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Data Modeling Tools (Available only in Navicat Premium and Enterprise Version)



Model is a powerful tool for creating and manipulating database models. Some of key features are listed here:

- Create and manipulate a model graphically.
- Reverse engineer a database/schema or table(s) to a model.
- Forward engineer a model to a sql file or database/schema.
- Create and edit table structures directly.

Just simply click  to open an object pane for **Model**. A right-click displays the popup menu or using the object pane toolbar, allowing you to create new, edit and delete the selected model.

Create Model

To create a new model

- Select anywhere on the object pane.
- Click the  **New Model** from the object pane toolbar.
or
- Right-click and select  **New Model** from the popup menu.
- Edit model properties in the Model Designer.

To create a new model using reverse engineering




- Open a database/schema.
- Select the database/schema from the navigation pane or select the table(s) from the navigation pane/object pane.
- Right-click the database/schema/table(s) and select **Reverse Database to Model.../Reverse Tables to Model...** from the popup menu.
- Edit model properties in the Model Designer.

To create a new model with the same properties as one of the existing models has

- Select the model(s) for copying in the object pane.
- Right-click and select the **Copy** from the popup menu.
- Select anywhere on the object pane.
- Right-click and select the **Paste** from the popup menu.



- The newly created model(s) will be named as "modelname - **Copy**".

To create a new model with modification as one of the existing models

- Select the model for modifying in the object pane.
- Right-click and select the  **Design Model** from the popup menu.
or
- Click the  **Design Model** from the object pane toolbar.
- Modify model properties in the Model Designer.
- Click  **Save As**.

Edit Model

To edit the existing model



- Select the model for editing in the object pane.
- Right-click and select the  **Design Model** from the popup menu.
or
- Click the  **Design Model** from the object pane toolbar.
- Edit model properties in the Model Designer.

To change the name of the model

- Select the model for editing in the object pane.
- Right-click and select the **Rename** from the popup menu.

Delete Model

To delete a model

- Select the model for deleting in the object pane.
- Right-click and select the  **Delete Model** from the popup menu.
or
- Click the  **Delete Model** from the object pane toolbar.
- Confirm deleting in the dialog window.

Achieve Model Information

To achieve a model information

- Select the model in the object pane.
- Right-click the selected model and choose **Object Information** from the popup menu.
or
- Choose View -> Object Information in the main menu.

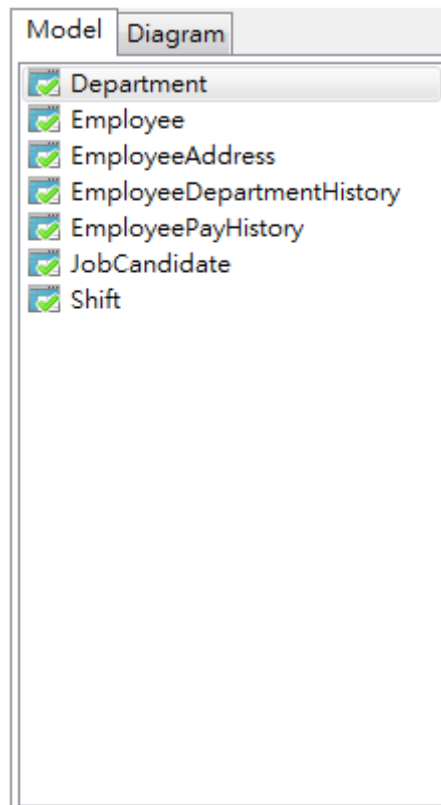
Model Designer

Model Designer is the basic Navicat tool for working with model. It allows you to create, edit, delete, print model and etc.

- [Model Tree Palette](#)
- [Diagram Tree Palette](#)
- [Model Diagram Palette](#)
- [Properties Palette](#)
- [History Palette](#)
- [Model Preview and Print](#)

Model Tree Palette

Model Tree holds all the tables in the model, including the tables used in each individual diagram. By default, it is located on the left sidebar. To show/hide the sidebar, simply choose View -> **Sidebar** from the main menu.



Create Table

To create a new table

- Select anywhere in the model tree.
- Right-click and select **New Table** from the popup menu.

Edit Table

To edit the existing table

- Right-click the table in the model tree and select **Design Table** from the popup menu.
- Edit table properties and fields on the appropriate tabs.

To change the name of the table

- Select the table for editing in the model tree.
- Right-click and select the **Rename** from the popup menu.

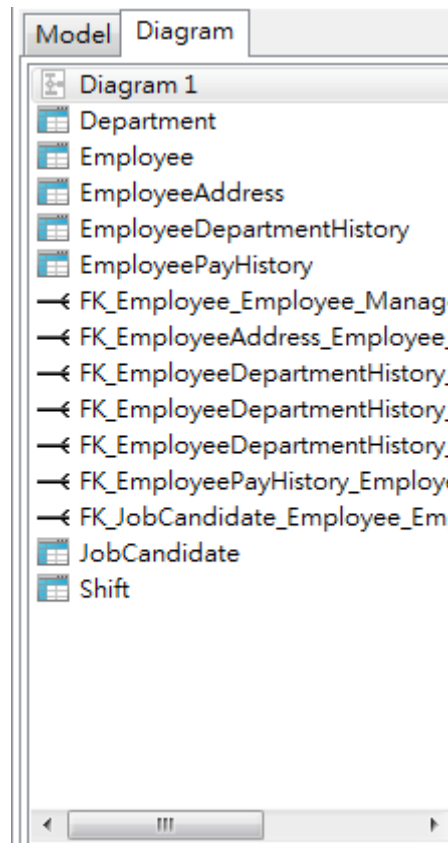
Delete Table

To delete a table

- Select the table for deleting in the model tree.
- Right-click and select the **Delete Table** from the popup menu.
- Confirm deleting in the dialog window.

Diagram Tree Palette

Diagram Tree holds all the objects (tables, layers, notes, images and relations) added to the active diagram. By default, it is located on the left sidebar. To show/hide the sidebar, simply choose View -> **Sidebar** from the main menu.



Create Object

To create a new object

- Select anywhere in the diagram tree.
- Right-click and select **New** from the popup menu.
- Choose the object.

Edit Object

To edit the existing table

- Right-click the table in the diagram tree and select **Design Table** from the popup menu.
- Edit table properties and fields on the appropriate tabs.

To change the name of the object

- Select the object for editing in the diagram tree.
- Right-click and select the **Rename** from the popup menu.

Delete Object

To delete a table from the diagram

- Select the table for deleting in the diagram tree.
- Right-click and select the **Delete -> from Diagram** from the popup menu.
- Confirm deleting in the dialog window.


To delete a table/relation from the model and diagram

- Select the table/relation for deleting in the diagram tree.
- Right-click and select the **Delete -> from Diagram and Model** from the popup menu.
- Confirm deleting in the dialog window.

To delete a layer/note/image from the diagram


- Select the object for deleting in the diagram tree.
- Right-click and select the **Delete** from the popup menu.
- Confirm deleting in the dialog window.

Model Diagram Palette

Model Diagram Palette is a canvas for you to design the diagram. Simply click the  **New Diagram** from the toolbar to create a new diagram.

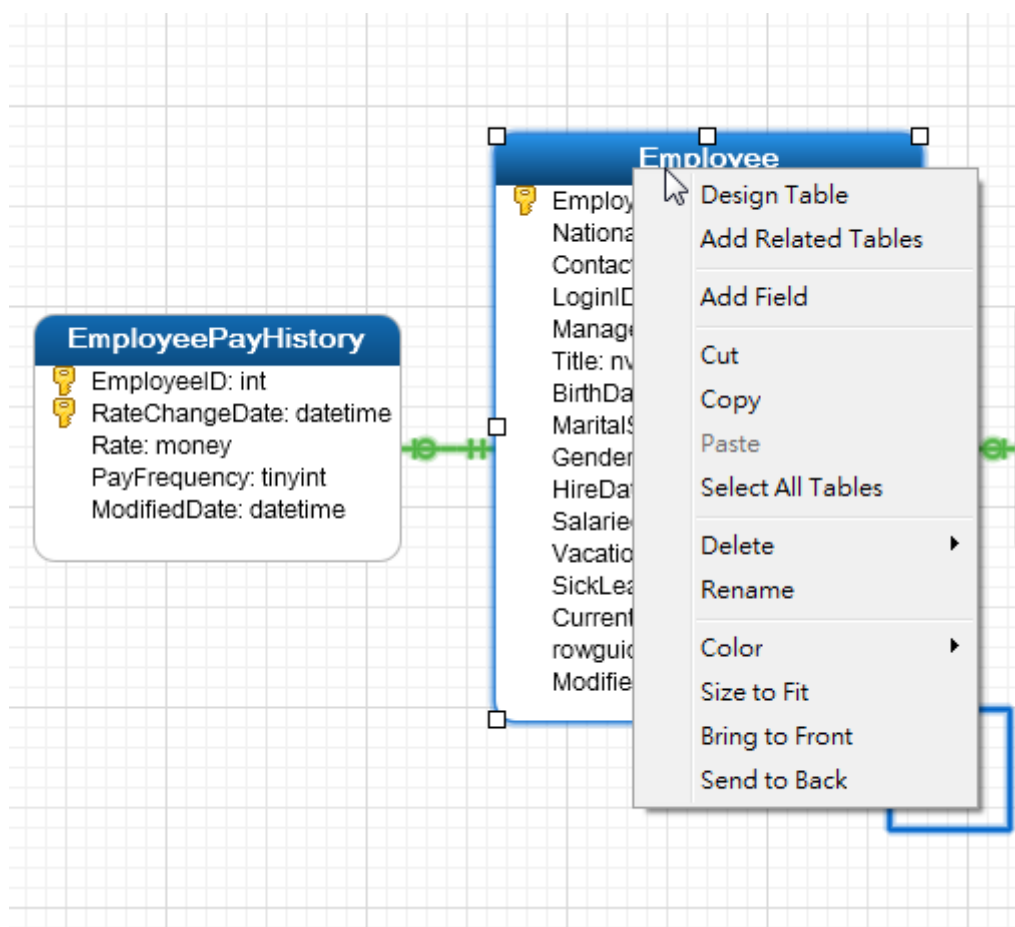
- [Creating Tables](#)
- [Creating Layers](#)
- [Creating Notes and Labels](#)
- [Creating Images](#)
- [Creating Relations](#)
- [Formatting Diagram](#)

Creating Tables

To create a new table, click the  button from the diagram toolbar and click anywhere on the canvas.

To add an existing table from the model tree to the diagram, simply drag and drop the table from model tree to the canvas.

Note: If you right-click a field in a table, you can choose to add, insert, delete, rename field and set the field as primary key.



The popup menu options of the table object in canvas include:

Design Table

Edit the table structure in a designer, e.g. fields, indexes, foreign keys, etc.

Note: The tabs and options in the designer depend on the diagram database type you are chosen. For the settings of different tabs, see Database Object Management.

Add Related Tables

Add all related tables to the selected table.

Add Field

Add fields to the existing table.

Cut

Remove the table from the diagram and put it on the clipboard.

Copy

Copy the table from the diagram to the clipboard.

Paste

Paste the content from the clipboard into the diagram.

Select All Tables

Select all the tables in the diagram.

Delete

Delete a table from the diagram or from both diagram and model.

Rename

Change the name of the table.

Color

Change the color of the table.

Size to Fit

Resize the table automatically to fit its contents.

Bring to Front


Bring table to the foreground.

Send to Back

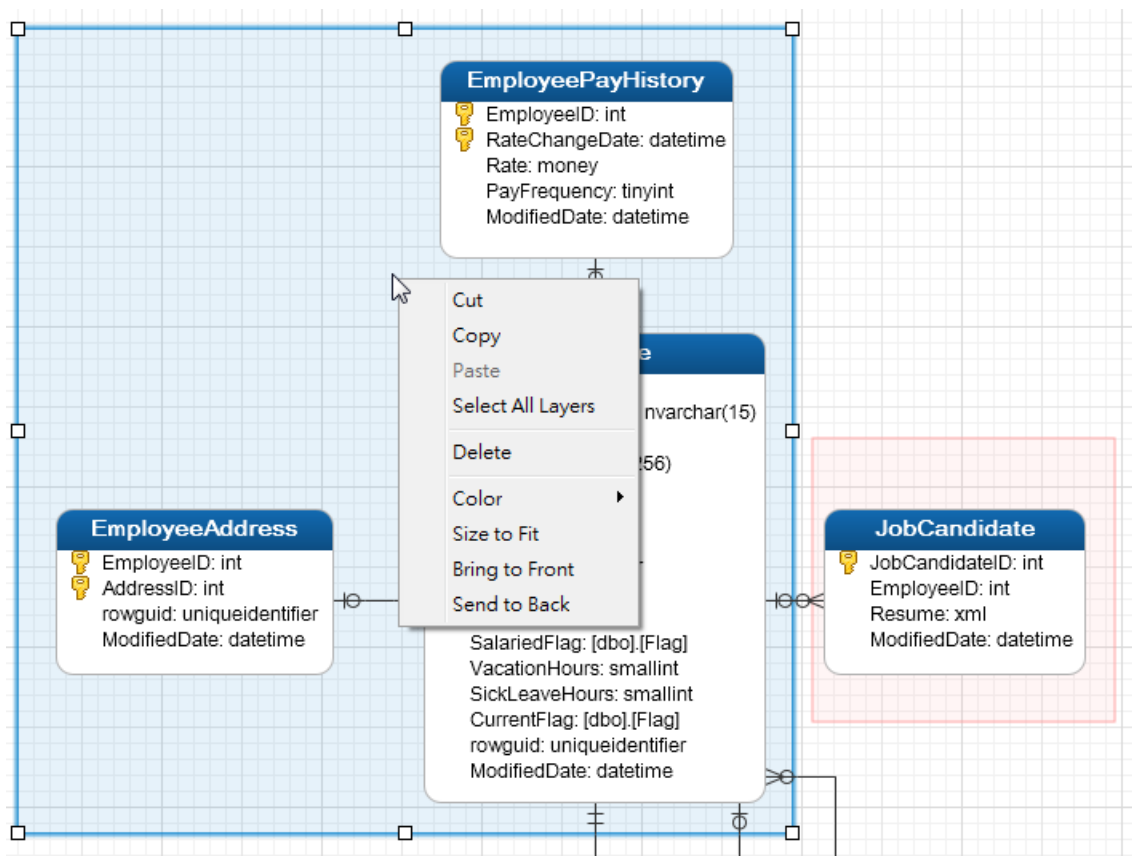
Move table to the background.

Creating Layers

Layers are used to help organize objects (e.g. tables, notes, images, etc) on the canvas. You can add all related objects to the same layer. For example, you may choose to add all your sales related tables to one layer.

To create a new layer, click the  button from the diagram toolbar and click anywhere on the canvas.

You can put any objects on top of the layer.



The popup menu options of the layer object in canvas include:

Cut

Remove the layer from the diagram and put it on the clipboard.

Copy

Copy the layer from the diagram to the clipboard.

Paste

Paste the content from the clipboard into the diagram.

Select All Layers

Select all the layers in the diagram.

Delete

Delete a layer from the diagram.

Color

Change the color of the layer.

Size to Fit

Resize the layer automatically to fit its contents.

Bring to Front


Bring layer to the foreground.

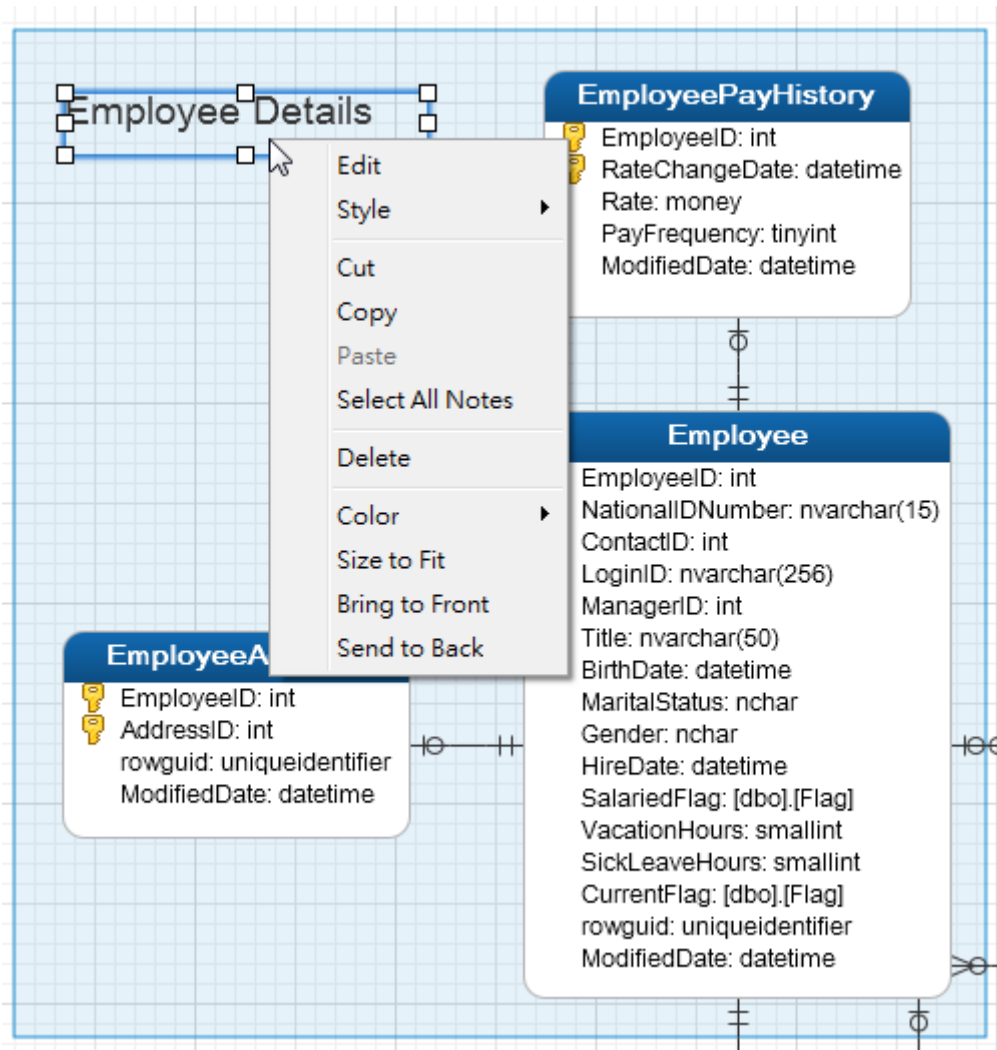
Send to Back

Move layer to the background.

Creating Notes and Labels

Notes or Labels are typically used to help document the diagram design process. For example, to explain a grouping table objects.

To create a new note or label, click the  button from the diagram toolbar and click anywhere on the canvas.



The popup menu options of the note object in canvas include:

Edit

Change the content of the note.

Style

Choose the style of the note: Note or Label.

Cut

Remove the note from the diagram and put it on the clipboard.

Copy

Copy the note from the diagram to the clipboard.

Paste

Paste the content from the clipboard into the diagram.

Select All Notes

Select all the notes in the diagram.

Delete

Delete a note from the diagram.

Color

Change the color of the note.

Size to Fit

Resize the note automatically to fit its contents.


Bring to Front

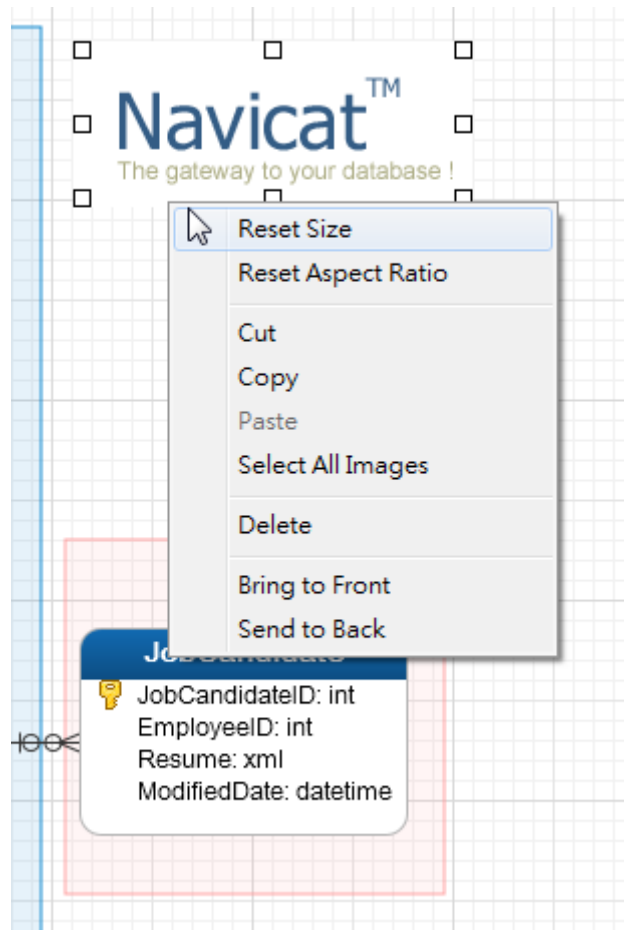
Bring note to the foreground.

Send to Back

Move note to the background.

Creating Images

To create a new image, click the  button from the diagram toolbar and click anywhere on the canvas.



The popup menu options of the image object in canvas include:

Reset Size

Reset the size of the image to its original size.

Reset Aspect Ratio

Maintain image original width to height ratio.

Cut

Remove the image from the diagram and put it on the clipboard.

Copy

Copy the image from the diagram to the clipboard.

Paste

Paste the content from the clipboard into the diagram.

Select All Images

Select all the images in the diagram.

Delete

Delete a image from the diagram.


Bring to Front

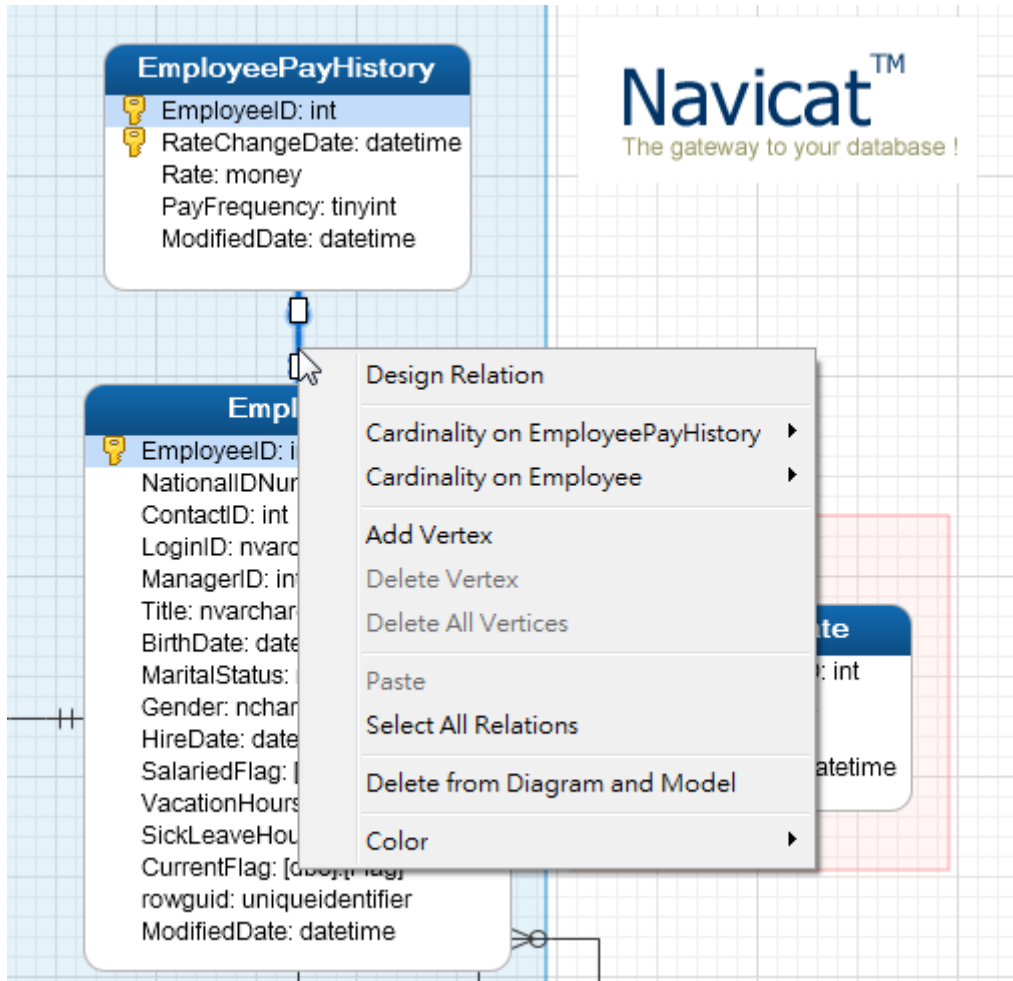
Bring image to the foreground.

Send to Back

Move image to the background.

Creating Relations

To add a relation, click the  button from the diagram toolbar and drag and drop a field from one table to another.



The popup menu options of the relation object in canvas include:

Design Relation

Edit the relation in a designer.

Note: The options in the designer depends on the diagram database type you are chosen. For the settings, see Database Object Management.

Cardinality on table_name1

Set the cardinality on table_name1: None, One and Only One, Many, One or Many, Zero or One, Zero or Many.

Cardinality on table_name2

Set the cardinality on table_name2: None, One and Only One, Many, One or Many, Zero or One, Zero or Many.

Add Vertex

Add a vertex on a relation connector.

Delete Vertex

Delete a vertex on a relation connector.

Delete All Vertices

Delete all vertices on a relation connector.

Paste

Paste the content from the clipboard into the diagram.

Select All Relations

Select all the relations in the diagram.

Delete from Diagram and Model

Delete a relation from the diagram and model.

Color

Change the color of the relation.

Formatting Diagram

Show Grid

To turn the grid on in the diagram canvas, choose View -> **Show Grid** from the main menu.

Snap To Grid

To align objects on the canvas with the grid, choose View -> **Snap To Grid** from the main menu.

Change Database Type

To change the database type of the diagram, choose Model -> **Database** and select the type from the main menu. Choose **Generic** if you do not decide the database type.

Change Diagram Notation

To change the notation of the diagram, choose Model -> **Diagram Notation** and select the notation from the main menu.

Default

The default notation style used in Navicat.

Simple

A simple notation style. The table objects will only show the name.

Crow's Foot

Crow's Foot notation style.

IDEF1X

The ICAM DEFinition language information modeling method.

UML

Universal Modeling Language style.


Black and White

Change the color of the diagram to black and white.

Change Diagram Dimensions

To change the number of pages used in the diagram, choose Model -> **Diagram Dimensions...** from the main menu and set the Width and Height.

Apply Auto Layout

To automatically arrange objects on the canvas, click  **Auto Layout** from the toolbar. To change the Auto Layout, simply choose Tools -> **Auto Layout with...** from the main menu and set the options.

Auto Diagram Dimension

Choose the suitable diagram dimension automatically.

Auto Size Tables to Fit

Resize the table to fit its content automatically.

Quality

The quality of the auto layout output.

Object Distance

The distance between the objects in the diagram.

Zoom In/Zoom Out

To zoom in or zoom out the selected area of the diagram, adjust the slider of the **Navigator**. If the Navigator is hidden, choose View -> **Navigator** from the main menu. Same effect can be achieved with keyboard shortcuts:

Zoom In: [Ctrl++] or [Ctrl+Mousewheel up]

Zoom out: [Ctrl+-] or [Ctrl+Mousewheel down]

Properties Palette

The **Properties** palette is used to display and edit the properties of diagram and its objects.

Black and White

Check this box to change the diagram color to black and white.

Bold

Check this box or press Ctrl+B to bold the table or relation.

Color

The color of the object.

Diagram Notation

The notation of the diagram. The value for this can be Default, Simple, IDEF1X, UML or Crow's Foot.

Font Bold

Check this box to bold the note font.

Font Color

The font color of the note.

Font Italic

Check this box to apply an italic style to the note font.

Font Name

The font name of the note.

Font Size

The font size of the note.

Height

The height of the object.

Height (pages)

The height of the diagram (number of papers).

Left

The number of pixels from the object to the left side of the canvas.

Name

The name of the object.

Opacity

The transparency of the image. The value for this can be between 0 to 100. Use 100 for opacity and 0 for transparent.

Referenced Cardinality

The relation cardinality of referenced (parent) table.

Referencing Cardinality

The relation cardinality of referencing (child) table.

Style

The style of the note. The value for this can be Note or Label.

Table Font Name

The font name of the tables.

Table Font Size

The font size of the tables.

Top

The number of pixels from the object to the top of the canvas.

Width

The width of the object.

Width (pages)


The width of the diagram (number of papers).

History Palette

The **History** palette shows all the actions that you have taken. Simply double-click a action to restore that state.

Model Preview and Print


Print Preview

To preview the pages before printing, simply click the  **Print Preview** button. The model can be printed to the printer or to various file formats.

Page Setup

Choose File -> **Page Setup** to change paper size, orientation and margins.

Print to a printer

Choose File ->  **Print** to send your diagram directly to the printer. You can set the printer option in the popup window.

Print to a file (PDF/PNG/SVG)

Choose File -> **Print As** -> **PDF/PNG/SVG** to create a PDF/PNG/SVG file of your diagram.

Export SQL

Export SQL allows exporting table structures in model into a SQL file.

- Select **Tools** -> **Export SQL...** from the main menu.
- Edit export properties on the appropriate tabs.
- Click **OK**.

General Settings for Export SQL

File

Set the output file name and location.

Tables

You are allowed to choose your preferable tables in model you wish to export.

Advanced Settings for Export SQL

Server Version

Select server version for the SQL file.

Include Schema (Available only for Oracle, PostgreSQL and SQL Server)

Includes entered schema name in file with this option is on. Otherwise, only table name is included in SQL statements.

Include Drop SQL

Includes drop table SQL statements in file with this option in on.

Include Drop with CASCADE (Available only for MySQL, Oracle and PostgreSQL)

Includes drop table SQL statements with cascade option in file with this option in on.

Include Primary Keys

Includes primary keys in file with this option is on.

Include Foreign Keys

Includes foreign keys in file with this option is on.

Include Uniques (Available only for Oracle, PostgreSQL, SQLite and SQL Server)

Includes uniques in file with this option is on.

Include indexes

Includes indexes in file with this option is on.

Include character set (Available only for MySQL)

Includes table and field character set in file with this option is on.

Include Collation (Available only for SQLite and SQL Server)

Includes table collation in file with this option is on.

Synchronize to Database

Navicat allows you to compare and modify the table structures with detailed analytical process. In other words, Navicat compares tables between the target databases/schemas and the model and states the differential in structure.

- Select **Tools** -> **Synchronize to Database...** from the main menu.
- Edit synchronization properties on the General tab.
- Click **Compare** to generate a set of scripts which shows the differentiation between the databases/schemas and the model.
- Select the scripts you want to run.
- Click **Run Query**.

General Settings for Synchronize to Database

The following instruction guides you through the process of setting up a synchronization. Customize options according to your needs.

Target

Defines connection, database and schema for the target.

Compare Options

Compare Identifier With Case Sensitive

Check this option if you want to compare table identifier with case sensitive option.

Compare Primary Keys

Check this option if you want to compare table primary keys.

Compare Foreign Keys

Check this option if you want to compare table foreign keys.

Compare Indexes

Check this option if you want to compare indexes.

Compare Character Set (Available only for MySQL)

Check this option if you want to compare character set of the tables.

Compare Uniques (Available only for Oracle, PostgreSQL, SQLite and SQL Server)

Check this option if you want to compare uniques.

Compare Collation (Available only for SQLite and SQL Server)

Check this option if you want to compare collation of the tables.

Execution Options

SQL for objects to be created

Check this option to include all related SQL statements if new objects will be created in the target database.

SQL for objects to be changed

Check this option to include all related SQL statements if objects will be changed in the target database.

SQL for objects to be dropped

Check this option to include all related SQL statements if objects will be dropped from the target database.

Continue on error

Ignores errors that are encountered during the synchronization process.

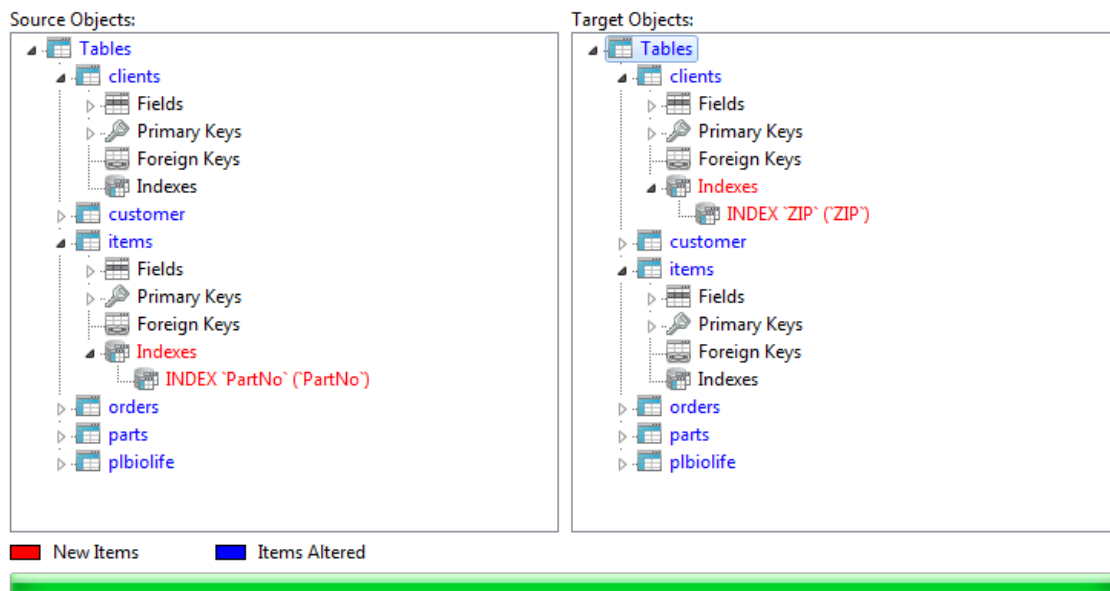
Synchronize to Database Result

Source Objects/Target Objects

The tree view shows the differentiation between the source model and target database/schema after the computation of the structure synchronization, providing with the detailed SQL statements shown in the **Queries for Modification** list.

The red item represents the non-existence for the other database/schema.

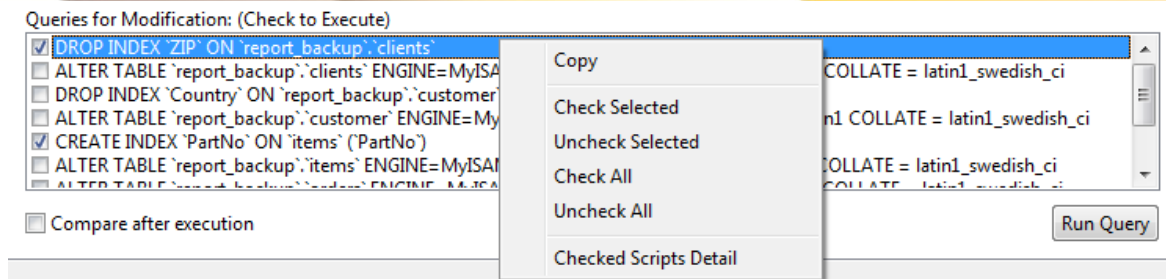
The blue item represents the existence for the other database/schema, but different definition detected.



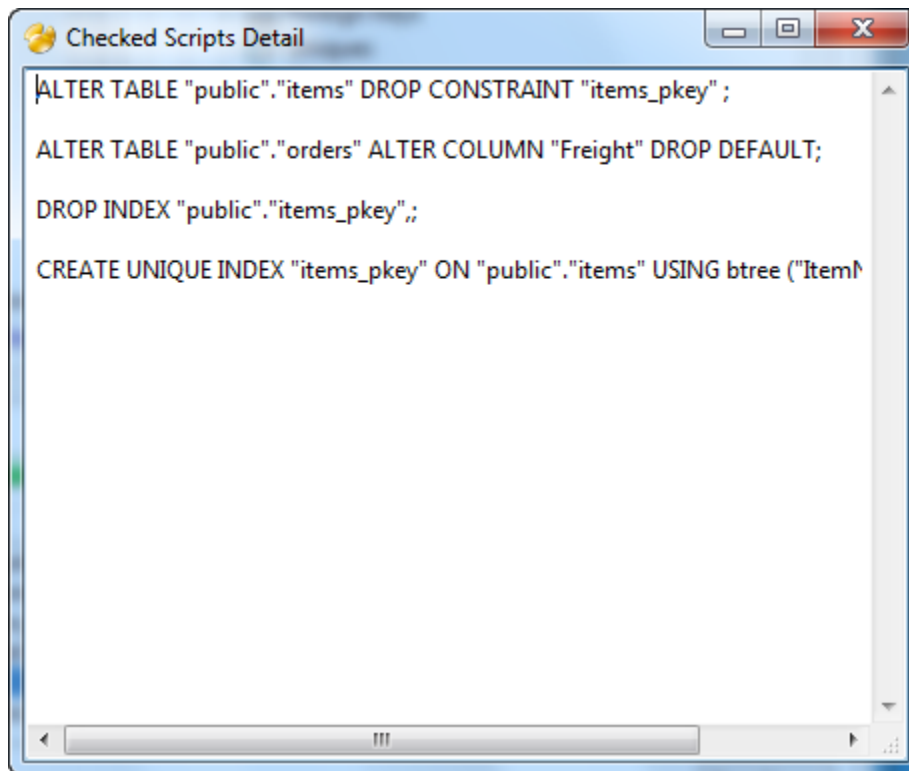
Queries for Modification

All the scripts are applied to the target database/schema and they are being unchecked in the **Queries for Modification** list by default. Just simply select the scripts you want to execute.

You can highlight multiple lines of scripts, and then right-click to show the pop-up menu. Choose **Copy** can copy the selected queries to preferred editor. Choose **Check Selected**, **Uncheck Selected**, **Check All** or **Uncheck All** so as to perform selection/unselection of scripts at one go.



To view the full SQL statements you selected, right-click the **Queries for Modification** list and select **Checked Scripts Detail**.



Compare after execution

Compares tables after the synchronization is executed.

Press **Run Query** to execute the selected query.

Synchronize to Database Message Log

The **Message Log** tab allows you to view the running process indicating success or failure.



Example:

```
[Msg] Starting Synchronization  
[Msg] Target Server : MySQL 5.1  
[Msg] Target Database : report_sample  
[Msg] Executing - ALTER TABLE `report_sample`.`orders` ADD CONSTRAINT  
`fk_orders_customer_1` FOREIGN KEY (`CustNo`) REFERENCES `customer` (`CustNo`)  
[Msg] Completed  
[Msg] Synchronization Completed
```

Model Hints and Tips

Navicat provides some useful hints to work on the model more effectively.

Action	Description
Locate Object in Model Diagram Palette	<ul style="list-style-type: none"> - Object selected in Diagram Tree will be highlighted in Model Diagram. - Double-click an object in Diagram Tree will jump to the corresponding object.
Delete Table from Model Tree Palette	<ul style="list-style-type: none"> - Select table in Model Diagram and press Shift + Delete.
Open Table Designer	<ul style="list-style-type: none"> - Double-click a table in Model Tree/Model Diagram.
Add table from Navicat Main	<ul style="list-style-type: none"> - Drag table from Navicat main window and drop to the Model Diagram.
Get Table Structure (SQL Statement)	<ul style="list-style-type: none"> - Select and copy the table in Model Diagram, and paste it to text editor, e.g. Notepad.
Design Field without Table Designer	<ul style="list-style-type: none"> - Select and click the table name and press Tab/Down Arrow to add/edit fields. <p>Navicat will predict field types according to field names you entered.</p> <p>INTEGER/int/int4/NUMBER</p> <ul style="list-style-type: none"> - suffix "id", "no" (if it is the first column, it will be predicted as a primary key) - suffix "num" - "qty", "number" - exactly "age", "count" <p>DECIMAL(10,2)/decimal(10,2)/NUMBER/REAL/money</p> <ul style="list-style-type: none"> - suffix "price", "cost", "salary" <p>FLOAT/double/float8/NUMBER/REAL/float</p> <ul style="list-style-type: none"> - "size", "height", "width", "length", "weight", "speed", "distance" <p>DATE/datetime/date/TEXT/datetime2</p> <ul style="list-style-type: none"> - "date", "time"

	<p>VARCHAR(255)/varchar(255)/VARCHAR2(255)/TEXT</p> <p>- other field names</p> <p>Enter * before the field name to recognize as primary key. e.g. *itemNo:int.</p> <p>Enter : between field name and field type to custom field type, e.g. itemName:varchar(255).</p>
Reorder Field	- Select table in Model Diagram, then press and hold the Shift key. Use  to drag the field to a desired location.
Delete Field	- Select table in Model Diagram, then press and hold the Shift key. Use  to drag the desired field out of the table.
Add Vertex to Relation	- Select relation in Model Diagram, then press and hold the Shift key. Click on the relation to add vertex.
Delete Vertex on Relation	- Select relation in Model Diagram, then press and hold the Shift key. Click on the vertex.
Delete Relation from Model	- Select relation in Model Diagram and press Shift + Delete.
Switch to Hand Mode	- Press and hold the Space key, then move the diagram.
Select a Page in Print Preview	- Press and hold the Shift key, then point to a page to show the page number. - Press and hold the Shift key, then click a page to jump to the corresponding page in Model Diagram.