Tangible multitouch database manipulation
**Tangible Data** is an environment for the manipulation and exploration of databases for effectively extract pertinent information.

**Tangible Data** combines multitouch and tangible interfaces for the exploration of abstract data in an intuitive, physical and spatial manner.

**Tangible Data** integrates R-Project and proposes additional visualization in javascript with help of D3.

**Tangible Data** gives you the full capabilities of R & D3 frameworks, combining powerful visualization components and a data-driven approach to a modern natural interaction.

**Study abstract realities with concrete manipulations:**
- Explore and test hypothesis more quickly
- Work in collaborative fashion to better analyze data

**Characteristics**
- Present fields of the database
- Filtering numerical and discrete values of the fields
- Manipulation and distant visualization with the aide touch and tangible objects
- Apply operations to selected fields and group discrete values
- Display in a browser the results of a selection, generated by R or D3 in javascript
- Graphic link between operators for executing operations
- Manipulation of filters and selections with objects for updating and exploring the results
- Collective exploration of data, sharing the treatment and results

“This dynamic and collaborative approach perfectly combines with the approach of traditional programming”
To carry out a search, R-project has a basic logic, there are four large groups of elements:

- The data bases
- The filters
- The operators
- The visualizations

**the data bases**
Select your data source.

**the filters**
A select query helps you retrieve only the data that you want.

**the operators**
The operators carry out the filter calculations using R filters.

**the visualizations**
Specify your data visualisation
Using either R or D3 graphical representation

**les icônes**
- **The options** Configure a research element
- **Update** Display selected options and indicates the element status.
- **Run** Apply the chosen operation.
- **Chart** Show the operation results.
- **Web** Visualize the operation results on a web page.
TangibleData
The components

the general configuration menu

This is an overview of the interface general configuration, in its “mini” and “expanded” versions. The menu is presented under three items:

- Configuration is the mode for the set preparation. In this mode, the user assigns the elements, the categories and names the mones. The Use mode presents a less detailed interface to only manipulate the parameters of each element.
- Load access the loading of pre-configured sets.
- Save saves the current set

the mone

The mone is the graphic representation of an object in the interface. The mone contains all the elements that are assigned to it:

- The title of the mone
- The data base
- The filters
- The operators
- The visualizations

PERSONALIZE A MONE

It is possible to name the mones to rapidly designate the operations it represents.

Touch the home zone to access the keyboard, in order to modify or add a title.

the R-project elements

Here is a view of the R menu, minimized and extended.

The menu is organized in sub sections, representing the categories of available elements.

To build a set simply drag the elements of the list in the home zone of the mone or on the screen.
The user makes a personal interface treatment chain by placing the elements the multitouch screen. The **mone** objects contain the treatment chain. The elements are linked to indicate the order of execution. Each element possesses an input and as many outputs.

The connection between the elements is carried out by enlarging the links between the – and + icons. Each element can be configured.

During element updates, the linked elements adapt their state.

The elements associated to a mone move with it and are invisible when the object is taken off the screen. This allows for a dynamic organization of the interface. The invisible elements still stay active and can be reintroduced at any point through “mone” object.