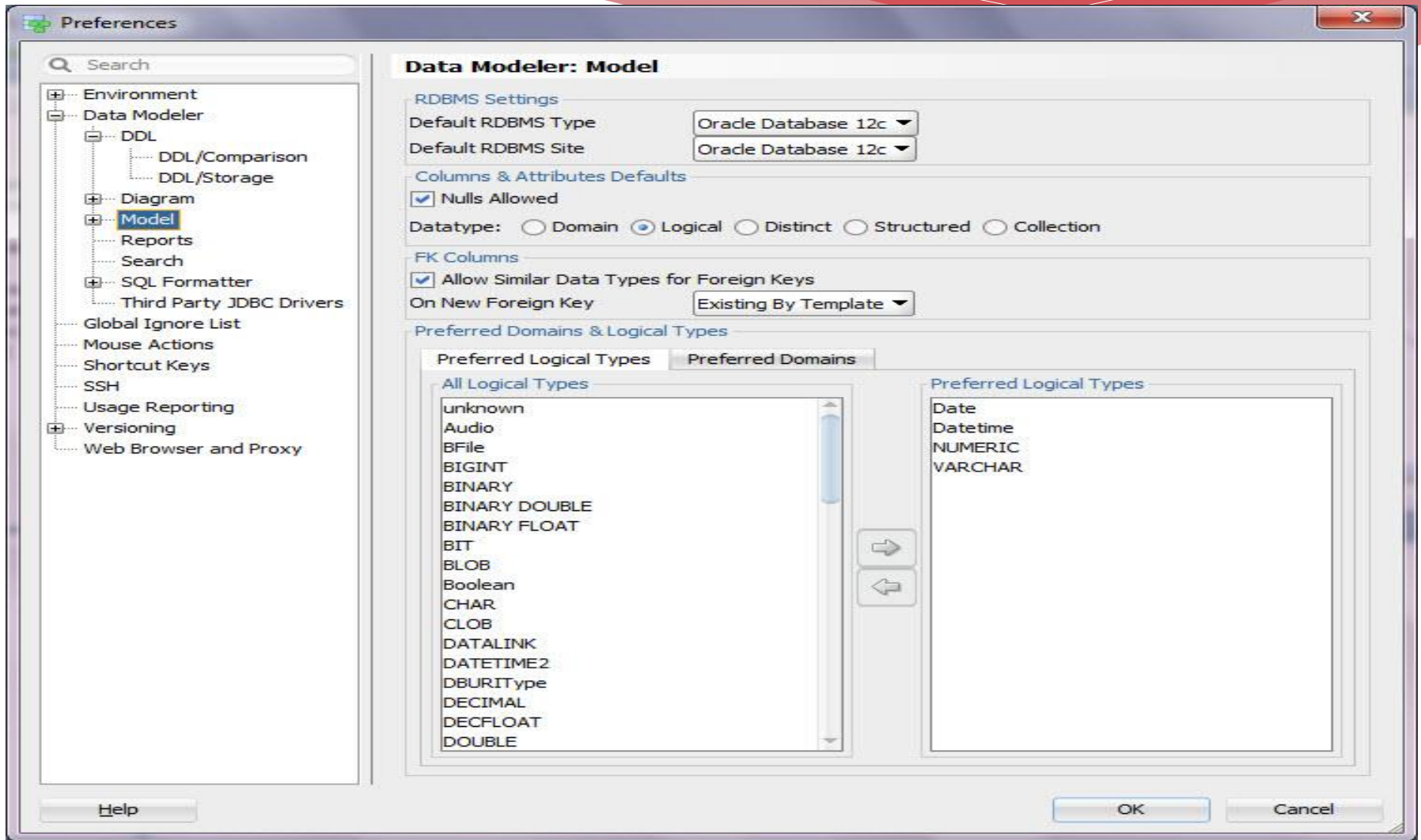


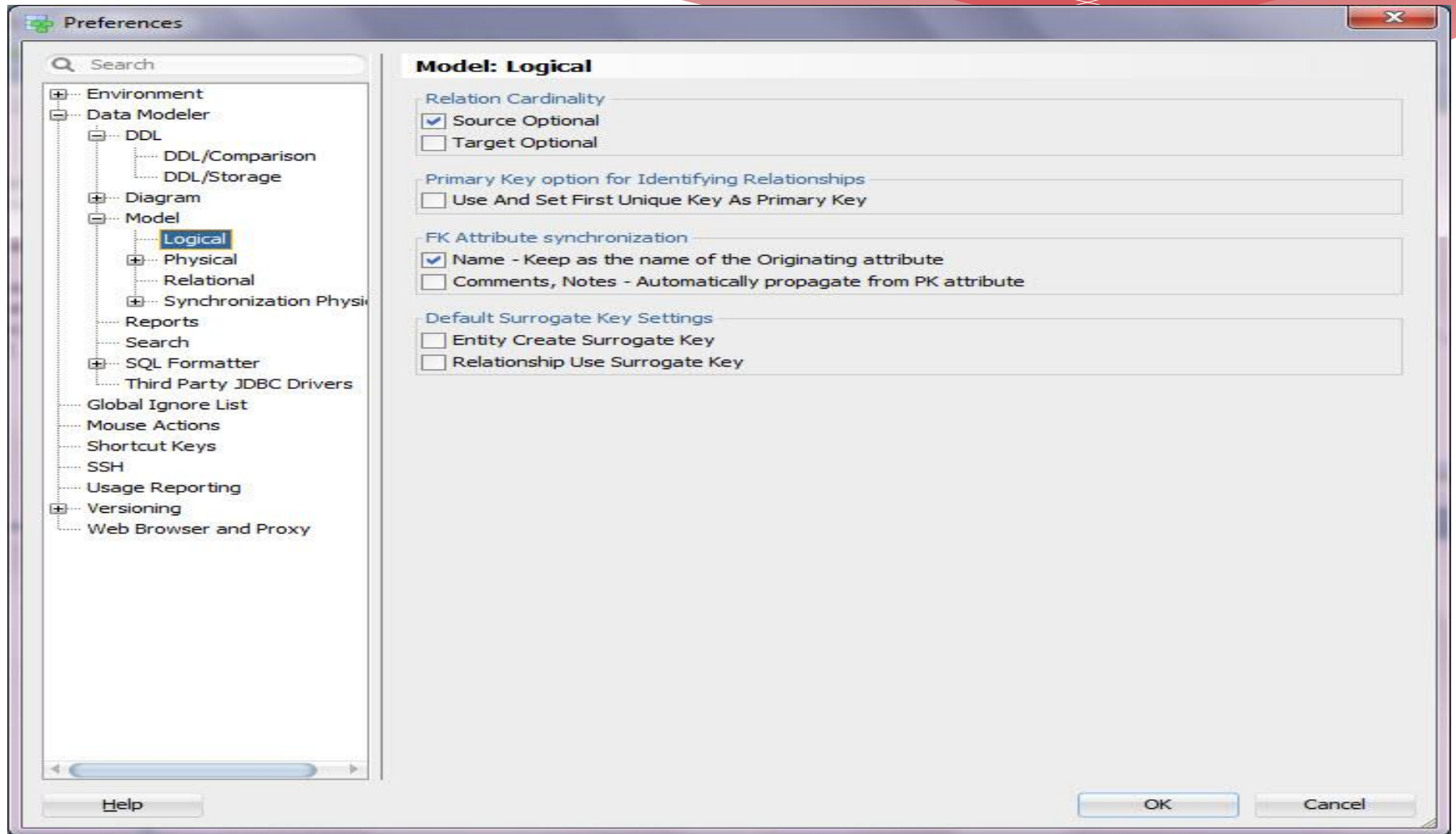


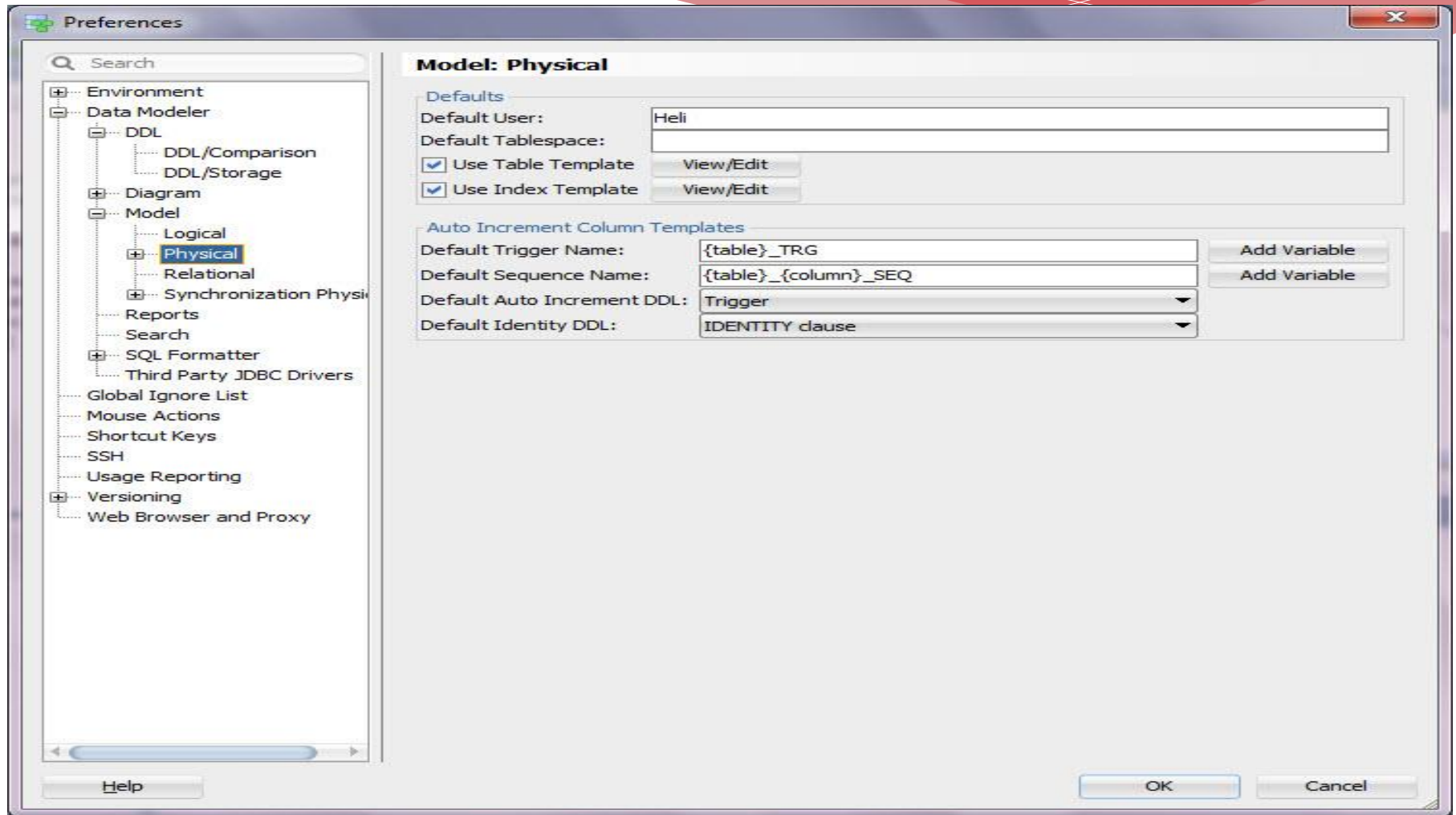






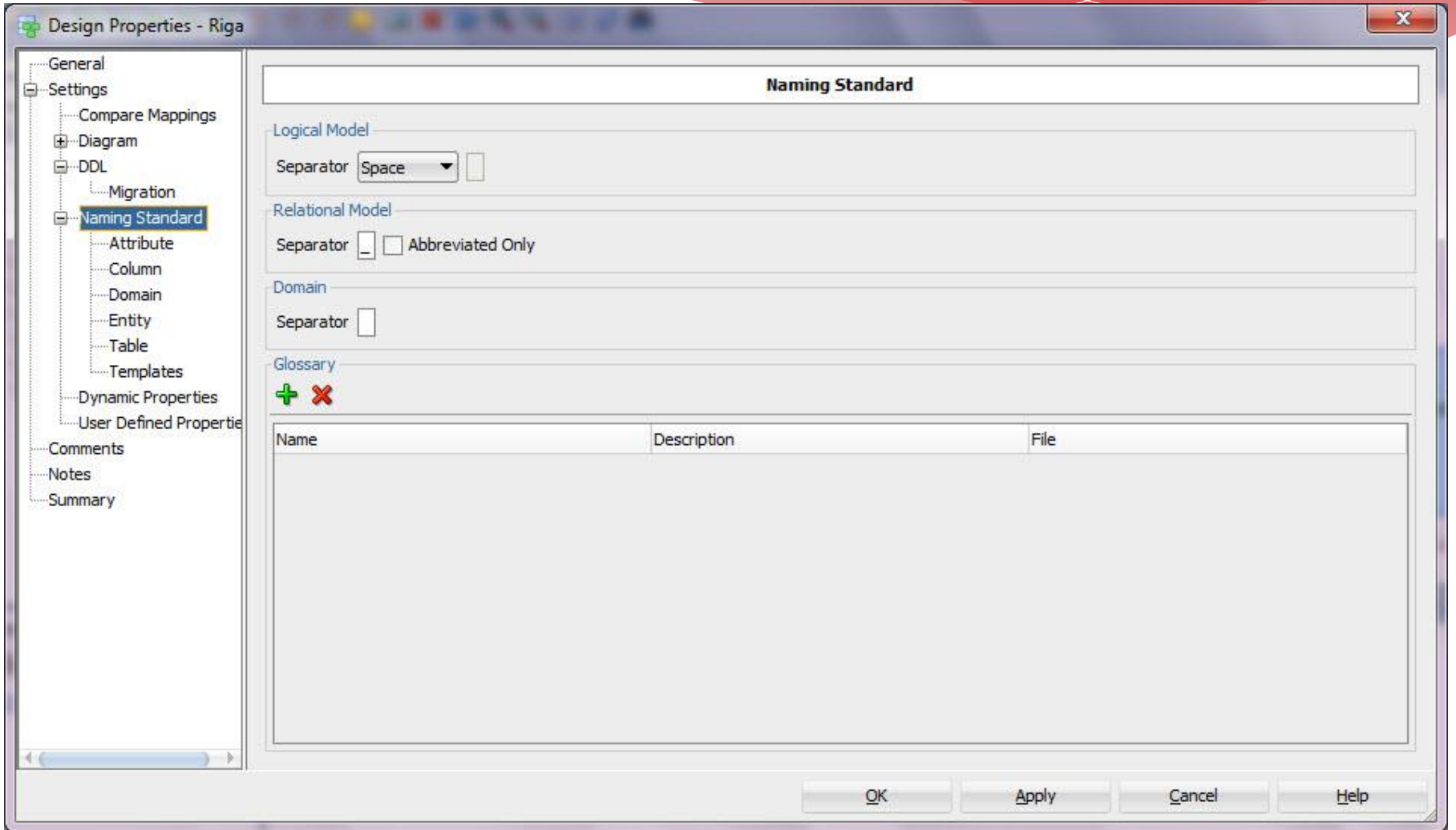


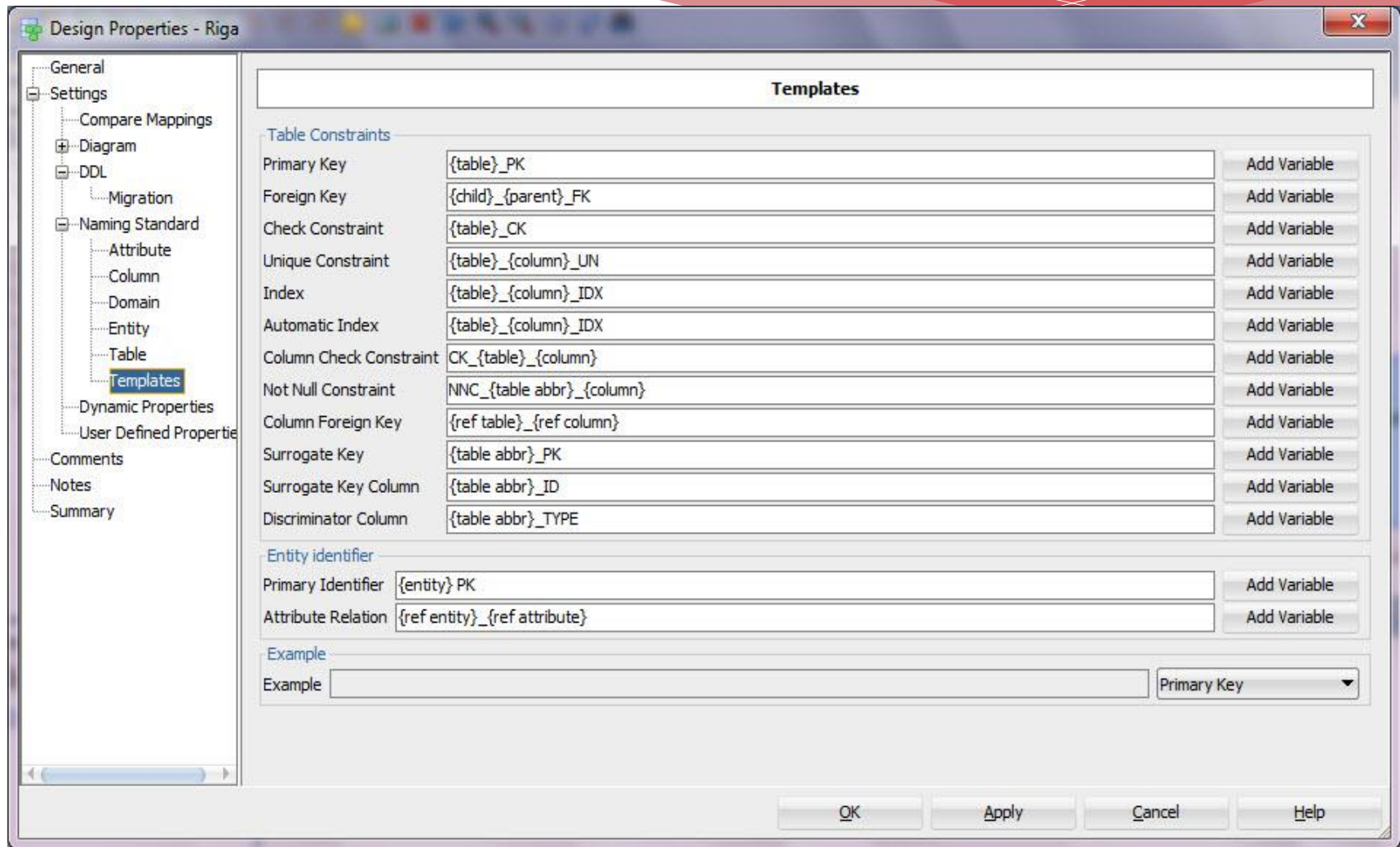




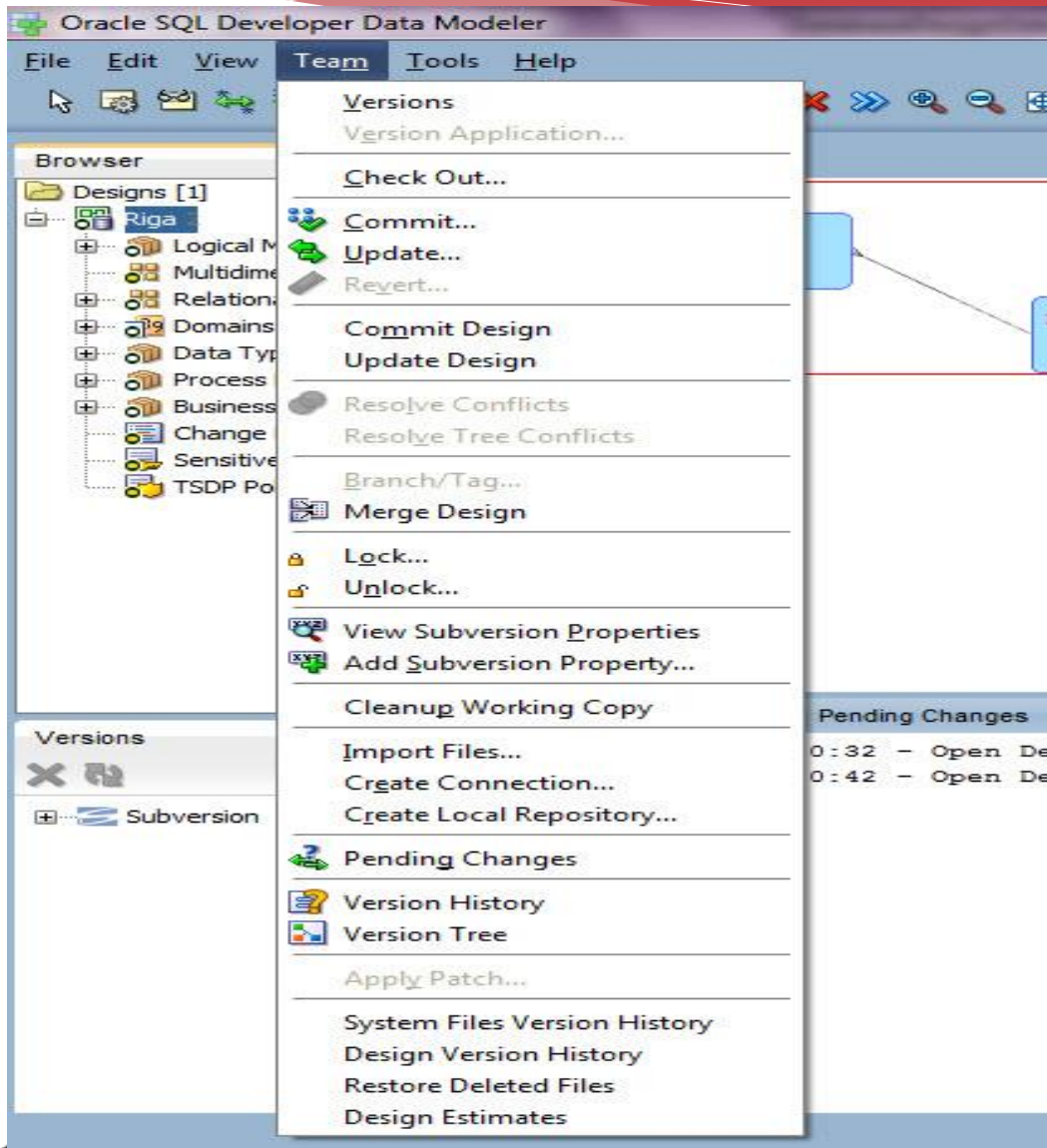


# Design Properties





# Version control (Subversion)



Oracle SQL Developer Data Modeler

File Edit View Versioning Tools Help

Browser x

Start Page x Logical (Orderdb) x Relational\_1 (Orderdb) x

Designs [1]  
Orderdb  
Logical Model  
Entities [4]  
Customer  
Order  
OrderLine  
Product  
ProductNo  
ProductName  
Description  
Primary Keys [1]  
Alternate Keys []  
Relations [1]  
Inheritance From Supertype []  
Inheritations To Subtypes []  
Relations [3]  
Inheritations []  
Views []  
SubViews []  
Displays []  
Multidimensional Models []  
Relational Models [1]  
Domains [3]  
Data Types Model  
Process Model  
Business Information  
Change Requests []

Relational\_1

Order

P *	OrderNo	NUMBER
	OrderDate	DATE
F *	CustomerNo	NUMBER
Order_PK (OrderNo)		

Customer

P *	CustomerNo	NUMBER
	Name	VARCHAR
	DeliveryAddress	VARCHAR
	MailAddress	VARCHAR
	ContactPerson	VARCHAR
Customer_PK (CustomerNo)		

OrderLine

P *	OrderlineNo	NUMBER (10)
	Pos	NUMBER
	Price	NUMBER (15,2)
PF *	OrderNo	NUMBER
F *	ProductNo	NUMBER (10)

Product

P *	ProductNo	NUMBER (10)
	Product Name	VARCHAR2
	Description	VARCHAR2
Product_PK (ProductNo)		

Versioning Navigator x

Subversion

Messages - Log x Pending Changes x

Orderdb (C:\ohjelmat\DataModeler\mallit\DesignsDirectory\...)

Orderdb  
Logical  
Entities  
Product [113]  
Customer [113]  
Relational Models  
mapping

Incoming Changes: 0 Outgoing Changes: 5 Unversioned Files: 0

Editing

**XML Metadata Comparator**

Filter

**Product (Last Synchronized (Local))**

- Complex Properties
  - attributes
    - (0) ProductNo
    - Complex Properties
    - (1) ProductName
    - TO DELETE**
- identifiers
- fonts

**Product (Local Saved)**

- Complex Properties
  - attributes
    - (0) ProductNo
    - Complex Properties
    - (1) ProductName
    - Description**
- identifiers
- fonts

**Details**

Property	Selected		
name	<input checked="" type="checkbox"/>		Description
id	<input checked="" type="checkbox"/>		B23C918F-BAE4-590E-3A31-BB36CAA16...
ownerDesignName	<input checked="" type="checkbox"/>		Orderdb
nullsAllowed	<input checked="" type="checkbox"/>	false	true
useDomainConstraints	<input checked="" type="checkbox"/>	true	false
Data Type Kind	<input checked="" type="checkbox"/>		Logical Type
logicalDatatype	<input checked="" type="checkbox"/>	LOGDT017	VARCHAR / LOGDT024
dataTypeSize	<input checked="" type="checkbox"/>		200
createdBy	<input checked="" type="checkbox"/>		helskyaho_h
createdTime	<input checked="" type="checkbox"/>		2012-09-27 11:14:08 UTC

Merge Close Help

Oracle SQL Developer Data Modeler

File Edit View Versingning Tools Help

Start Page x Logical (Orderdb) x Relational\_1 (Orderdb) x

Browser x

- Designs [1]
  - Orderdb
    - Logical Model
      - Entities [4]
        - Customer
        - Order
        - OrderLine
        - Product
          - ProductNo
          - ProductName
          - Description
      - Primary Keys [1]
        - Alternate Keys []
      - Relations [1]
        - Inheritance From Supertype []
        - Inheritances To Subtypes []
    - Relations [3]
      - Inheritances []
      - Views []
      - SubViews []
      - Displays []
    - Multidimensional Models []
    - Relational Models [1]
      - Domains [3]
        - Data Types Model
        - Process Model
        - Business Information
        - Change Requests []

Order

P *	OrderNo	NUMBER
	OrderDate	DATE
F *	CustomerNo	NUMBER
Order_PK (OrderNo)		

Customer

P *	CustomerNo	NUMBER
	Name	VARCHAR
	DeliveryAddress	VARCHAR
	MailAddress	VARCHAR
	ContactPerson	VARCHAR
Customer_PK (CustomerNo)		

OrderLine

P *	OrderlineNo	NUMBER (10)
	Pcs	NUMBER
	Price	NUMBER (15)
PF *	OrderNo	NUMBER
F *	ProductNo	NUMBER (10)
OrderLine_PK (OrderlineNo, Or		

Product

P *	ProductNo	NUMBER (10)
	ProductName	VARCHAR2
	Description	VARCHAR2
Product_PK (ProductNo)		

Versioning Navigator x

SVN Console - Log x Pending Changes x

Orderdb (C:\ohjelmat\DataModeler mallit\DesignsDirectory\...)


Orderdb Commit...

Incoming Changes: 0 Outgoing Changes: 1 Unversioned Files: 0

Editing



**Commit Resources**

Name ▲	Location	Status	Select
 Customer	Logical \ Entities	M	<input checked="" type="checkbox"/>

Keep Locks

Comments:

Template or Previous Comments:

<Select>

This list is configured with [comment templates](#)

# Conclusions

- \* To be able to connect to the database, to see its content online and to maintain the data: **SQL Developer**
- \* To *design* the database and to maintain the data structures: **Data Modeler**
- \* To *design* the data architecture: **Data Modeler**

# Conclusions

- \* Data Modeler is a good tool; good support for iterative processes
- \* Enables documenting and versioning (and comparing the versions)
- \* Enables multiuser environment
- \* Is free to use
- \* Support for other databases as well
- \* I see no reason not to use it!

# THANK YOU!

QUESTIONS?

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