

DIA

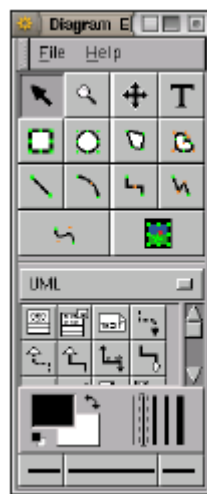
Creating Charts and Diagrams

Dia is a vector-based drawing tool similar to Win32 OS Visio. It is suitable for graphical languages such as dataflow diagrams, entity-relationship diagrams, organization flow charts, universal modelling language (UML) diagrams, electronic circuit diagrams and much more. It is ideal when the diagram has shapes that recur and are connected by lines.

Dia is extensible through the use of sheets that contain collections of shapes for use in diagrams. The ER sheet, for example, has shapes for different types of entities, attributes and relationships as required when drawing entity relationship diagrams for database design.

1 Basic Operation

The first step in drawing is to start a new canvas with File->New Diagram. You then select objects, lay them out on the canvas, add the lines to connect the objects, and add relevant text.



Main Dia Window

The tools available on the main Dia window fall into four distinct areas. The Pointer and Standard Shapes generally occupy the top half of the window. The Sheets area is next with an option menu that may be showing UML as the currently selected sheet. Below this (in a scrollable window if required) are the actual shapes provided by this sheet. The next area selects the pen color and type. Finally, line types are selected with the final row of buttons.

If you are unsure of the purpose or intent of a shape or button simply move the mouse pointer to hover over the corresponding button and a tooltip will remind you. Click the left mouse button on the tool button to activate the tool.

Creating Diagrams

A new diagram is initiated through File->New Diagram. This will pop up a window containing an empty canvas ready for drawing, similar to that in Figure 1.

The canvas is decorated with a grid to guide the drawing. The default grid is drawn every centimeter in both directions.

We are ready to create our diagram. A simple entity relationship (or ER) diagram will serve to illustrate the process. An ER diagram illustrates the

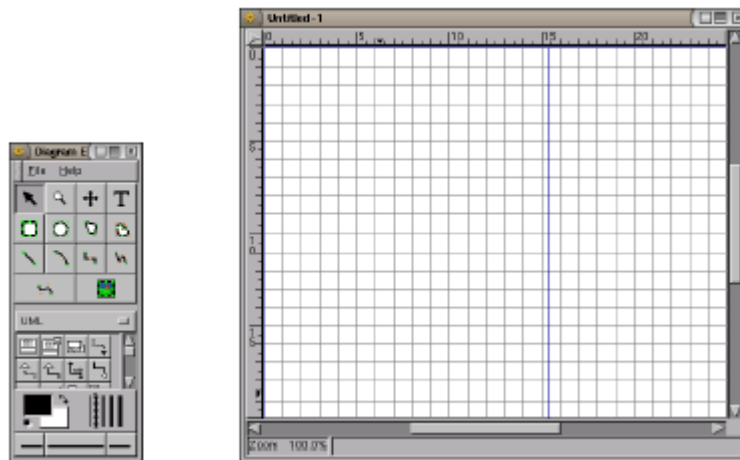
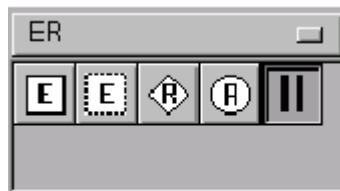


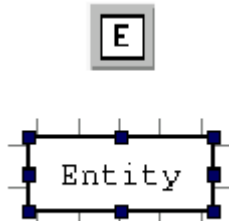
Figure 1: The default new canvas ready for a new diagram.

structure of a database and is an important tool in database design. The basic diagramming elements of an ER diagram are the entity (a rectangle), the relationship (a diamond) and the attribute (an oval). There are variations to each of these that identify different interpretations. These elements are connected with either single or double lines. All these diagramming elements are supplied by the ER sheet.

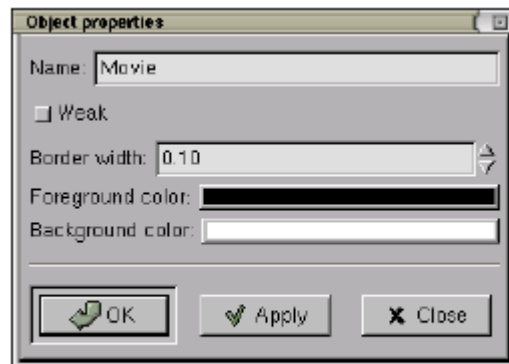


ER Sheet

Let's put together a design for a Movies database that will store information about movies and their stars. We have two entities in our database: Movies and Stars. Entities (strong entities) are represented pictorially as rectangles containing text that names the entity. To create the entity Movie, click on the Entity button (first button) of the ER sheet. Then move the mouse pointer to the canvas and click again (with the left mouse button) to place a rectangle containing a default label (Entity).



You will now want to change the name of the entity to Movie. To do this double click this entity with the left mouse button to bring up the Object properties window.



Now double click the word Entity that appears in the Name: text field and type Movie. Click the Apply button and you will see the entity name change on the canvas. You can click on OK or Close to close the Object properties window if you wish.

Next we will create the attributes of this entity: a Movie has a Title, the Year in which the movie was made, and the Length of the movie. The procedure for creating attributes is the same as for all shapes. Select the Attribute tool (the oval, fourth button) from the ER sheet and click on the canvas where you would like to place the Attribute. Double click this to edit the Object properties to change the Name of the attribute to Title. This attribute is also going to be the attribute by which we uniquely identify every movie in

the database. This is called Primary Key, so select the Key checkbox. Click on the OK or Apply button for this change to take effect.

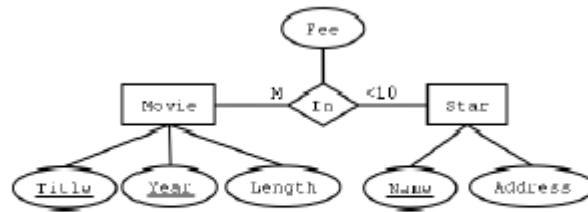


Figure 2: Sample entity-relationship diagram.

We create the weak entities, relationships (diamonds) and the participation connectors in the same way. The second button in the ER is used for drawing the weak entities. The third button is for relationships. The fifth button is for the participation connectors. The object properties of the participation connection help you in specifying total participation (double lines connectors) and partial participation (single line connectors).

Pointer, View, and Text Objects

The top section of the main Dia window contains the pointer and a collection of standard shapes. The pointer (the top left icon with the arrow) allows you to select objects on the Dia canvas. Next to the pointer are the zoom and scroll buttons. The zoom tool will enlarge (zoom in on) the diagram each time you click the left mouse button somewhere within the diagram. By holding down the Shift key when using the zoom tool the diagram will be zoomed out.



The fourth button selects the Create Text tool allowing text to be added to your diagram.

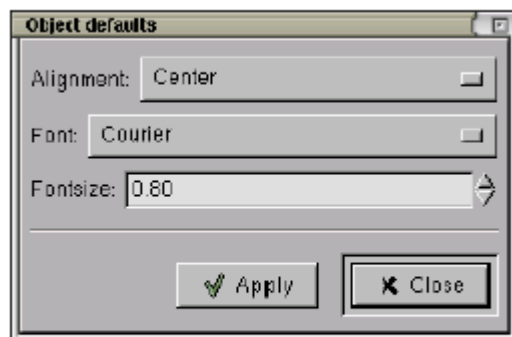
Standard Shapes

The second collection of four buttons on the main window consists of the standard shapes of a Box, Ellipse, Polygon, and a Beziergon.

The next group of five buttons are line drawing tools consisting of a Line, Arc, Zigzagline, Polyline and Bezierline.

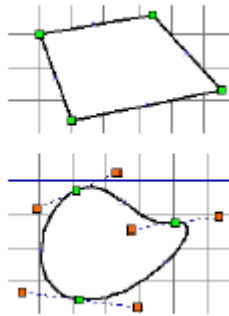
The final button allows you to import graphics from other applications.

Object Properties can be changed by double clicking on an object. For example, double clicking the Create Text tool button will bring up a window to set defaults for the alignment of the text, the font, and the font size. The Box object defaults include whether the background is drawn and how the corners are rounded.

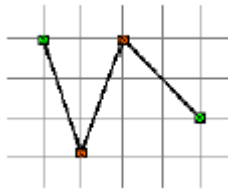


Handles and Connection Points

All objects have handles that generally allow the object to be resized. The usual handles are small boxes with a green fill. You can move these handles by dragging them with the mouse. This will resize the object. If the handles have a dark blue fill instead then the object cannot be resized. This is typical of boxes that resize automatically as you enter text into the box. Lines have handles at each end that are also green (but also have a small internal cross identifying it as a connection point—see below). Once again you can resize the line simply by grabbing these handles with the left mouse button and moving the handle around.



Some lines (e.g., a polyline) have internal handles that are colored orange. These handles have restricted movement and may also move as you move the line end-points.



Most objects also have connection points that identify locations on the shape to which lines can be snapped. (An Arc, for example, does not have any connection points.) They are identified as the small blue crosses on the edges of the objects. The handles on the end of lines also have crosses identifying connection points. A line's connection point becomes attached to the connection point of an object, as indicated by the line's green handle becoming red. Moving the object will also move all of the attached lines.