

Data visualization tools by phases in the development process

Using Ben Fry's process model of data visualization development as a base, our team mapped various visualization tools across the phases in which they assist the designer.

Our search focused on visualization tools, resulting in a heavy emphasis in the 'represent' phase. In this phase, the tools are grouped into discrete clusters based on their visual outputs. In addition to these visual output categories, the dimension of **fixed/restricted** ↔ **customizable/flexible** became a useful way to understand the tools.

View in full-screen mode for hyperlinks to tool websites.

RESEARCH PROJECT SUMMER 2014:
Understanding Data Visualization Tools for Designers

Designers have access to a sea of data that could be harnessed to understand the world and better inform their design choices. This project investigates existing data visualization tools that designers can use in their research without the need for heavy coding expertise.

For more information, visit:
www.id.iit.edu/projects



Data visualization development process (Fry)



acquire
Obtaining the data, idiosyncratic formats

parse
Changing into a format that tags each part of the data with its intended use. Delimiting, then formatting.

filter
Removing portions not needed for your use.

mine
Performing statistical/mathematical calculations to obtain additional information.

represent
Deciding the basic form a data set will take and presenting it visually.

refine
Using graphic design methods to clarify the visual representation.

interact
Allowing user to control or explore the data.

Tools in color also create visual representations. The color indicates the level of customization it provides (see 'represent' below.)

- Key**
- One input/ One output
 - One input/ limited modification of data representation
 - Higher flexibility of data input and visual editing
 - Customization by adding to code
 - Coding languages & platforms
 - Consultancy services

- SurveyMonkey
- Dotspotting
- MapBox
- Better World Flux
- Typeform
- dscout
- Revelation
- Qualvu
- Socrata's Open Data
- GeoCommons
- SocialExplorer
- cube

Tools are available to help users clean, convert or unlock data into compatible formats, allowing it to then be prepared for visualization.

- Trifacta
- Google Fusion Tables
- SVG Crowbar
- Mr. People
- Mr. Data Converter
- Table2Net
- Tabula
- OpenRefine
- Mr. Nester
- Able2Extract PDF Extractor

- Color Brewer
- Chroma
- I Want Hue
- Visage

Interactivity occurs in several ways. The majority of tools below are interactive to support visual exploration during the represent phase (thus not indicated with '+interact'.) Some tools create outputs for sharing that are also interactive, e.g. digitally publishable visualizations that are embedded and shared on websites. Some tools however, only generate static outputs in the form of pdfs or image file formats. There are also tools, like Tangle, whose only purpose is to add interactivity to code.

- Tangle

represent by visual output type

	multiple visual outputs	quantitative charts/tables <small>bar, line, piecharts, scatterplots</small>	timeseries	timeline	connections	mind maps	clusters	treemaps	spatial maps	uniquely specialized *
fixed/restricted										
One input/ one output	<ul style="list-style-type: none"> • dscout +acquire • Trifacta +parse • Typeform +acquire • SurveyMonkey +acquire • Google Fusion Tables +parse +filter • Chronoviz 				<ul style="list-style-type: none"> • Voyant Links • Visual Thesaurus • Voyant RezoViz 		<ul style="list-style-type: none"> • Imageplot 	<ul style="list-style-type: none"> • Treemap 	<ul style="list-style-type: none"> • CrazyEgg • Dotspotting +acquire • Mapbox +refine +acquire 	<ul style="list-style-type: none"> • Voyant Lava • Voyant Bubbleline • Voyant Bubbles • Voyant Thermometer • Better World Flux +acquire • Voyant Knots • Voyant TypeFrequencies Chart • Revelation +acquire
One input/ limited modification of data representation	<ul style="list-style-type: none"> • StatWing • Analyse-it • OfficeReports • ichart • Qualvu • Peity 				<ul style="list-style-type: none"> • Graphviz • NodeXL 		<ul style="list-style-type: none"> • Nineteen • Voyant Mandala 	<ul style="list-style-type: none"> • HeatGraph 	<ul style="list-style-type: none"> • Nvivo • Wordle 	
Higher flexibility of data input and visual editing			<ul style="list-style-type: none"> • Cubism • Envision • Humble Finance • Dygraphs • Smoothie Charts 	<ul style="list-style-type: none"> • Timeflow • Timeline • Timetoast • Dipity • Simile Widgets! Time line • Tom's Planner • Ganti • TimeRime • Tikitoki • Timeglider • Neatline 	<ul style="list-style-type: none"> • Springy • Arbor • Sigma 	<ul style="list-style-type: none"> • Coggle • Mindmeister 	<ul style="list-style-type: none"> • Foamtree 	<ul style="list-style-type: none"> • Carto DB • Batchgeo • Simile Widget/ Exhibit • QGIS • OpenHeatMap • TargetMap • Indiemapper • GeoCommons • SocialExplorer • Modest Maps • InstantAtlas • MapStory 	<ul style="list-style-type: none"> • Pizza Pie Chart 	
Customization by adding to code	<ul style="list-style-type: none"> • Ember Charts • NVD3 • Axis • jsDraw2DX • Chartkick • Javascript InfoVis Toolkit • Recline • Fusion Charts Suite XT • ZingCharts • Highcharts • Flare • Vega • Improvis • Google Chart Tools 				<ul style="list-style-type: none"> • Guess • Cola 		<ul style="list-style-type: none"> • Lingo3G • Circles • Circos 		<ul style="list-style-type: none"> • Unfolding • Leaflet • Kartograph • Polymaps 	
Coding languages & platforms	<ul style="list-style-type: none"> • d3 • Processing • Processing.js • R project 									
Consultancy services	<ul style="list-style-type: none"> • QlikView • TIBCO Spotfire 								<ul style="list-style-type: none"> • Axis Maps 	
customizable/flexible										

A P P S

LIBRARIES

* These are tools that do not follow conventional graphing formats and are emerging as a new visual language. The uniqueness is often due to representing non-quantitative data, therefore requiring a new form of expression.

SOURCES
Visualization development process source: Fry, Ben. *Visualizing Data*, O'Reilly, 2008
Tool information source: Individual tool's websites.