



GIMP

SHAPE TOOL

Concept of a vector based shape tool

Elective 1: Media Spezialization

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Assignment

The task is to develop a shape tool that enables creating customized shapes. The fact that they are vector based requires perhaps specific layer properties. To keep working on GIMP simple it is necessary to integrate it in a logical way into the present GIMP user interface that the user doesn't have any problems to learn how it works. The tool should also be able to use it in an individual way, that every user will be satisfied working on it.

Process

Finding all the options a shape tool has to cope with a list of sub-functions is the basis for developing. Following sub-functions should be integrated in this tool to be competitive:

BASIC FUNCTION:

shape:

create, delete, basic (often used) shapes like the rectangle, circle, triangle, star, special shapes in a shape library, save, load, copy, paste, duplicate, multiply

SUB-FUNCTIONS:

size:

transformation (rotate, mirror, scale, shear, move)

appearance:

(rounded) corners, number of sides, border, fill (colour, gradient, pattern), opacity, inner- and outer angles, degree of angles

position:

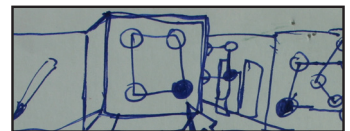
arrangement, direction

special:

combine, divide, exclude, intersect

Solution varieties: Sketches

To outline all these functions some different ways have been developed. What all of them have in common is, that by creating a shape a new layer is automatically created - the vector layer. It is represented by it's own icon and every created shape is on this layer. Some existing tools change their functionality. Detailed information about the layer properties succeed after the information about the "shape tool" sketches.



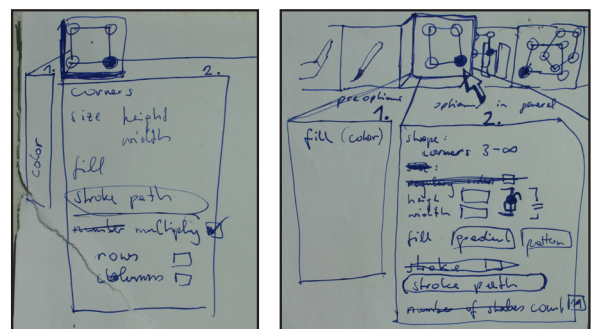
Toolbox items

Sketch One

Sketch one builds up on three tools: The "shape tool", that is used to create any kind of shape, the "shape-library", which enables a library of existing and fungible libraries and the "combine shapes" tool which allows to combine, exclude, intersect and divide two or more already created shapes. All of them are situated in the toolbar and open a different function, as explained.

The first tool is to create a shape with all its options (size, number of corners, fill, appearance, multiply) in expand-menus. All these options are adjustable in the bottom part of the toolbox. The number of sides will be defined by a slider that starts at three for a triangle and ends up at infinite (could be maybe 1000) for a circle.

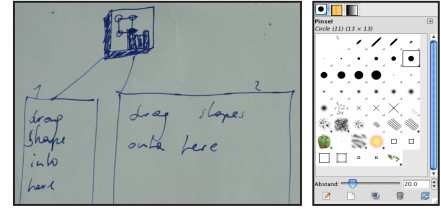
The option to modify stroke is assumed by the "stroke path" dialog of the existing path tool.



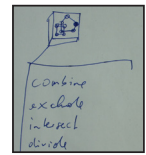
Opportunities of adjustments of the "shape tool"

Fill is predefined by the color which is active in the foreground colour, but can also be modified in the dialog. While changing all these options a preview is shown at the workspace.

The second item in the toolbox, which is related to the shape function, is the library. By activating it, a library of shapes appears in the right part of GIMP, where also the pencil, pattern and gradient library is situated. Precreated shapes can be dragged on the workspace, own shapes can be dragged into the library and users can also compile new libraries (for example "his/her own webdesign library, where all personal webdesign shapes he/she is using are situated).



Library item and where the library will be situated

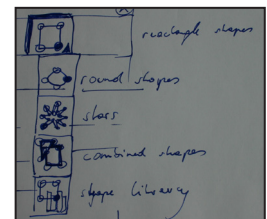


Combine Shapes

A third tool allows to combine, exclude, intersect and divide two or more than two shapes. Those functions can be chosen by activating the "combine shapes" item in the toolbox. In the bottom part of the toolbox will be four opportunities to combine shapes: Combine, divide, exclude and intersect. Of course, those functions can only work when two or more shapes are selected. They can be marked by selecting them on the workspace or in the layer stack. And, of course, they need to have overlaps.

Sketch Two

This idea is very similar to the first one. The difference is to save up space in the toolbox and have just one item for shapes. The functions which are related to the shape tool appear in a kind of a drop-down menu by click and hold on the shape item in the toolbox. First item allows to draw up rectangle or square, second one circles and ellipses, third one stars, fourth is to combine shapes and the fifth item in this drop-down list opens the library in the right sidebar of GIMP.



drop-down version

The rectangle item is nearly the same as in sketch one. Appearance, size, fill and multiply options can be adjusted in the same way. An option to have four sides of the same length allows to create a square. The slider for the number of sides is dropped, other shapes are created by activating the other items of the drop-down list.

The circle-shape item is similar. Width and height are adjustable, by activating that they are of the equal length a circle is created.

Also the star item works with the same parameters, but the number of corners is added in form of a slider and for adjusting the size of a star an inner diameter input field will appear.

The "combine shapes" and the "shape library" items work exactly the same as in sketch one.

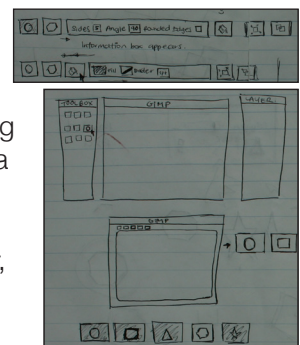
Also in this sketch preview are shown on workspace while adjusting the options. The appearance of the shapes are also modified in the way as it usual for paths, with a "stroke path" command.

Sketch Three

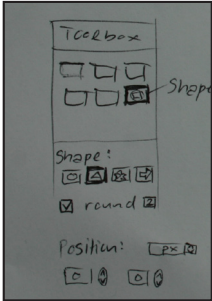
This idea is also based on a "shape tool" in the toolbox. By activating it, a "dock" appears around the workspace.

The dock contents all the options which can be modified on a shape. The first thing is to choose on of the basic shapes, which are circle, rectangle, triangle, star and a item for every shape which has more than four sides.

By choosing on item, for example, the rectangle, the other items for basic shapes unite and more options for the rectangle appear. Those options regulate fill, border, size, corners (rounded or not). On the right side of these adjustments are items to combine, transform and fill the shape.



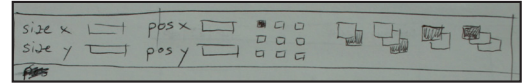
"dock" appears on workspace



Toolbox and adjustments

Sketch Four

By activating the shape tool in the toolbox of sketch four, options for size, position and arrangement appear on the top of the workspace.



Adjustments on top of the workspace

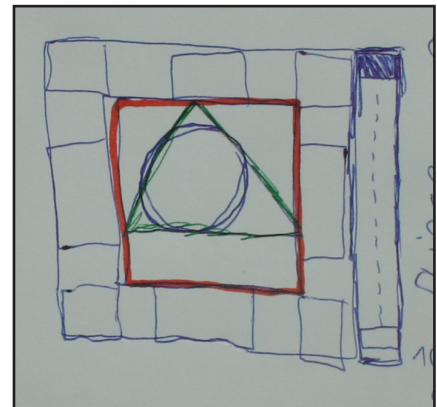
In the bottom part of the toolbox you can choose one of the basic shapes or create a customized. Also the option of rounded corners, fill and border are situated in that area. For every basic shape accurate options will appear.

To transform a shape users can use the existing transformation tools of GIMP or select the shape on the workspace and move it or drag the corners or sides to scale it.

Sketch Five

Sketch Five describes a additional function for resizing and editing the number of sides directly on the workspace.

The idea was a slider function for quickly adding sides to a shape, or reduce them, because most of the basic shapes could be created in such a easy way. To speed up working with basic shapes, there is also a slider directly integrated into the overlay resize tool. (see scribbles) Starting with a basic shape like a circle (0 sides) you could quickly add sides to get a triangle (3 sides) or rectangle (4 sides) out of it, by just drag down the slider.



Adjustments on the workspace

Concept

The final result is a combination of some of the sketches or parts of them. An implementation of some other tools' functionality on the vector layer is mandatory. In some cases their mode of operation have to change.

Selection Tools

By selecting a shape, the shape keeps being vector-based. By copying on a raster layer, the shape becomes a rasterized object. If you copy it on another vector layer, the shape keeps its properties and stays as a vector shape.

Path Tool

The path tool allows creating customized vector shapes on a vector layer.

Transformation Tools

The transformation tools make freehand transformation possible.

Fill and Gradient Tools

The fill (or gradient) of (marked) shapes can be changed after creating with those tools.

Color-Selection-, Scissor-, Foreground-Select-, Crop-, Paintbrush-, Pencil-, Eraser-, Airbrush-, Ink-, Clone-, Healing-, Perspective-Clone-, Blur/ Sharpen-, Smudge-, Dodge/Burn – Tools are inactive while working on a vector layer.

Toolbox

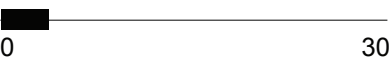
Shapes

 Shape icon (active)

Toolbox

Shapes

Sides

 0 30

Ellipse-Options


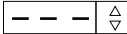
circle

Size W: H:

Position X: Y:

▶ **Fill**

▼ **Appearance**

 Ellipse-Shape

Choose the ellipse icon (0 sides) and move the sidebar or just type the number of sides in the text field. For instance if the user wants to create a pentagon 5 sides have to be chosen.

The circle option can also be activated with pressing a key (maybe shift).

Here you can fill the shape with colours and patterns (same options like in the fill tool). By clicking on the arrow all options will be visible.

Toolbox

Grid of shapes: 10 squares, with the 4th square in the 2nd row containing a triangle.

Shapes

Grid of shapes: circle, triangle, square, star, bar chart.

Sides

Slider from 0 to 30, with a value of 3.

Triangle-Options

rounded corners

Size W: 5.5 px H: 7.8 px

Position X: 5.5 px Y: 7.8 px

▶ **Fill**

▼ **Appearance**

Color swatch: black, dashed line, 2 pt

 Triangle-Shape

If you want a triangle with rounded corners tick the option rounded corners.

Toolbox

Shapes

Sides

0 30

Rectangle-Options

rounded corners radius:

square

Size W: H:

Position X: Y:

► **Fill**

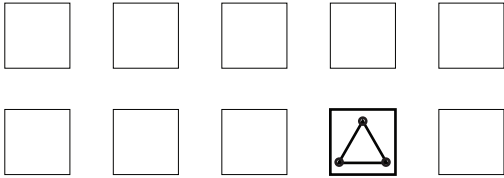
▼ **Appearance**

Rectangle-Shape

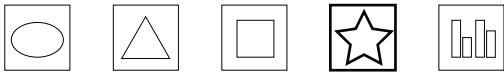
If you want a square or rectangle with rounded corners tick the option rounded corners. Choose the radius of the corners.

The square option can also be activated with pressing a key (maybe shift).

Toolbox

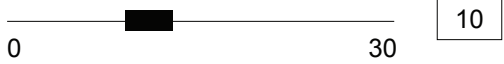


Shapes



 Star-Shape

Sides



Star-Options

rounded corners radius:

If you will a star with rounded corners tick the option rounded corners. Choose the radius of the corners.

Sides

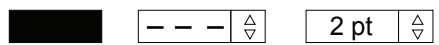
Number of Sides.

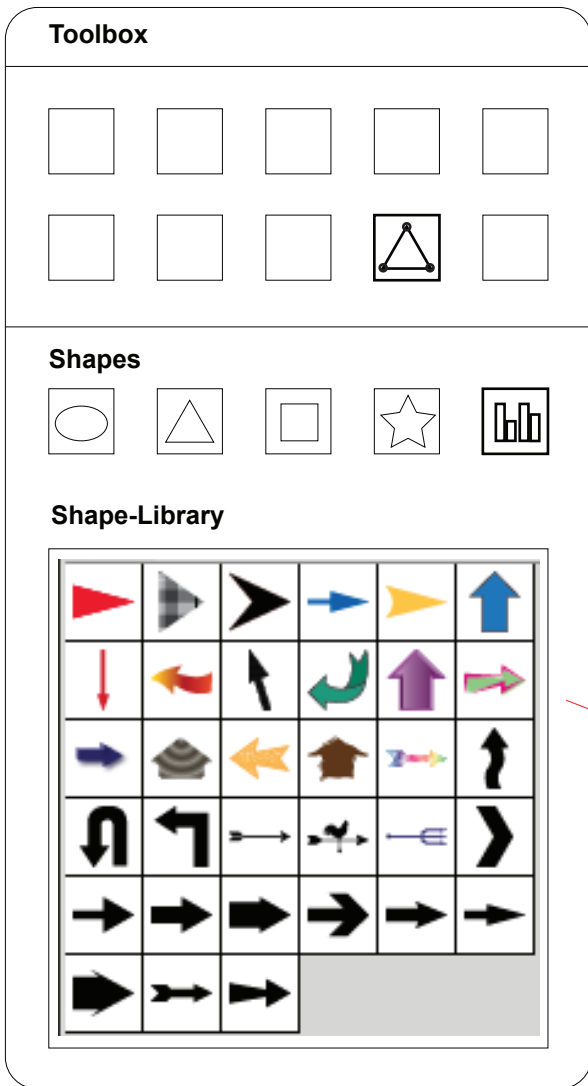
Size W: H:

Position X: Y:

▶ **Fill**

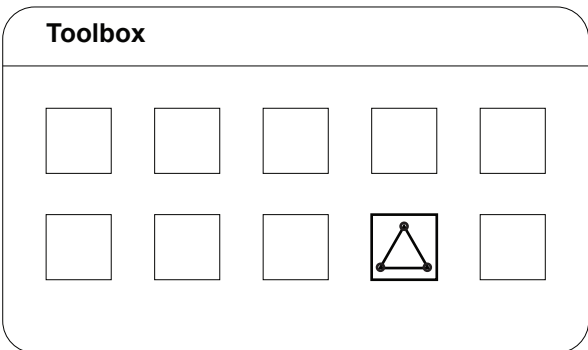
▼ **Appearance**



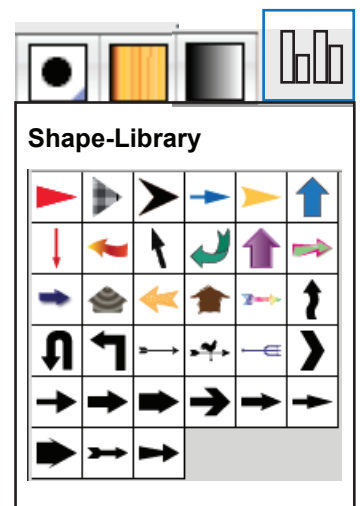


 Shape-Library

There are some special shapes in the library. But when you created a very nice shape you can also save it in the library. Just create it in the workspace and drop it into the library.

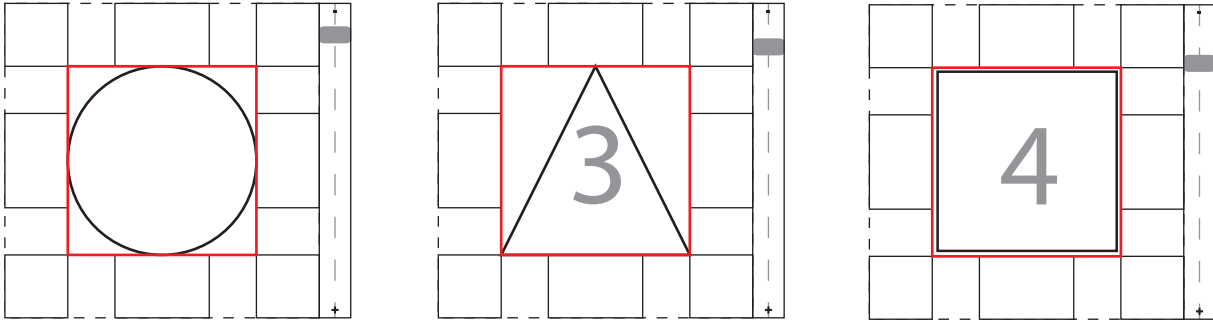


When you click on the shape icon the shape-library will automatically appear. (Maybe this function can also be adopted into the brush and fill tool).



Creating simple Shapes & Slide Bar

1 Easily after placing a shape on the working space, the user will be able to transform it in the window display on the toolbox window. But as a new form of interaction with the user, it will be easier to do it with the help of the slider. As you click on the shape, a slider and transform tools will appear, and moving upwards, the number of sides decreases, and moving downwards, increases. The number of sides are displayed as long as the user drags the slide.



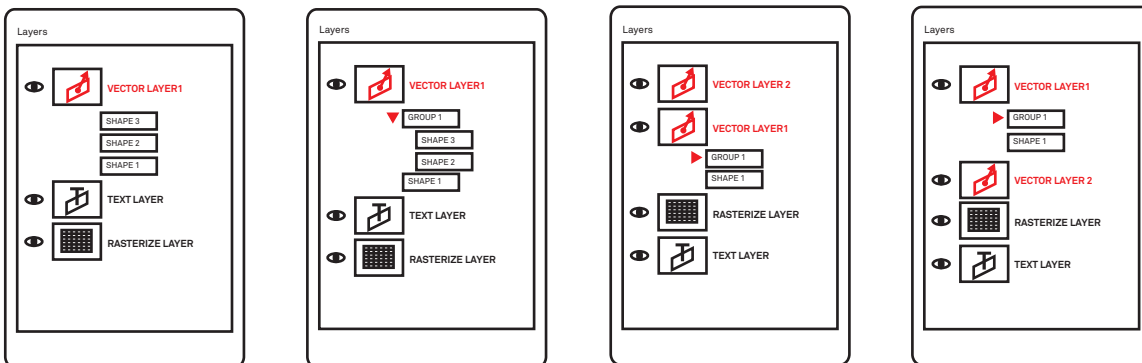
Create and manage vector layers

1 When the user clicks on the shape tool and creates a shape (Shape1), automatically GIMP creates a vector layer with the shape in it (Layer1).

2 If there is the need to group some shapes in the same layer, the user can also create groups inside the layer (Shape 2 & Shape 3, in Group 1)

3 If there is a necessity of creating a new layer, the user will be able to create as many layers as needed (Layer2).

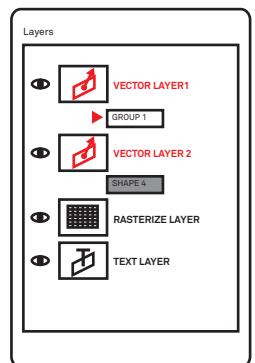
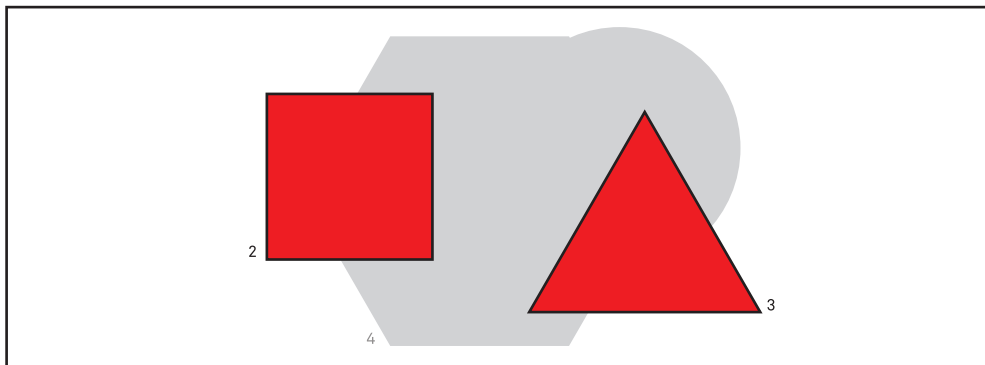
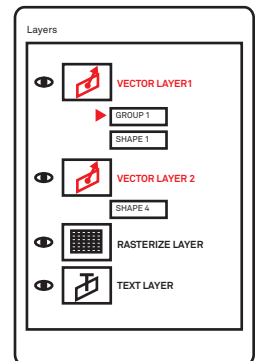
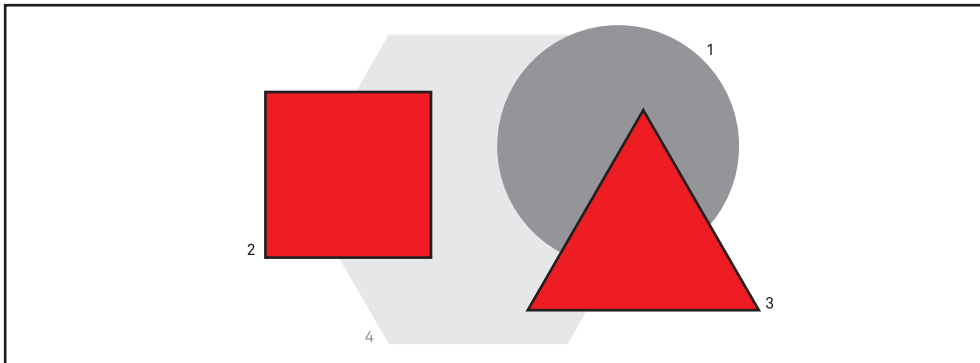
4 To work with layers, there is the option of renaming and reordering layers, as well as the shapes in them, working based on a drag and drop system (Layer 1 above Layer2).



Multiple Vectors in a Layer - Properties & Combinations.

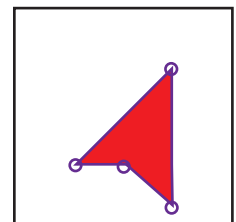
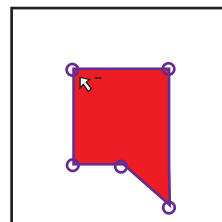
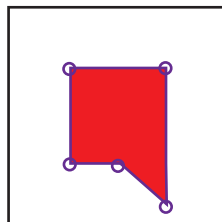
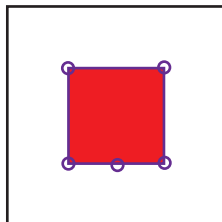
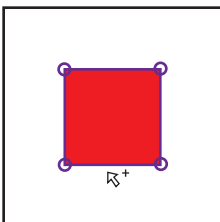
1As the user will have the opportunity to work with as many vectors as needed in the same layer, the properties given to a specific layer will be applied for all the included. (Vissibility, Opacity, Mode). Working in a 100% opacity for Layer 1. With the creation of a new shape (Shape4) into Layer 2, applying a 50% Opacity.

2 For the combination of vectors and shapes, there is the possibility to use the foreground select tool, even if the shapes are in different layers or groups. Combining Shape 1 and Shape 4, the main properties will be taken as the first click in shape, in this case, Shape 4.



Transforming simple shapes towards path-like complexity.

1When the user is working with a simple shape, and then decides to modify it and transform into a more complex one, the process is quite easy. By selecting the shape and double clicking on the path, the path edit mode appears on the toolbar, and the user will have the chance to edit the anchor points, adding, deleting or moving the angle.



Path-tool on vector-layers

When you use the path-tool on a vector-layer, it creates a shape starting at the first point you made, the color of the shape is based on the actual color of the foreground. Edit, ad, and delete points works exactly the same as in the current path-selection-tool.

