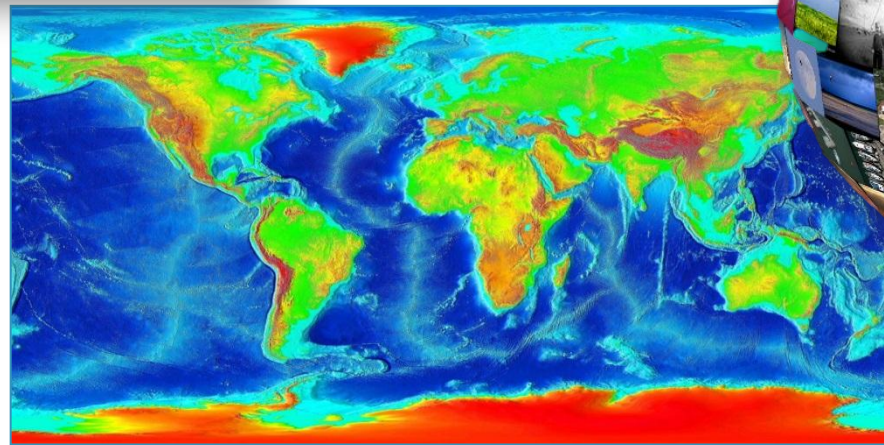
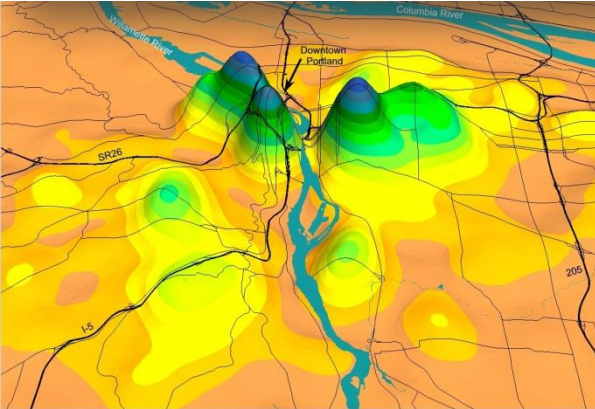
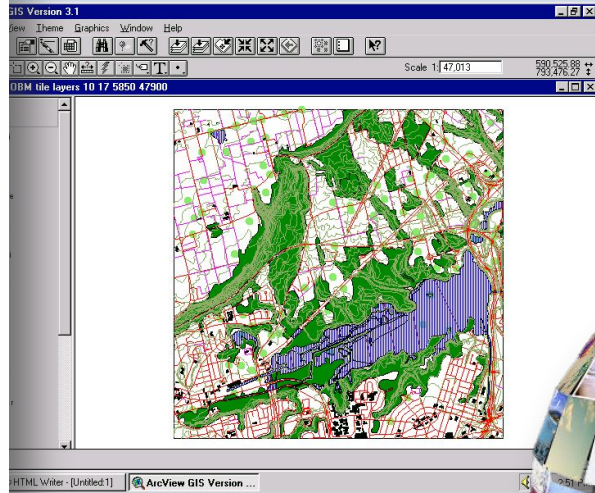
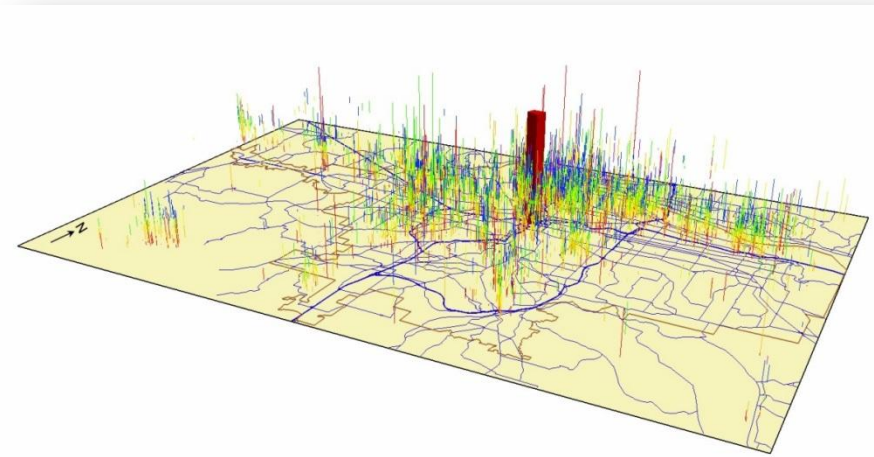


Principles of GEOVISUALIZATION





Geovisualization

... codes and encodes spatial information.

... includes interface design, interactivity, generalization and publishing.

... offers a method for seeing the unseen.

... is the process of transforming information into a visual form, enabling users to observe the information.

... enables to perceive visually features which are hidden in the data but nevertheless are needed for data exploration and analysis.

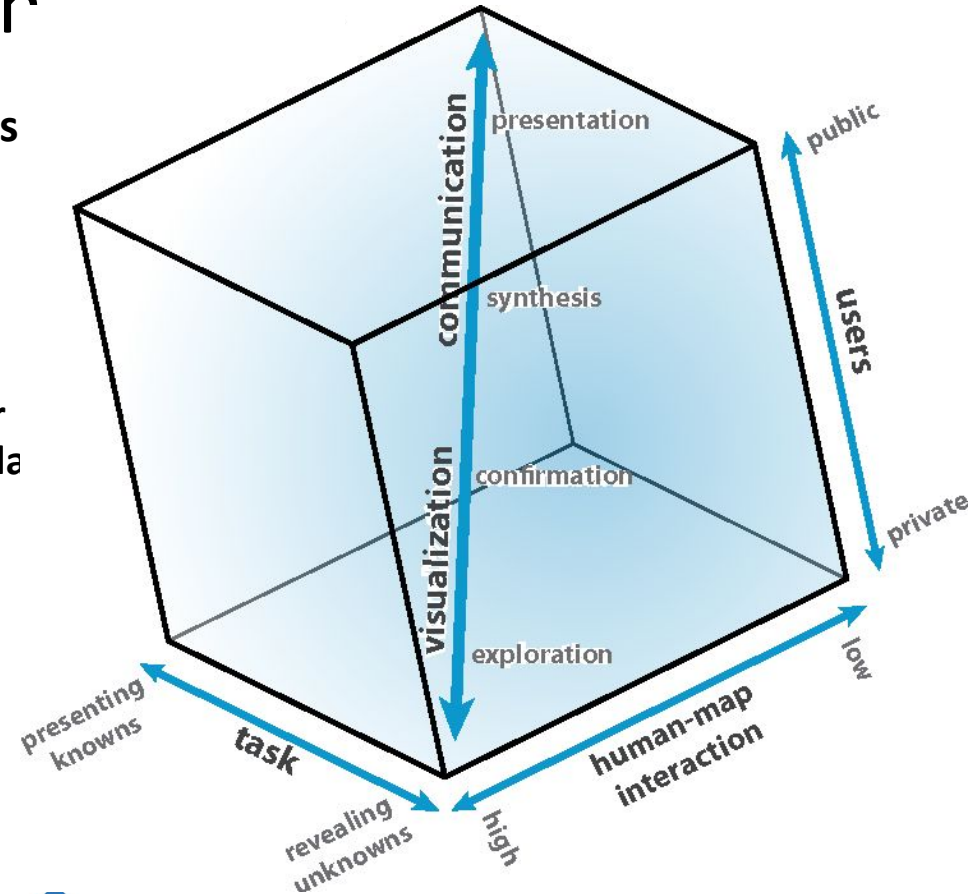
... is used to explore, analyze, synthesize, and present spatial data. Today's geovisualization enlarges conventional map design.

... typically uses an interactive computer environment for data exploration, it entails the creation of multiple (including 3-D) representations of spatial data, or it allows the representation of changes over time.

Nature of geovisualization

fundamental to effective geovisualization is an understanding of:

- ✓ how human cognition shapes GIS usage
- ✓ how people think about space and time
- ✓ how spatial environments might be better represented using computers and digital data



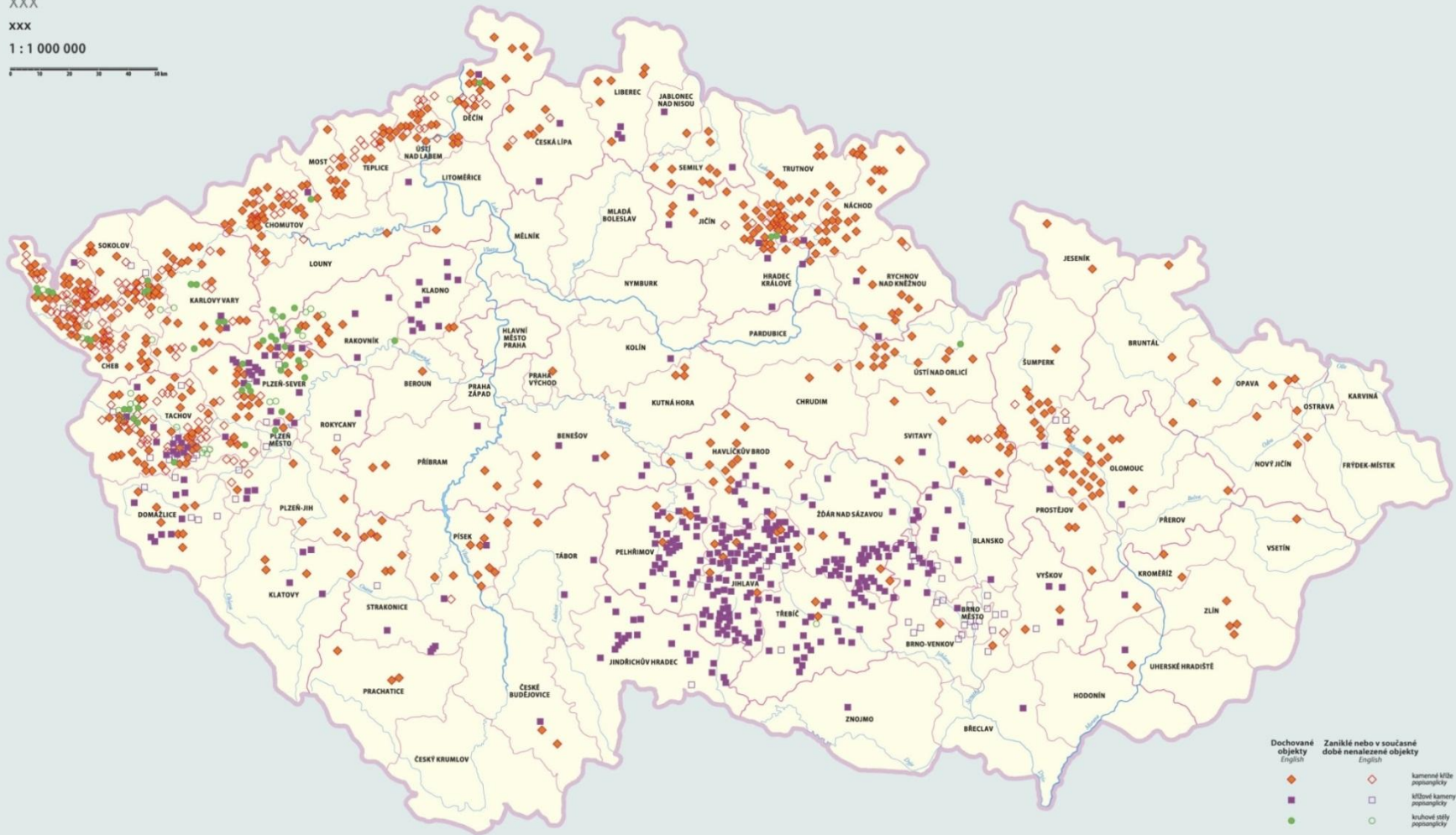
SMÍRČÍ KAMENY

XXX

XXX

1 : 1 000 000

0 10 20 30 40 50 km



Research goals of geovisualization

- exploration/exploitation of data and informatio
- enhancing understanding of concepts and proce
- gaining new (unexpected, profound) insights
- making invisible visible
- effective presentation of significant features
- quality control of simulations, measurements
- increasing scientific productivity
- medium of communication/collaboration



Augmented reality

Web mapping

Landscape Visualization

Virtuality

Data mining

Exploratory data analysis

Scientific geo-visualization

Virtual reality

Visual analytics

Digital Cartography

Three key messages of Geovisualization

Geovisualization is relevant!

- Modern visualization is key to humankind. Without maps, we would be spatially blind. Knowledge about spatial relations and location of objects are most important for enabling economic development, for managing and administering land, for handling disasters and crisis situations, or simply to be able to make decisions on a personal scale on where and how to go to a particular place.

Geovisualization is modern!

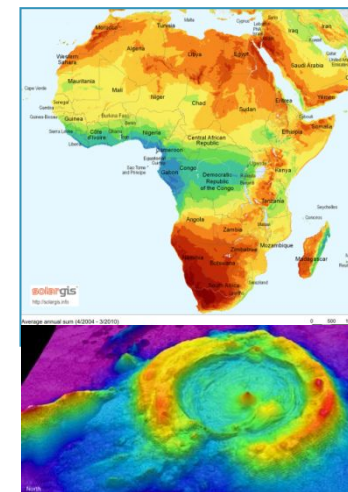
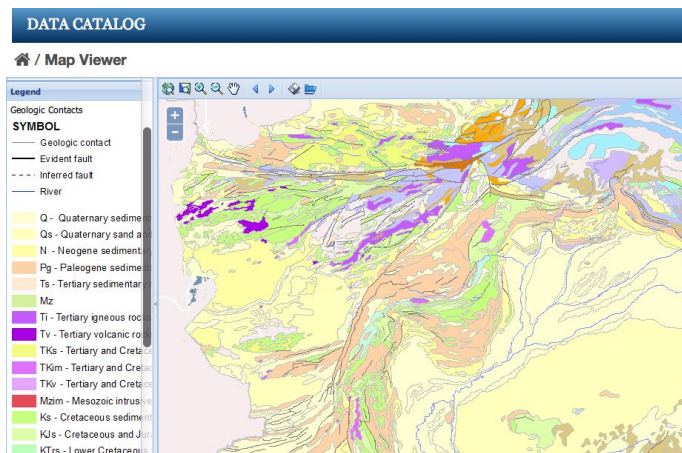
- New and innovative technologies have an important impact on what map makers are doing. Maps can be derived automatically from geodata acquisition methods, smart models of geodata can be built, and a whole range of presentation forms is now available.

Geovisualization is attractive!

- Maps and other geovisualization products are attractive. Many people like to use maps; to play around with maps, for instance, on the Internet; or simply to look at them. We can witness a dramatic increase in the number of users and use of geovisualization currently.

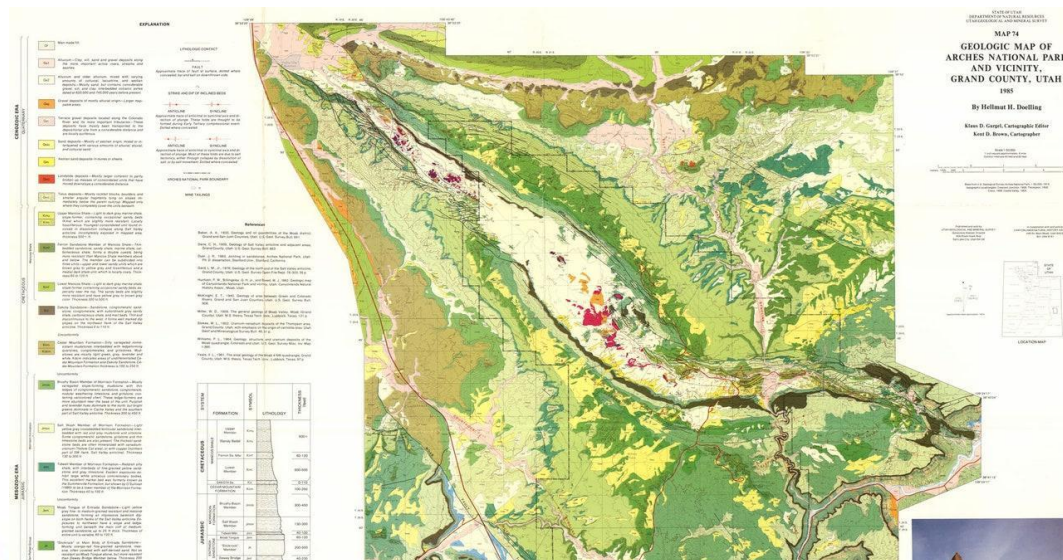
Geovisualization products

- ✓ Printed maps
- ✓ Web maps
- ✓ Mobile maps
- ✓ Infographics
- ✓ Dashboards
- ✓ 3D maps
- ✓ Haptic maps
- ✓ Map animations
- ✓ User experiments
- ✓ Multimedia maps
- ✓ Image maps
- ✓ Atlases
- ✓ Story maps
- ✓ Virtual maps
- ✓ Swipe map



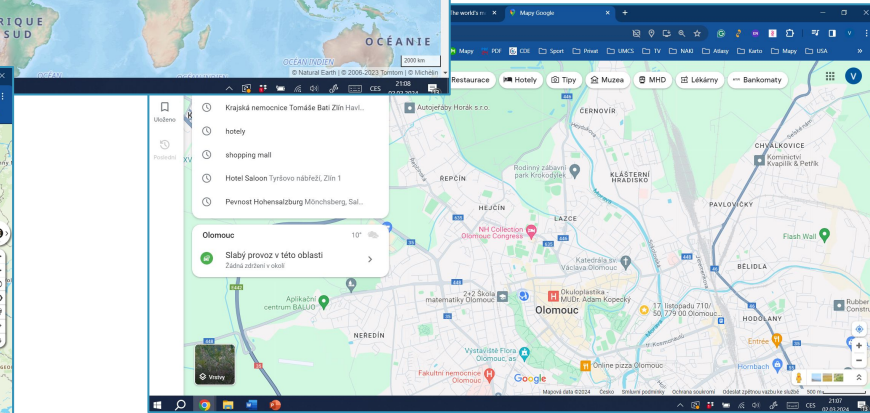
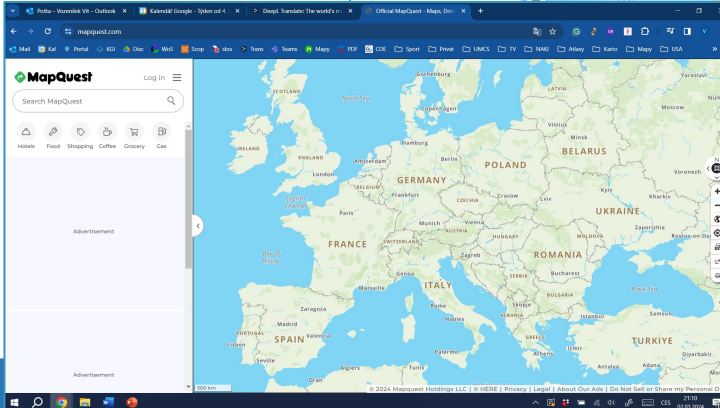
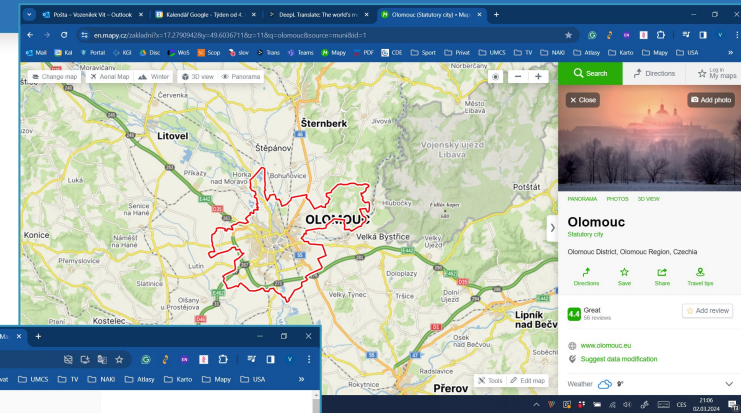
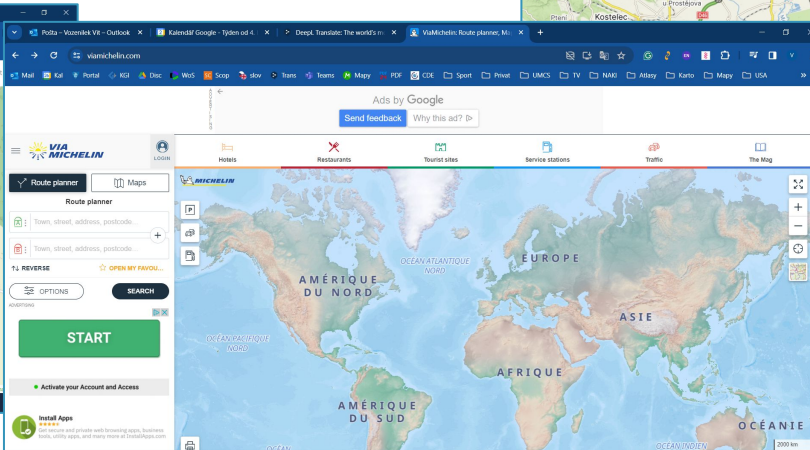
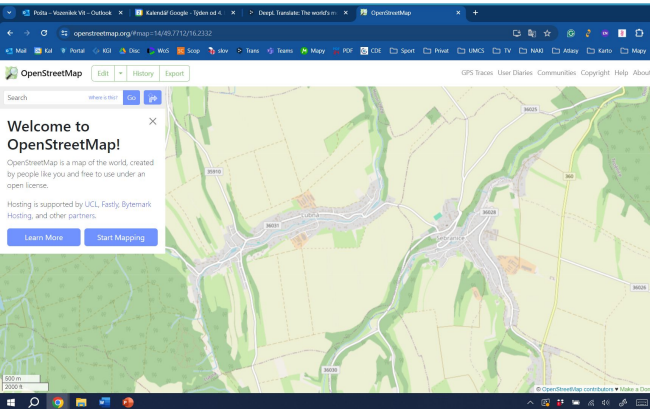
Geovisualization products

✓ Printed maps



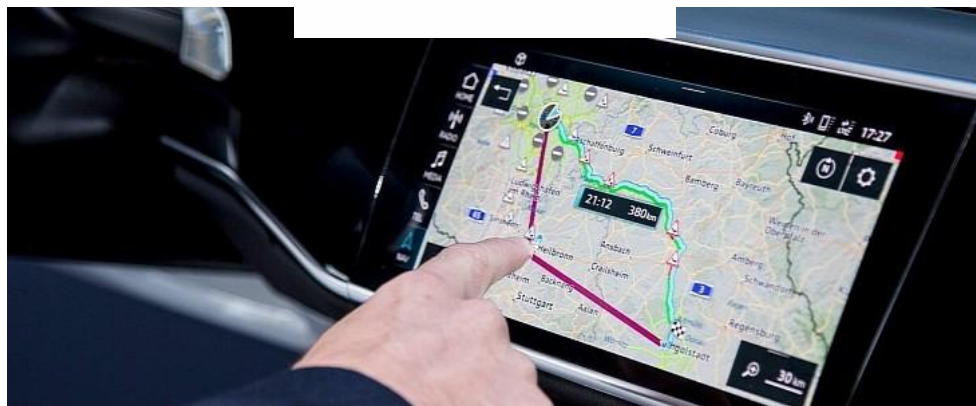
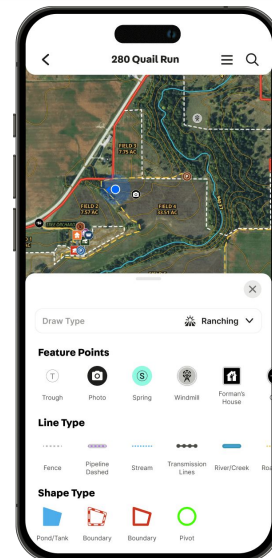
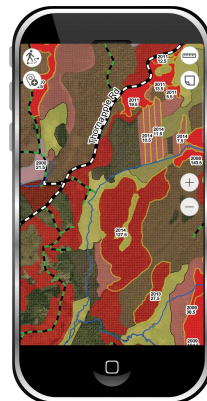
Geovisualization products

✓ Web maps



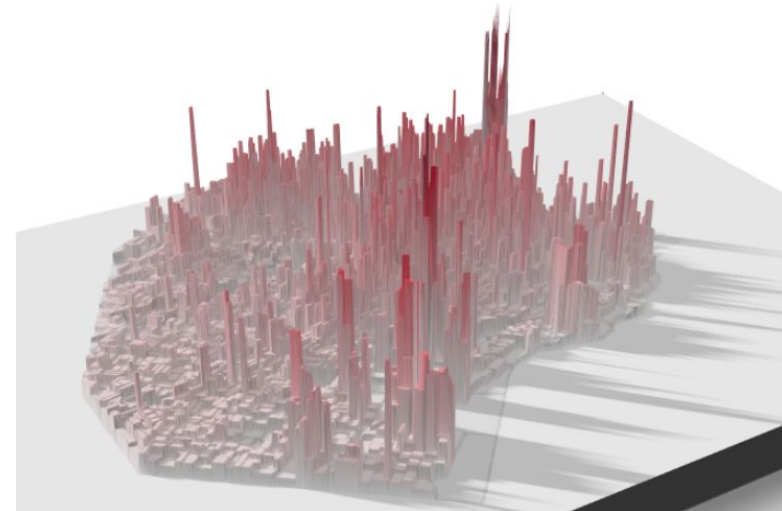
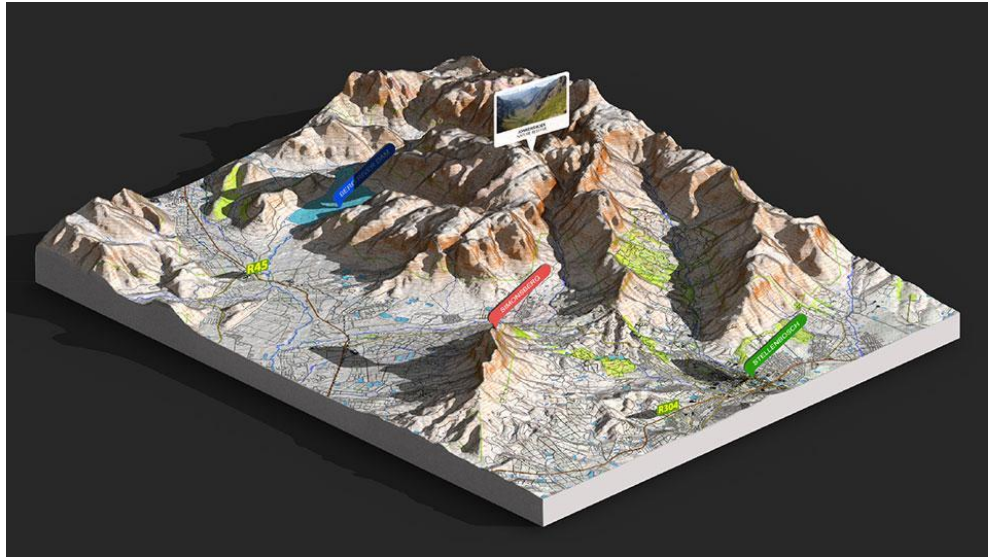
Geovisualization products

✓ Mobile maps



Geovisualization products

✓ 3D maps



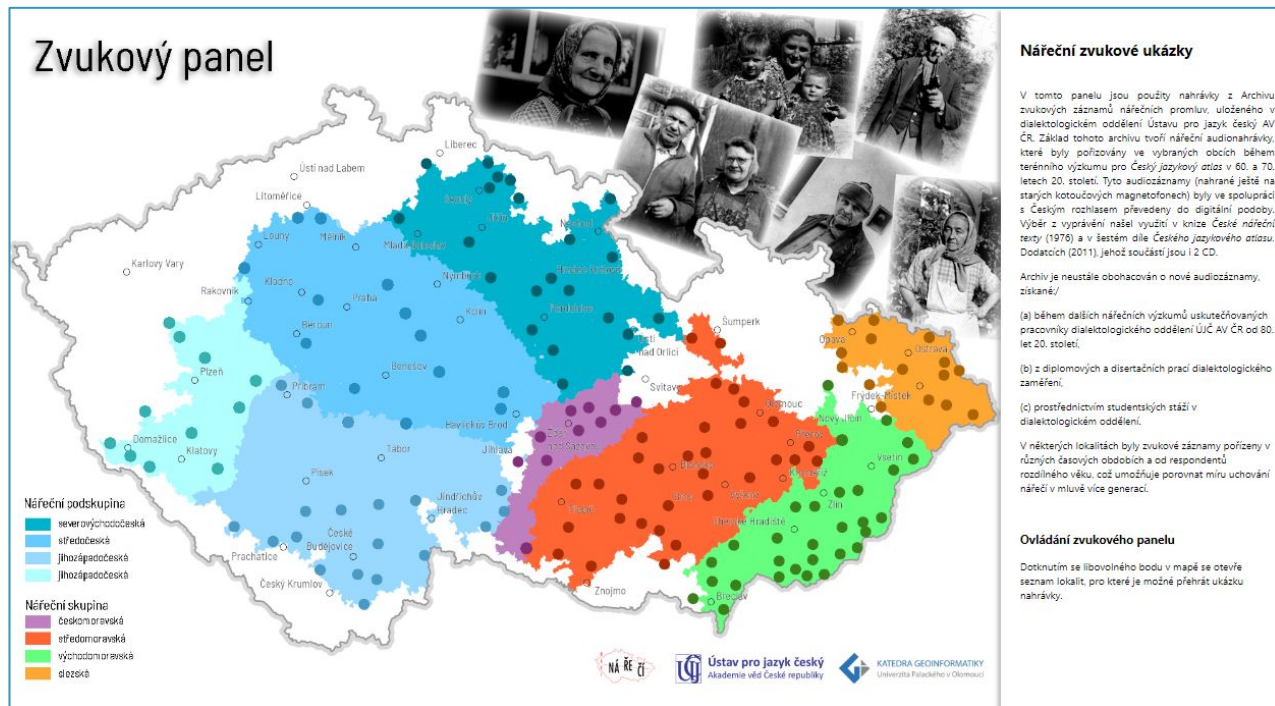
Geovisualization products

✓ Map animations



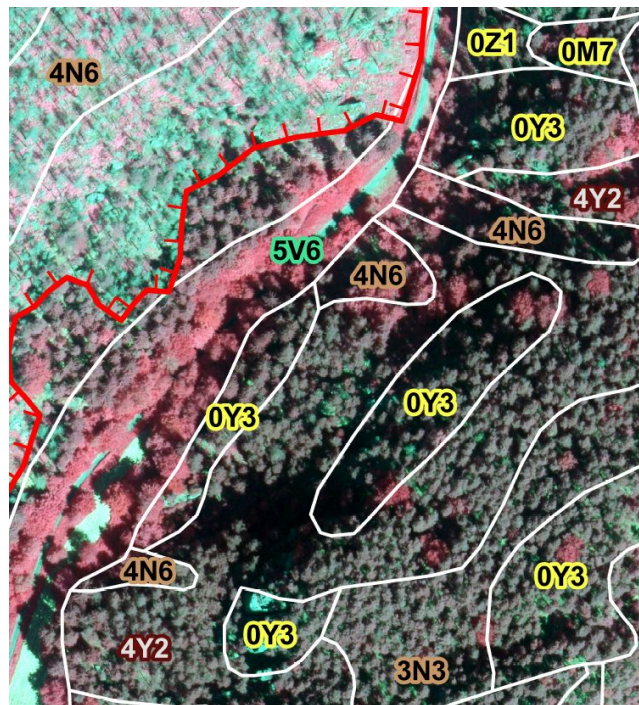
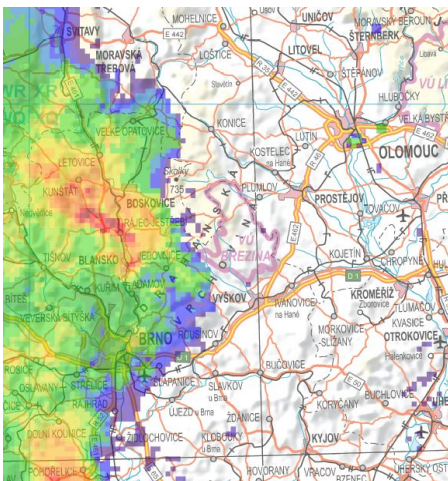
Geovisualization products

✓ Multimedia maps



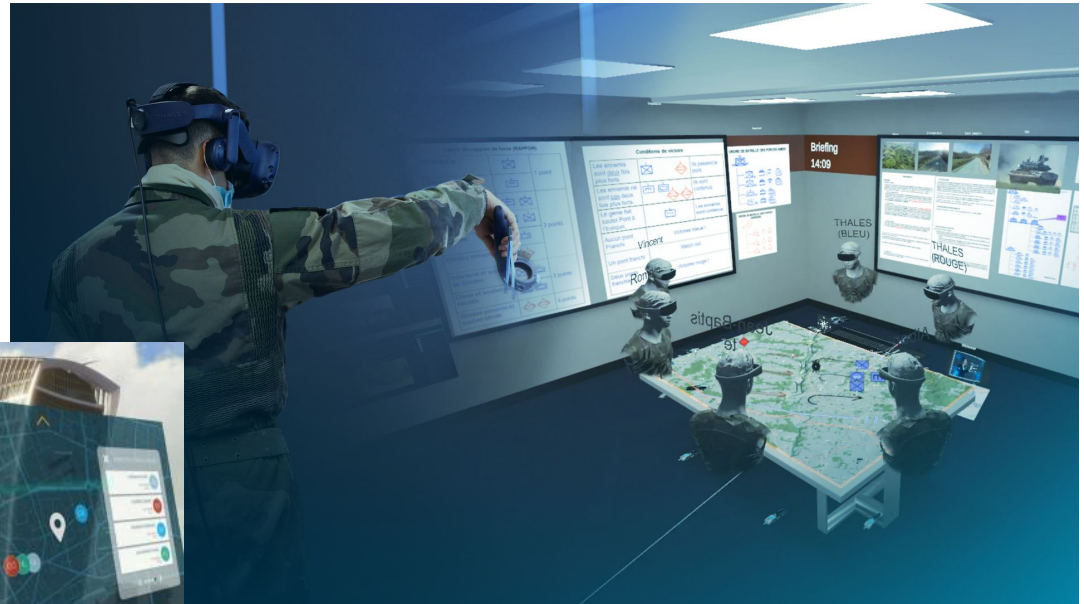
Geovisualization products

✓ Image maps



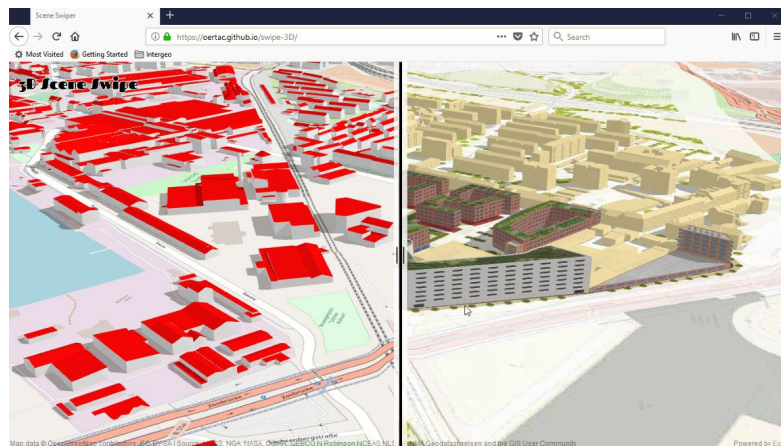
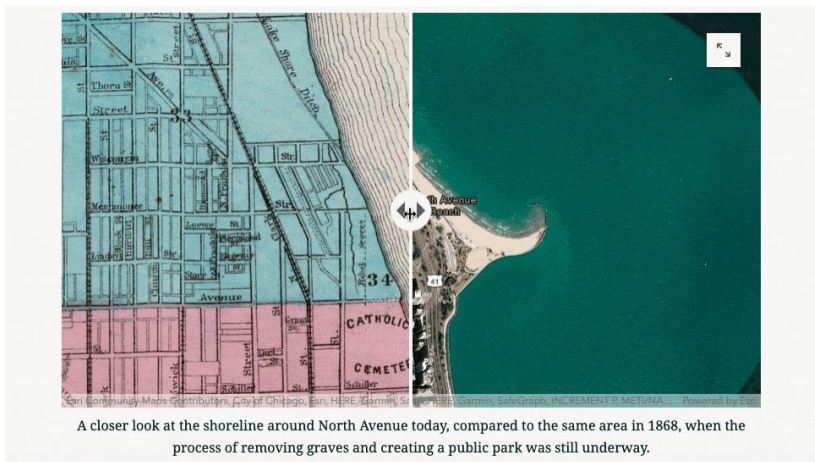
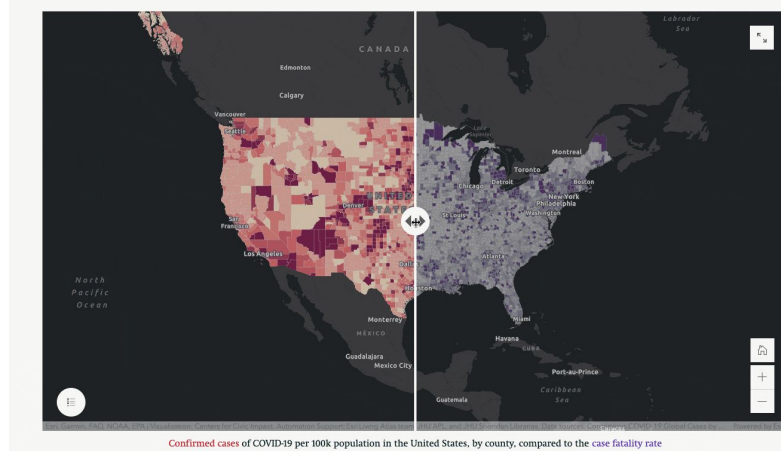
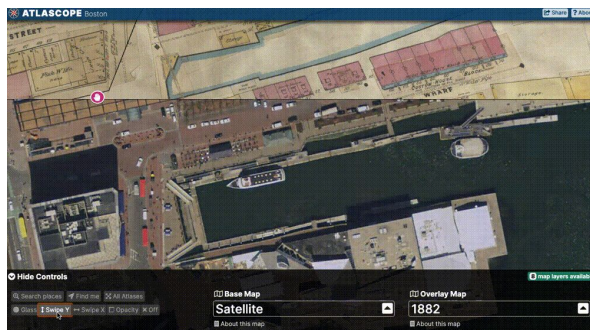
Geovisualization products

✔ Virtual maps



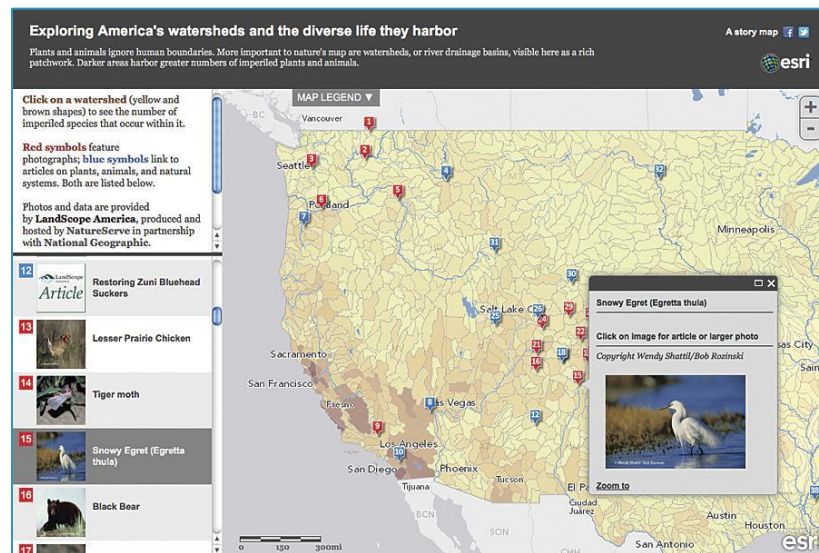
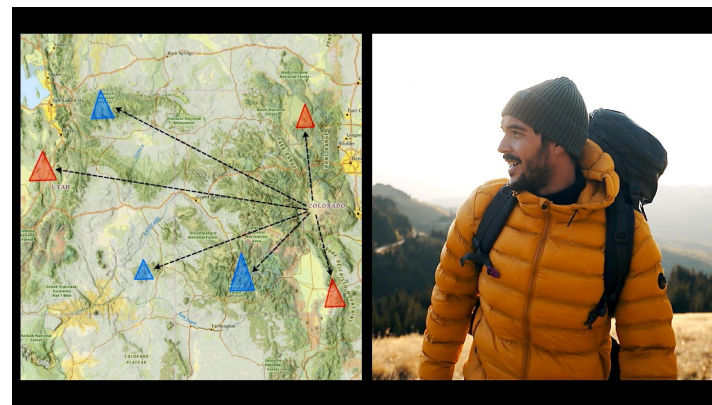
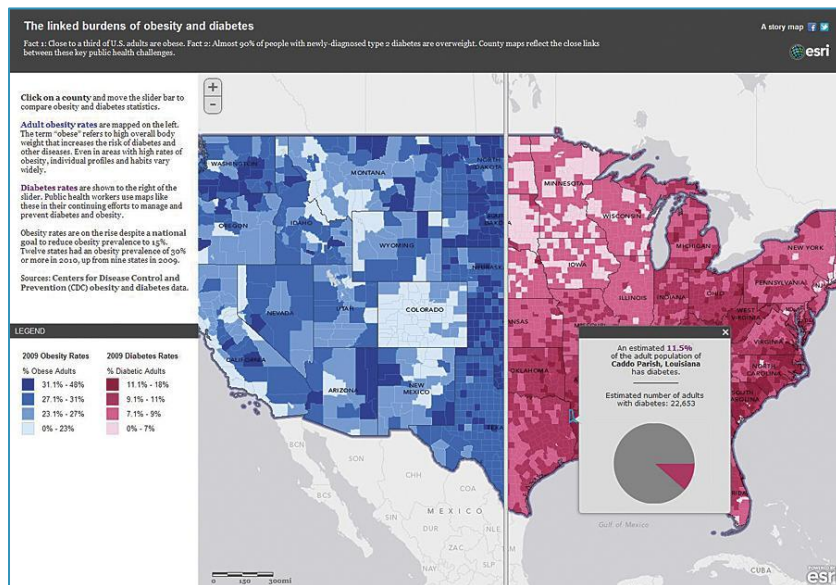
Geovisualization products

✓ Swipe map



Geovisualization products

✓ Story maps



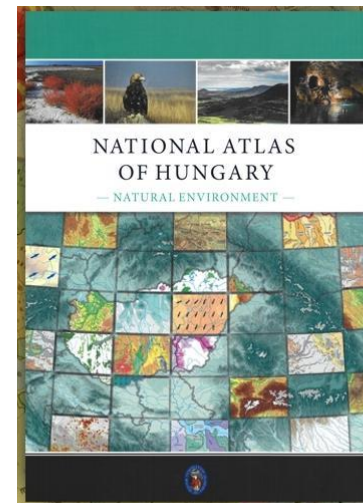
Geovisualization products

✓ Haptic maps



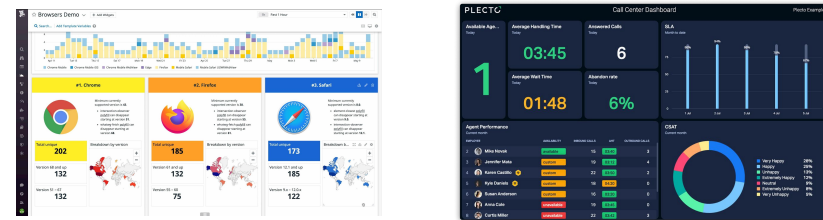
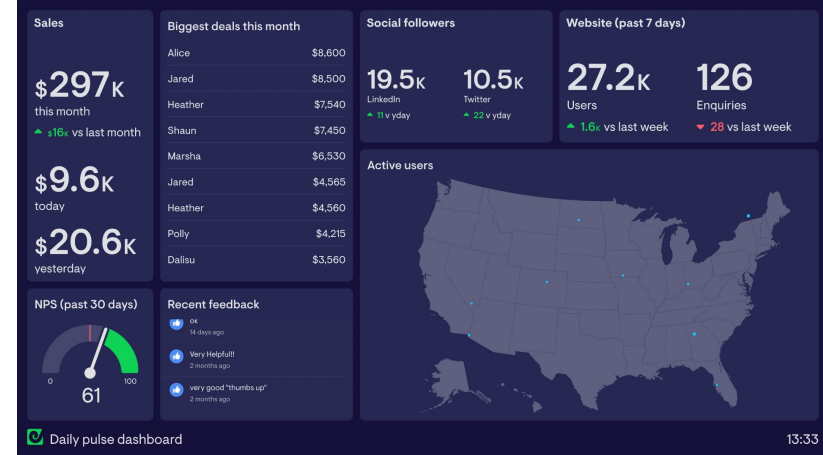
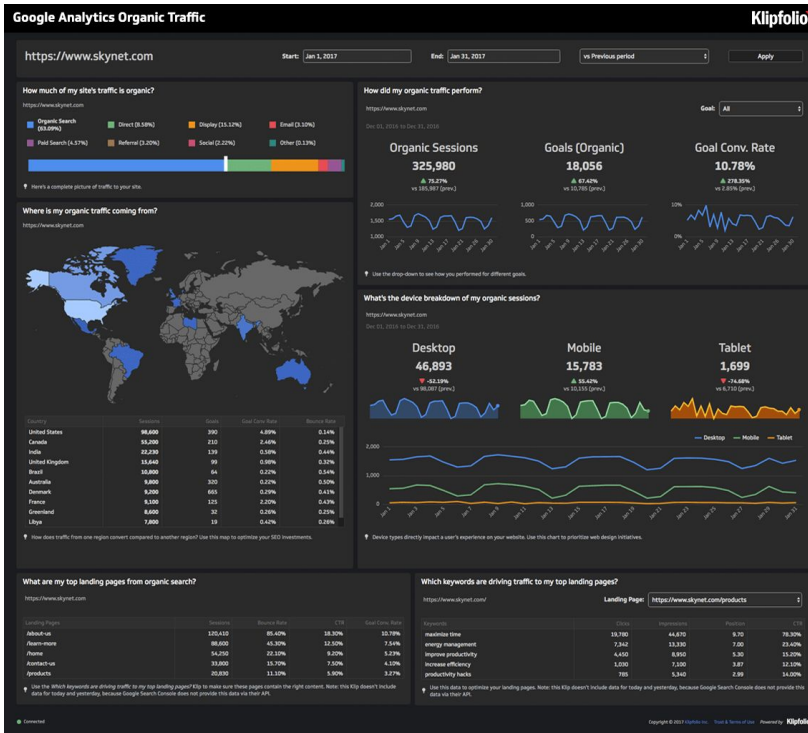
Geovisualization products

✓ Atlases



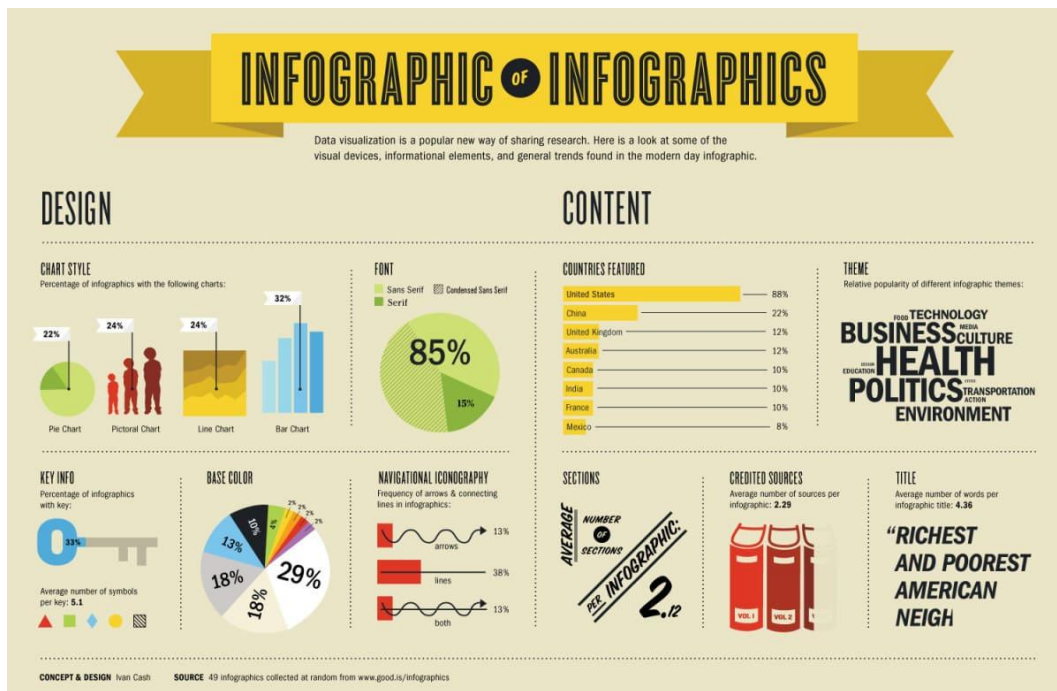
Geovisualization products

✓ Dashboards



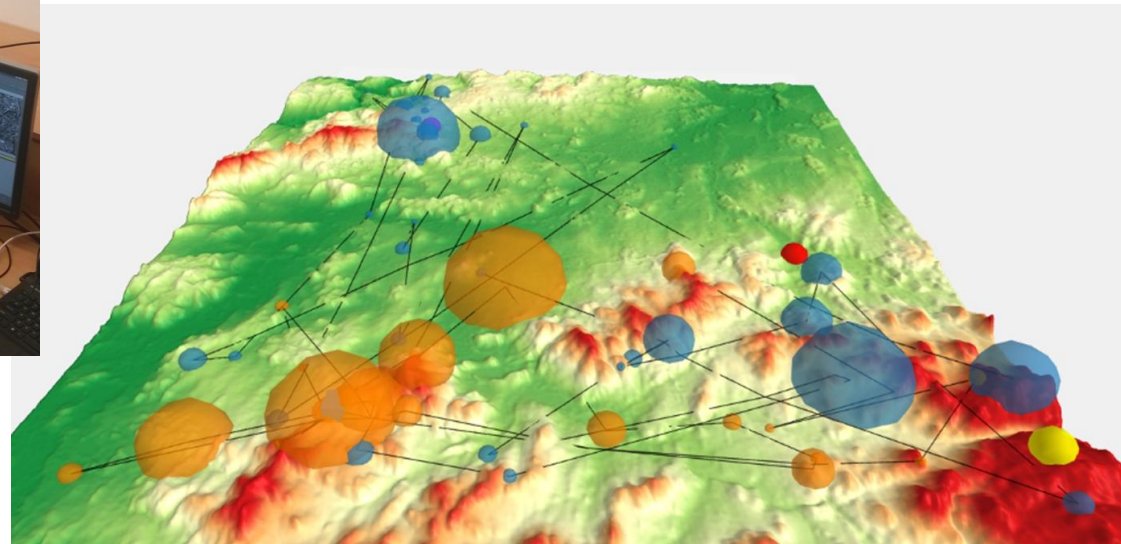
Geovisualization products

✓ Infographics



Geovisualization products

✓ User experiments



Principles of Geovisualization???

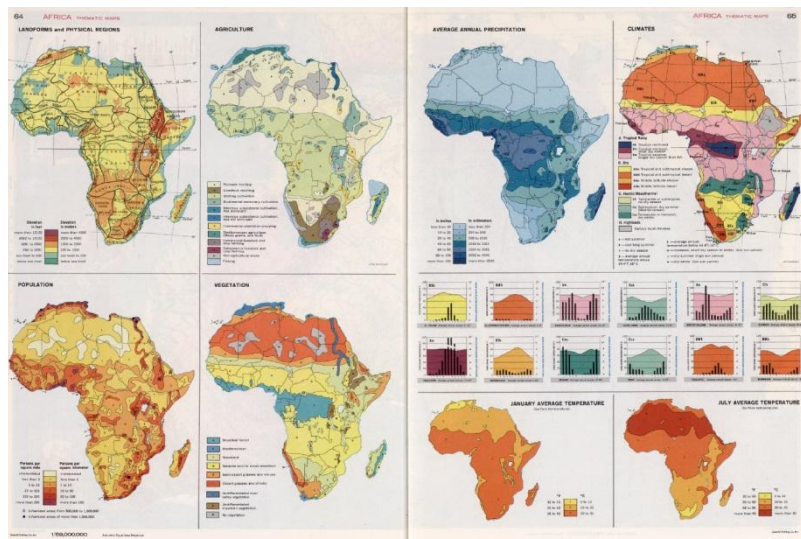
- ❑ forget what they told you about maps in surveying and remote sensing
- ❑ not one global school of cartography, but several different schools of cartography
- ❑ cartography gave rise to geoinformatics
- ❑ 80% of information is spatial
- ❑ three laws of geovisualization



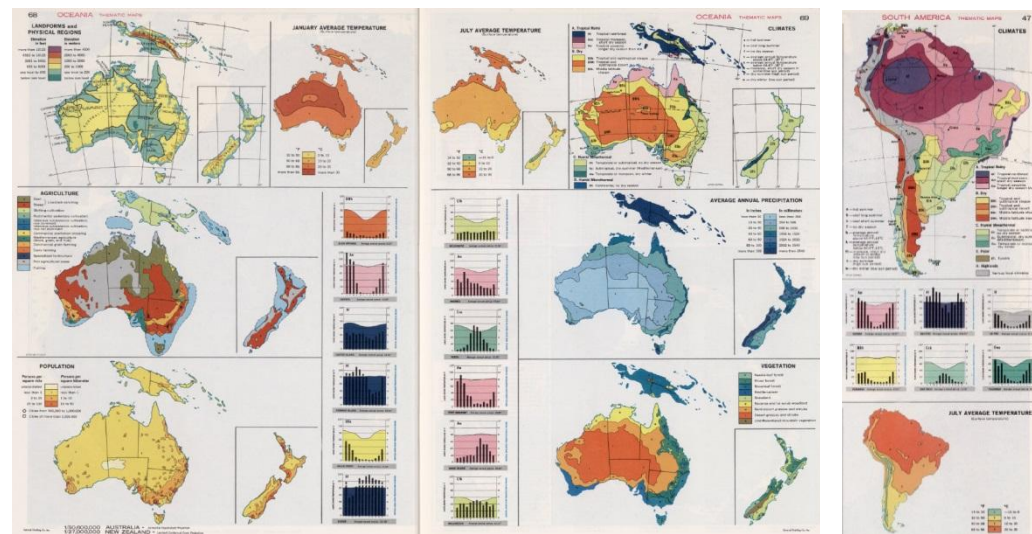
1st law of geovisualization

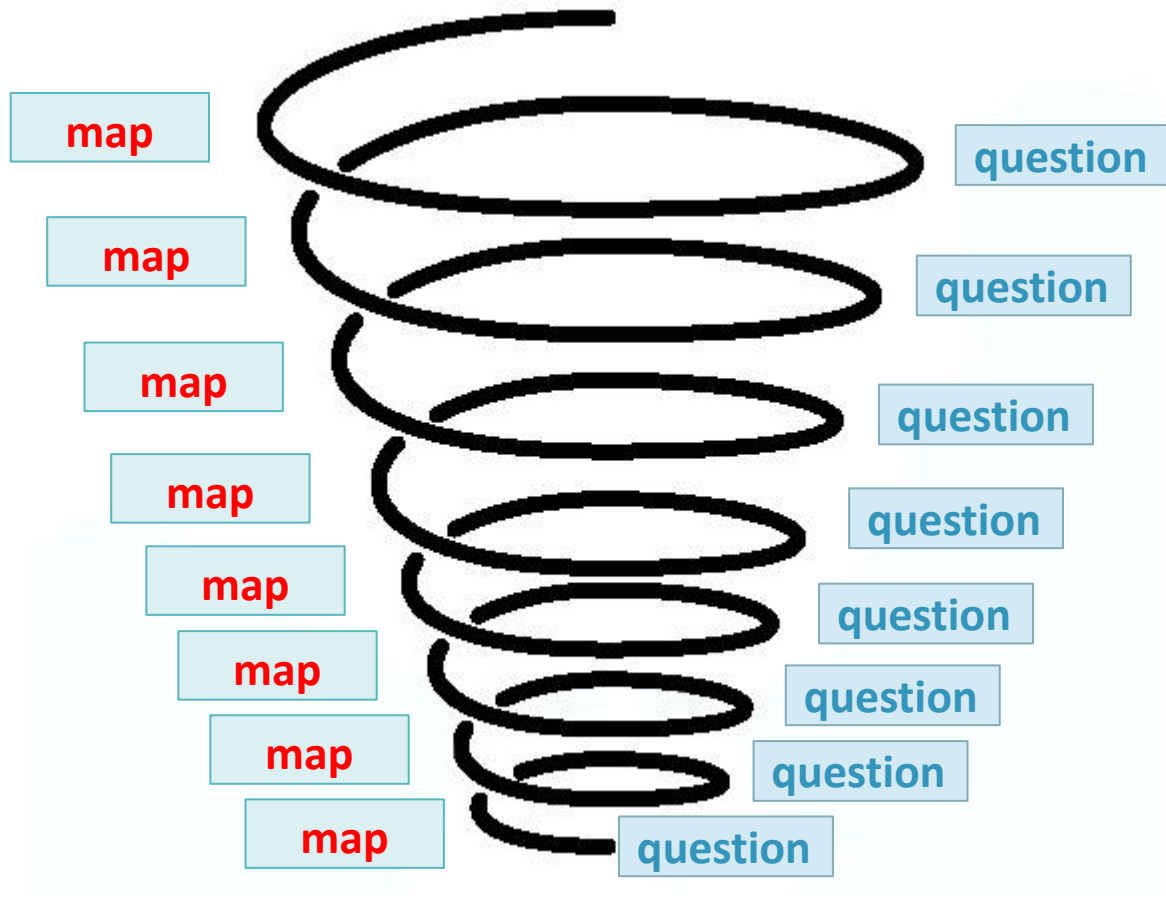
Principle of geographical space

What is spatial can be mapped



what can be mapped is spatial

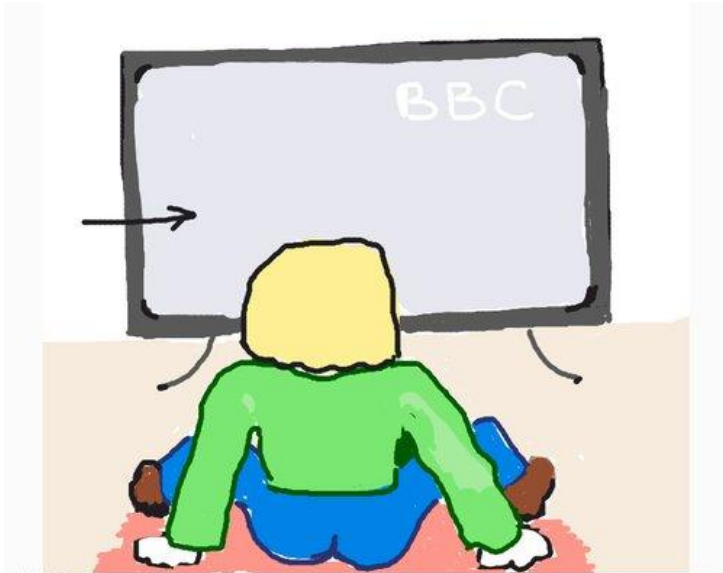




2nd law of geovisualization

Principle of concept

Think Before You Draw



GEOVISUALIZATION: MAP and CARTOGRAPHY

A **map** is a symbolized representation of geographical reality, representing selected features or characteristics, resulting from the creative effort of its author's execution of choices, and is designed for use when spatial relationships are of primary relevance.

Cartography is the discipline dealing with the art, science and technology of making and using maps.

photo vs. image vs. map



3rd law of geovisualization

Principle of map language

spatial phenomena
characteristics

cartographic symbol
variables

type of construction

name

age

importance

ability

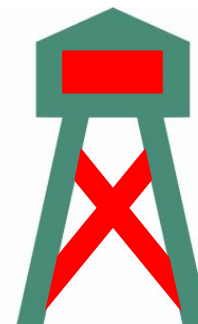
shape

size

fill

structure

label



Eifel
Tower



Visual variable



Jasques Bertin (1918-2010)
Semiologie Graphique (Semiology of Graphics) (1967)

	point	line	area		associative	selective	ordered	quantitative
				size		☺	☺	☺
				value		☺	☺	
				texture		☺	☺	
				colour	☺	☺		
				orientation	☺			
				shape	☺			

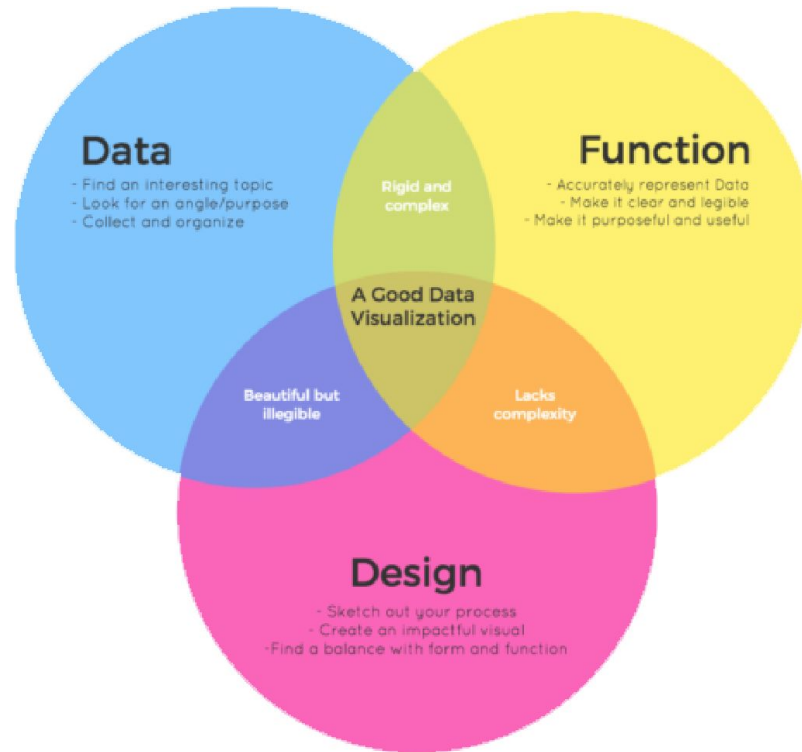


Dynamic visual variables

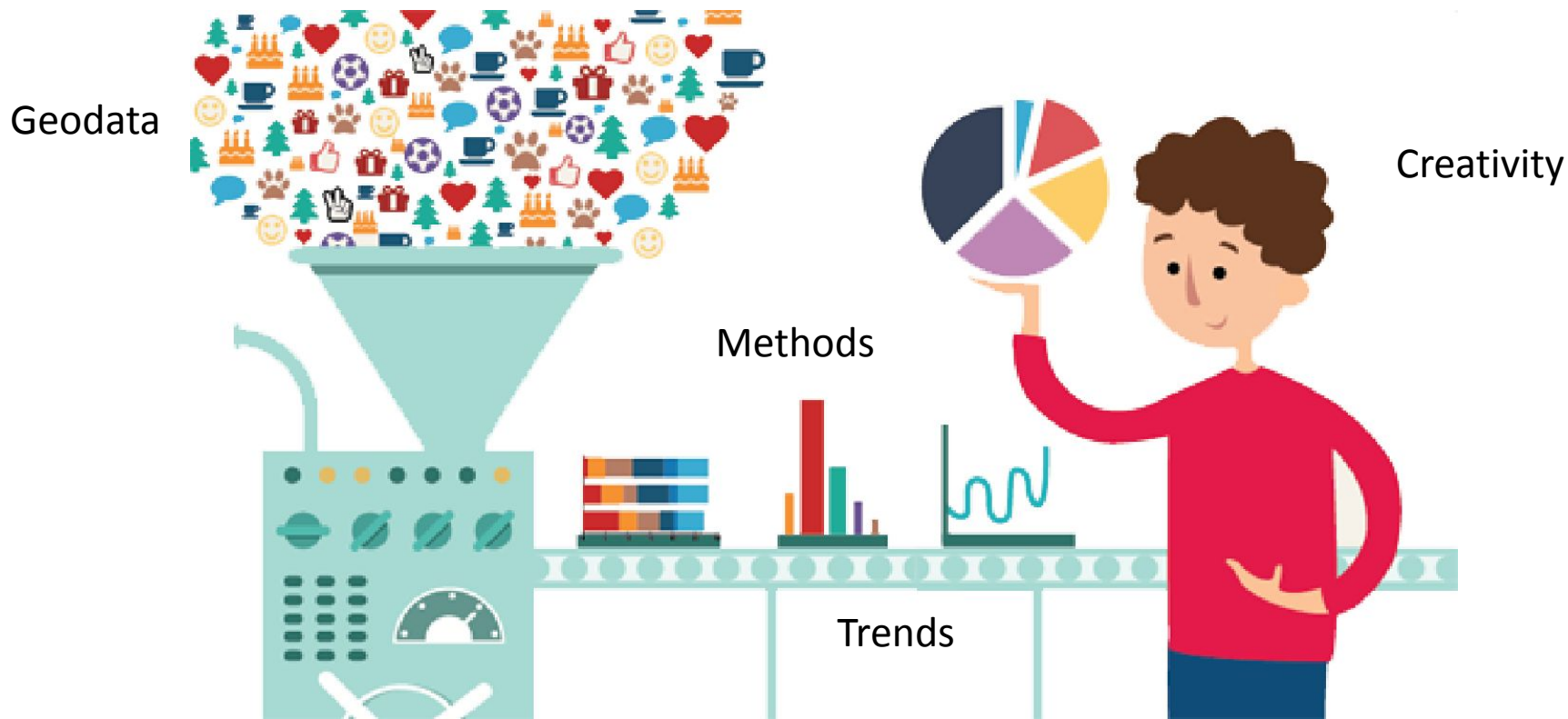
- ✓ visual variables can be used on the individual frames of an animation in such a way that these images effectively communicate the cartographic message to the user, while the movement of the animation gives the message an extra dimension and "new energy"
- ✓ using animated maps helped users grasp the contents of a message in a more effective manner compared to using traditional static maps
- ✓ six dynamic visual variables
 - ✓ moment
 - ✓ duration
 - ✓ frequency
 - ✓ order
 - ✓ rate of change
 - ✓ synchronisation



(geo)Data Visualization



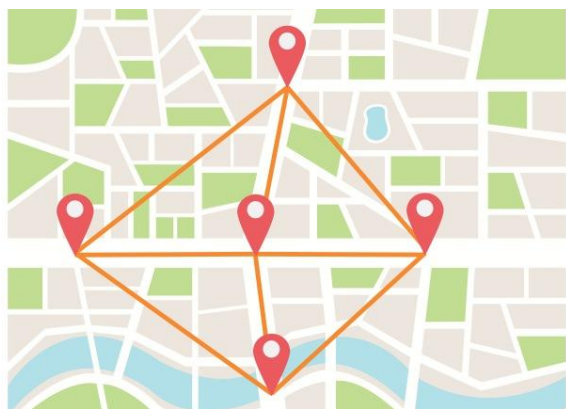
Data and Geodata Visualization



Geovisualization | Data

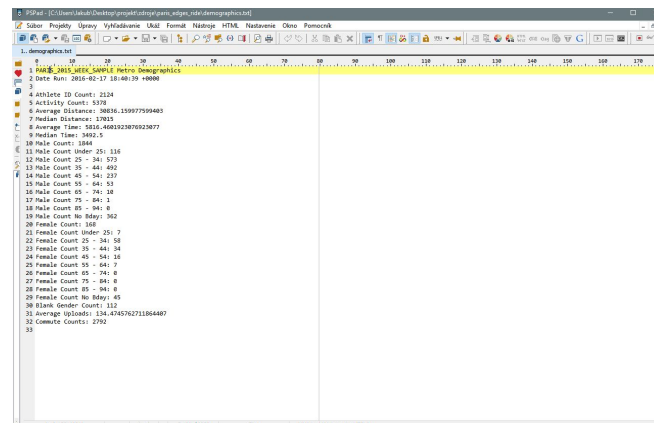
Spatial data (geodata)

- most information has a spatial context
 - inc. coordinates = precise location on the Earth

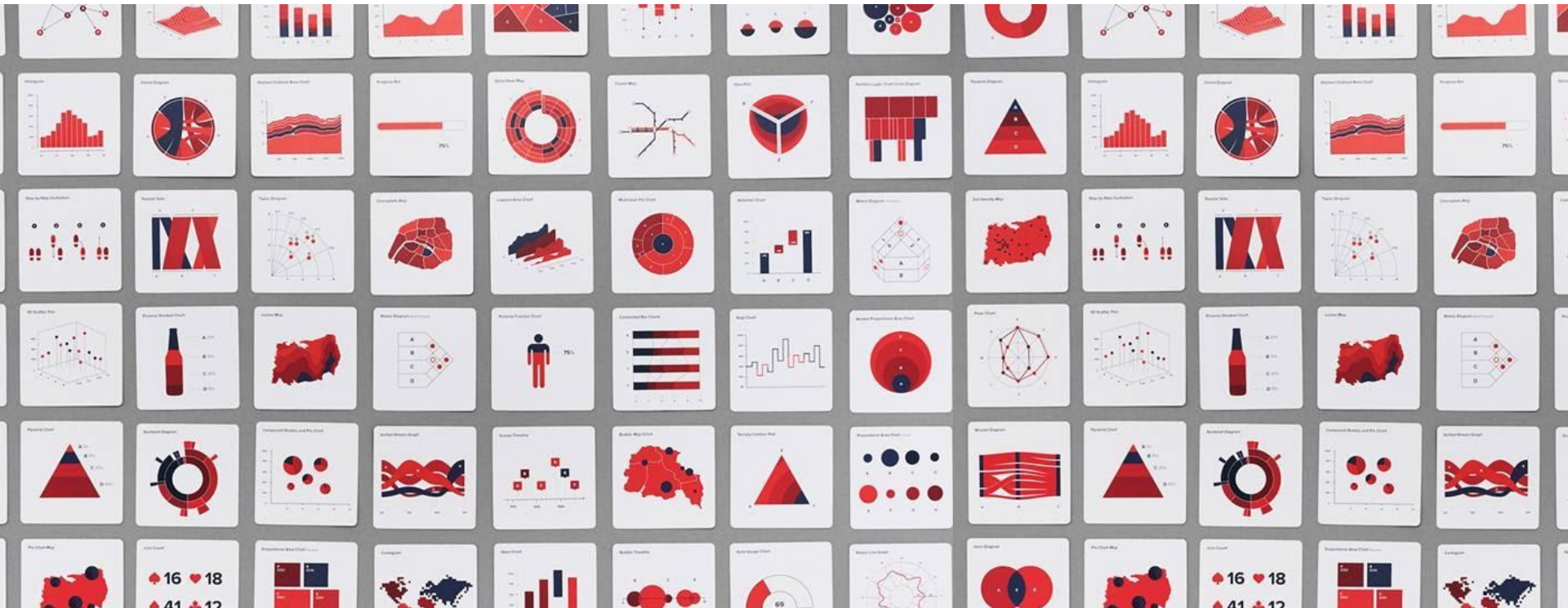


Non-Spatial data

- attribute data
 - additional information with explanatory meaning
- numbers, pictures, codes, etc.



Geovisualization | Methods



Geovisualization | Trends

Watch and follow trends

- ... to know how to do it
- ... to know how not to do it

- ... to do something **seasonal** – follow trends
- ... to do something **timeless** – do not follow trends

- ... to be **minimalistic** – „*beauty in simplicity*“
- ... to be **visual** – make visualisations and say it with pictures



Geovisualization | Trends

CREATIVE DESIGN

21 Graphic Design Trends and Predictions for 2019 and Beyond

Let's peek into the graphic design trends to watch in 2019.

1. Minimalistic Graphic Designs Will Gain Popularity



In the world of information overload and too much of clutter, sometimes it takes simple and straightforward design to catch the attention of your target audience. Graphic designers are increasingly doing away with unnecessary design elements that take away the essence of the brand. Instead, they are opting for simple yet powerful designs that convey the message succinctly.

2. Asymmetric and Unusual Layouts Will Be in Demand



There was a time when a website or an advertisement almost had a predictable layout, but in 2019, we would see more of scattered grid style layouts where information is not where you would usually expect it to be. Designers are willing to break the old patterns and open-up the doors for newer and more creative layouts to catch the attention of today's millennials and also to make the audience enjoy the content discovery process.

3. Chaotic Designs and Typography



This is perhaps the most minimalistic of what is on the right target.

4. Attractive Color Transitions and



With vast in greater vari

The next trends in graphic design, according to five experts

Emma Norris

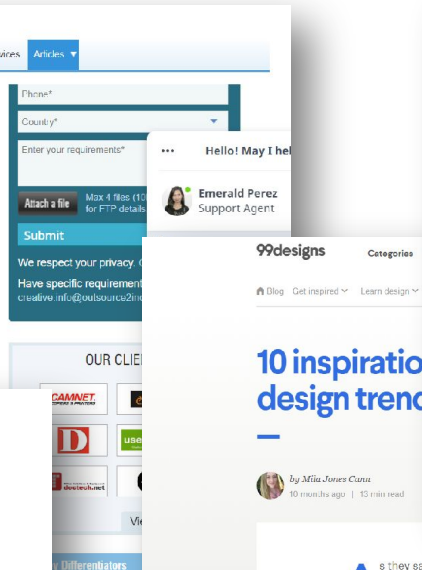
The design world moves rapidly—perhaps more so than any other industry. In the age of social media, aesthetic trends explode and proliferate quickly—only to disappear faster than you can say “marble and millennial pink.”

Nobody knows this better than design experts. Graphic, website and brand designers must always stay on the pulse of up-and-coming design trends so that they can ensure their client's visual identity translates to a modern audience. So, we figured who better to ask about the next big trends in design than these visual pioneers themselves?

Here, we ask five design experts about the aesthetic trends to look out for—and how you can use them yourself to create bold and engaging Camsa designs.

01. Gradients

Connie Helen, Digital Designer at [Live Happy Magazine](#) and Designer and Digital Strategist at [Pixelity Design](#)



10 inspiration design trend

By Milia Jones Curtis
10 months ago | 13 min read

Top Graphic Design Trends 2018: The Ultimate Guide

By Lisa ...
11 months ago

557,966 views



In the era of digital art, graphic design trends can evaporate as quickly as they emerged. What has been modern for the past few years may look entirely outdated in 2018. While some trends have stood the test of time, others have vanished in the blink of an eye only to make room for new modern looks. So, if you are looking for an **antonym of boring, this would be - graphic design trends 2018.**

Graphic design trends 2018 are:

- 1 The "Glitch" Effect
- 2 The "Ruined" Effect
- 3 "Color Channels" Effects
- 4 Double Exposure

Browse High Quality Vector Graphics
E.g. business cards, logos, etc.

Search...



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Related Articles

15 Incredible Character Design Books of the Year!

As they say, "everything old is new again," and 2018 will be a year of modernizing graphic design trends from the past and diverging from the (literally) flat design landscape of recent years. Minimalism and simplification will stick around, but expect to see some old favorites make their return to the limelight with modern, updated looks.

If you're feeling fashionable and want to add some contemporary flair to your designs, check out these 10 graphic design trends that will wow your customers in 2018.

Here are 10 graphic design trends to watch in 2018

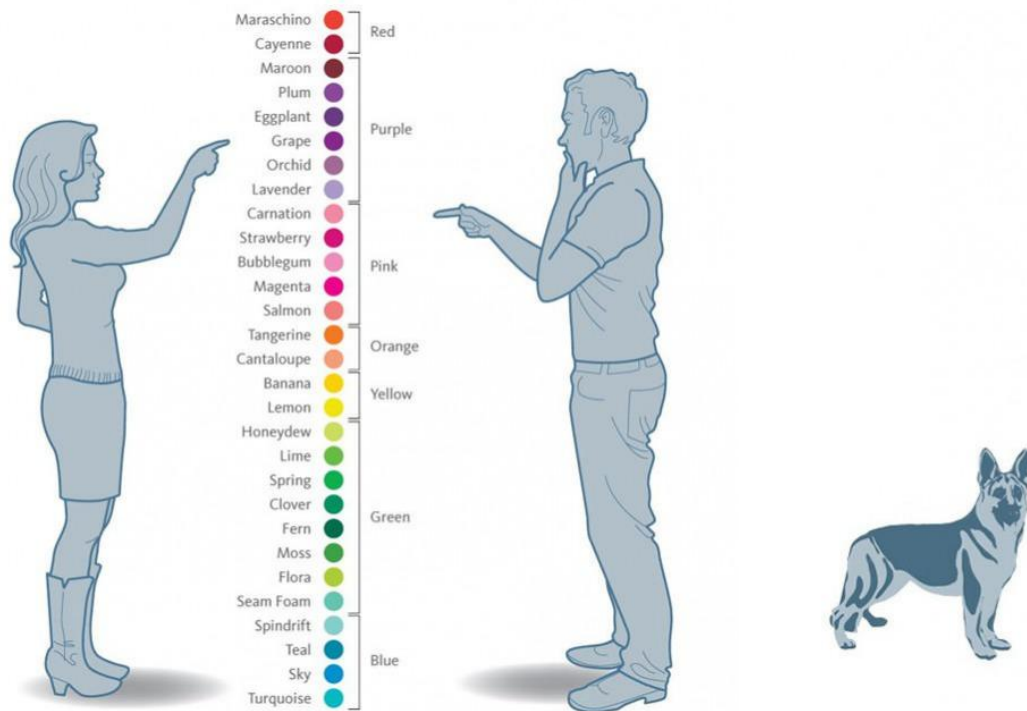


COLOR EMOTION GUIDE



- **Yellow** represents optimism, warmth, and clarity
- **Orange** represents confidence (for pay attention)
- **Red** represents urgency, sexy, exciting and passion
- **Purple** represents royalty and trust
- **Blue** represents streng
- **Green** represents growth and moneyth and calmness
- **Black** represents elegance, sophistication, and class

Geovisualization | Colours



- Gray #f94433
- Gray #ac203b
- Gray #85343d
- Gray #874994
- Gray #663c84
- Gray #8c2590
- Gray #a16799
- Gray #af99c7
- Gray #f38da3
- Gray #d2157b
- Gray #ec90b7
- Gray #e90086
- Gray #f57d7e
- Gray #f27727
- Gray #fc9b7b
- Gray #f7d305
- Gray #f1e311
- Gray #ccd6f2
- Gray #68bd46
- Gray #0aae4f
- Gray #069665
- Gray #057054
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- Gray #0fb8b5



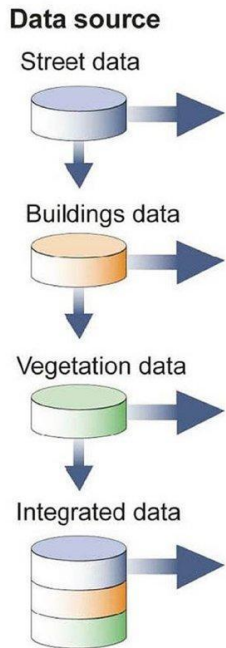
Jakub Konicek's quiz | Guess the most expensive logo!

The quiz displays ten logos arranged in a grid. Each logo is accompanied by a blue bubble containing its estimated value in US dollars. The logos and their values are: Microsoft (\$0), Pepsi (\$1,000,000), ANZ (\$15,800,000), Nike (\$0), Twitter (\$15), BBC (\$1,800,000), accenture (\$100,000,000), Coca-Cola (\$0), Google (\$0), London 2012 (\$625,000), and bp (\$211,000,000).

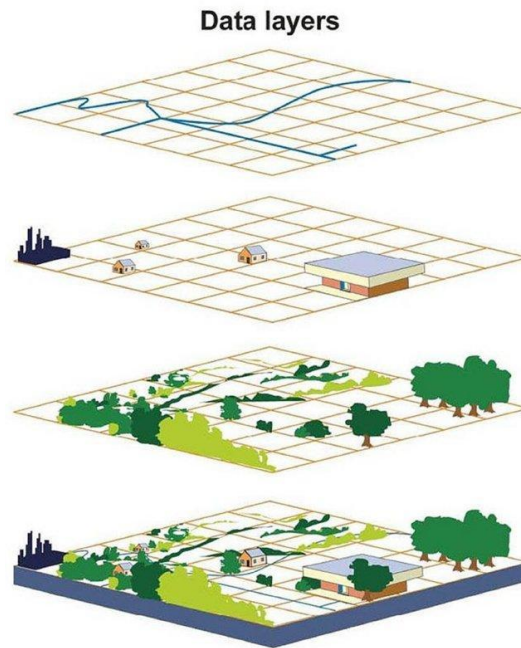
Logo	Estimated Value
Microsoft	\$0
Pepsi	\$1 000 000
ANZ	\$15 800 000
Nike	\$0
Twitter	\$15
BBC	\$1 800 000
accenture	\$100 000 000
Coca-Cola	\$0
Google	\$0
London 2012	\$625 000
bp	\$211 000 000

How to make an attractive geovisualization

Spatial data



GIS



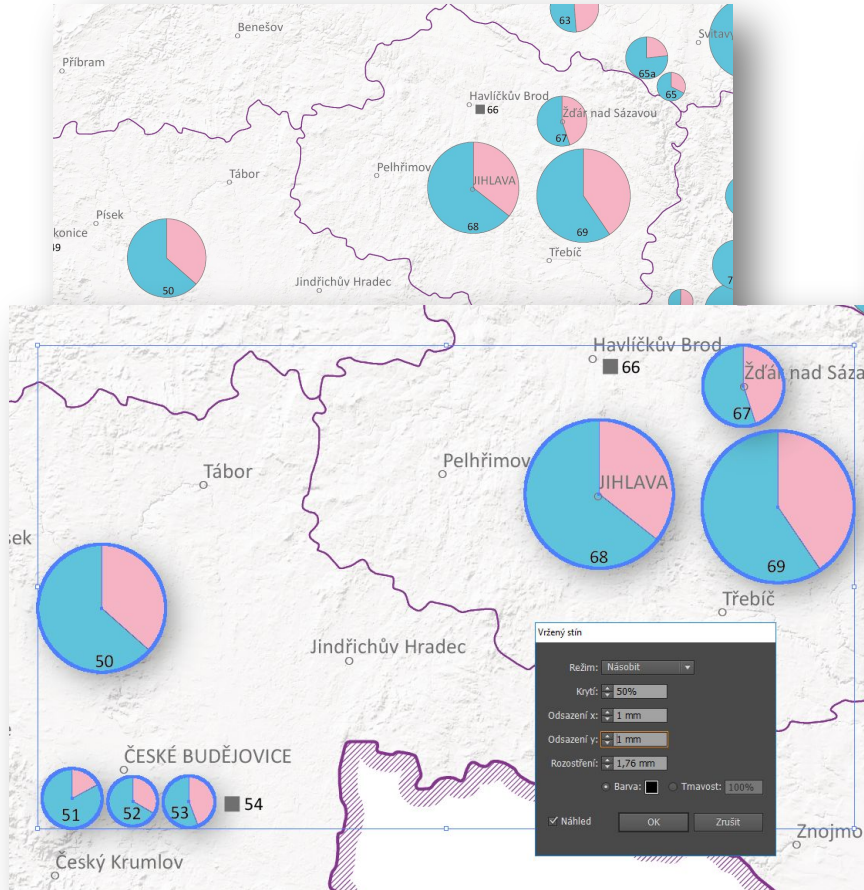
(Vector)-friendly SW



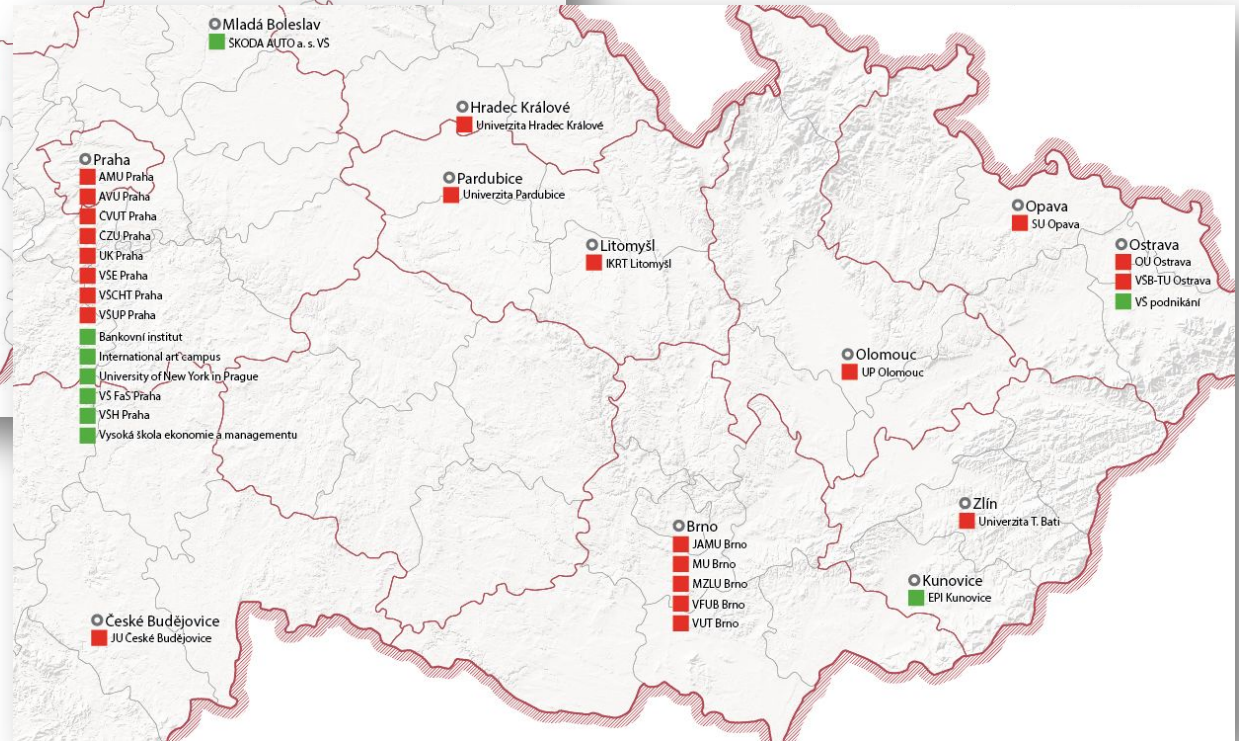
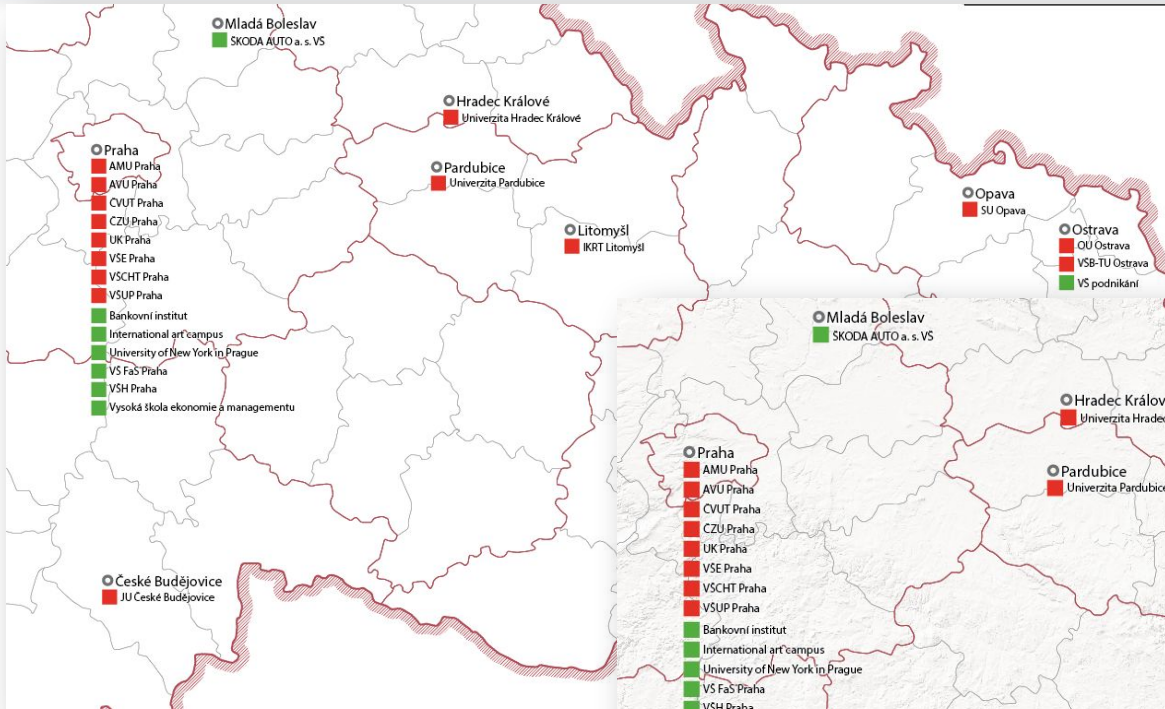
DESIGNER'S LIFE



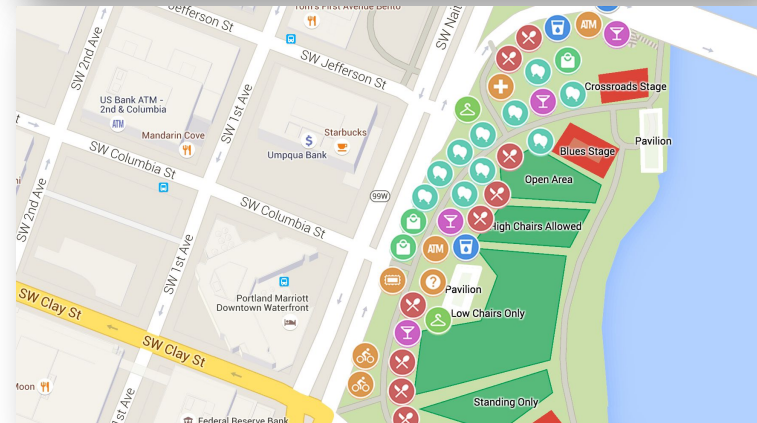
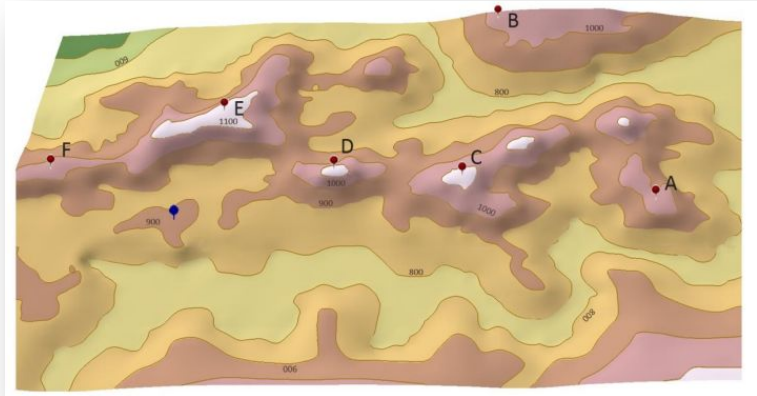
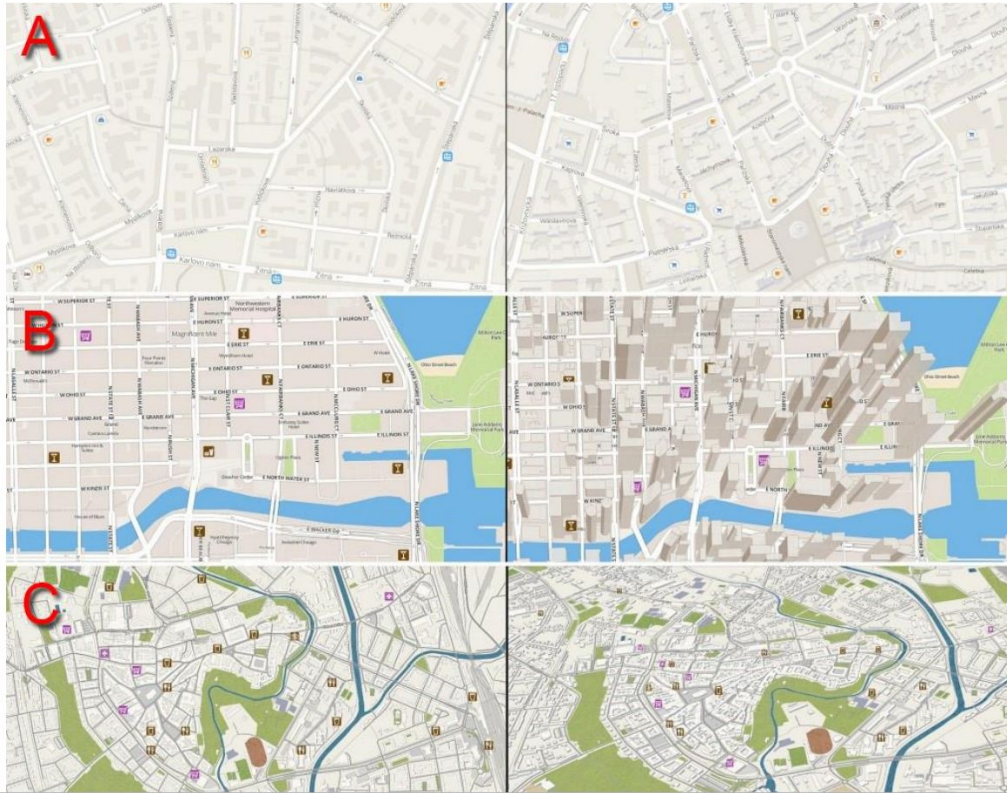
How to make an attractive geovisualization | Tips (shadows)



n | Tips (shadows)

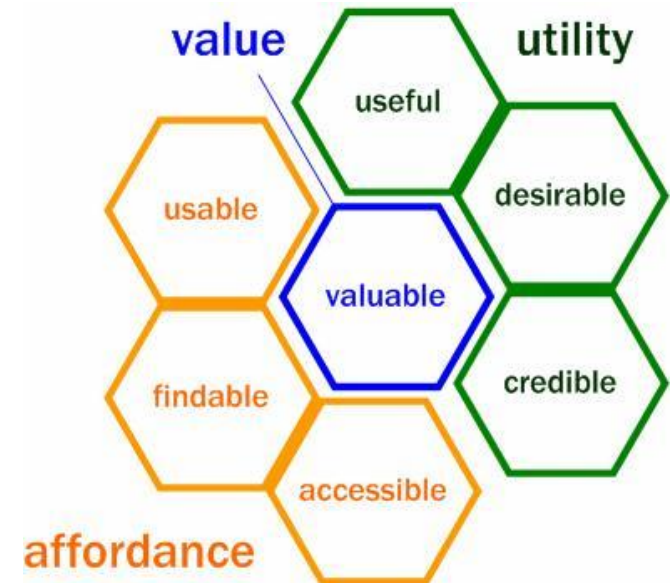


How to make an attractive geovisualization | Tips (3D)



Add more **attributes** and promote **information**

- transform an **attribute** information to the graphical visualization
- **spatial / non-spatial** visualization
- use proper and correct methods
- think carefully

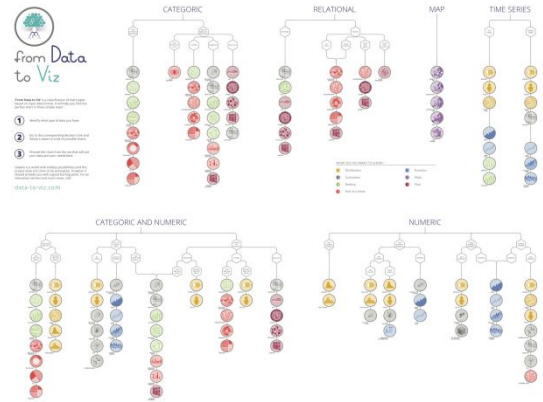
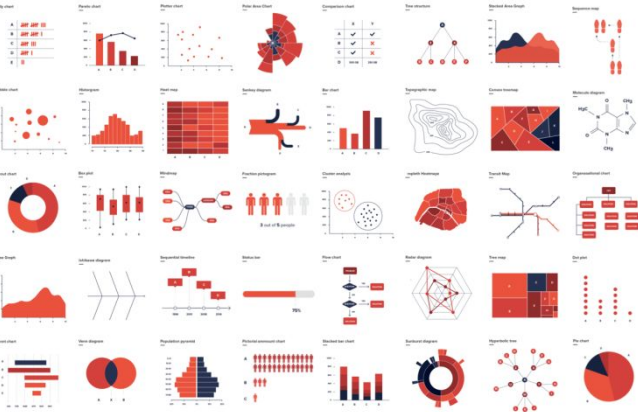


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<https://datavizproject.com/>








<https://www.data-to-viz.com/>

<https://datavizcatalogue.com/>










The Elements of Design

(the tools to make art)

Line		Horizontal, vertical, diagonal Straight, curved, dotted, broken Thick, thin
Shape		2D (two dimensional)/ flat Geometric (square, circle, oval, triangle) Organic (all other shapes)
Form		3D (three dimensional) Geometric (cube, sphere, cone) Organic (all other forms such as: people, animals, tables, chairs, etc)
Colour		Refers to the wavelengths of light Refers to hue (name), value (lightness/darkness), intensity (saturation, or amount of pigment), and temperature (warm and cool) Relates to tint, tone and shade
Texture		The feel, appearance, thickness, or stickiness of a surface (for example: smooth, rough, silky, furry)
Space		The area around, within, or between images or parts of an image Relates to perspective Positive and negative space
Value		The darkness or lightness of a color. White added to a color makes it a <i>tint</i> . Black added to a color makes it a <i>shade</i> .

The Principles of Design

(how to use the tools to make art)

Pattern		A regular arrangement of alternated or repeated elements (shapes, lines, colours) or motifs.
Contrast		The juxtaposition of different elements of design (for example: rough and smooth textures, dark and light values) in order to highlight their differences and/or create visual interest, or a focal point.
Emphasis		Special attention/importance given to one part of a work of art (for example, a dark shape in a light composition). Emphasis can be achieved through placement, contrast, colour, size, repetition... Relates to focal point.
Balance		A feeling of balance results when the elements of design are arranged symmetrically or asymmetrically to create the impression of equality in weight or importance.
Proportion/ Scale		The relationship between objects with respect to size, number, and so on, including the relation between parts of a whole.
Harmony		The arrangement of elements to give the viewer the feeling that all the parts of the piece form a coherent whole.
Rhythm/ Movement		The use of recurring elements to direct the movement of the eye through the artwork. There are five kinds of rhythm: random, regular, alternating, progressive, and flowing. The way the elements are organized to lead the eye to the focal area. Movement can be directed for example, along edges and by means of shape and colour.

Statistical oriented

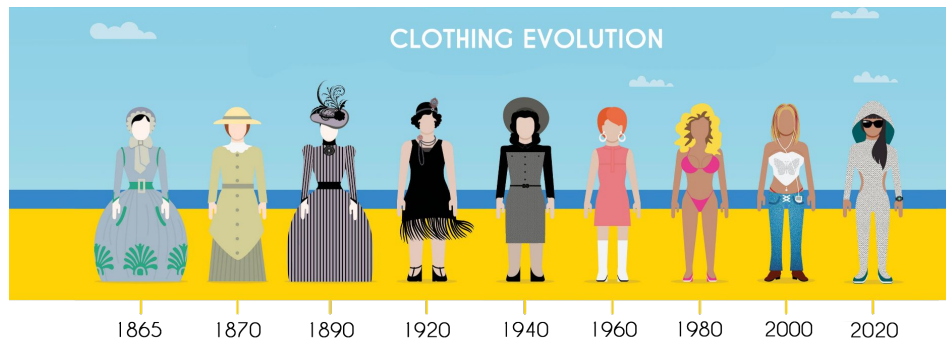
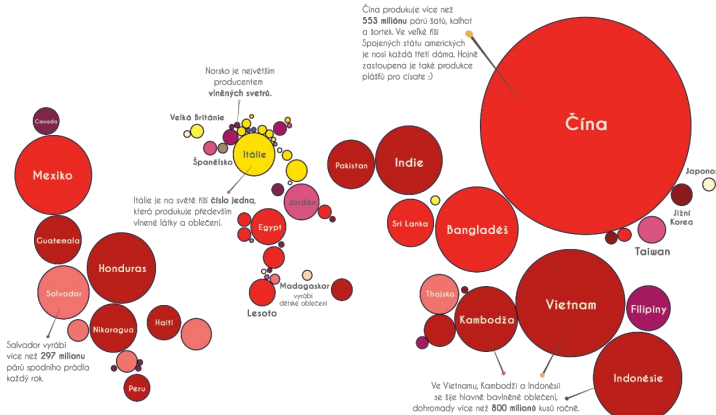
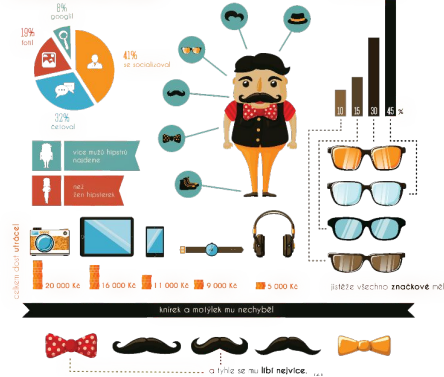
Time oriented

Geography oriented

Process based

BYL JEDNOU JEDEN HIPSTER

Co dělal se svým časem?



Where to find...

Data

Colors

- <http://colorbrewer2.org/>
- <https://coolours.co/>
<https://color.adobe.>
<https://brandcolors.net/>

Free pictures

- <https://www.sitebuilderreport.com/stock-up>
- <http://www.resplashed.comhttps://www.pexels.com/>
- <https://www.toptal.com/designers/subtlepatterns/>
- <https://www.videvo.net/>
<https://www.fiverr.com/>

Free vectors

- <http://www.freepik.com/>
- <https://www.designermill.comhttp://freebbble.com/>
- <http://www.fribbble.com/>
<https://pixelbuddha.net/>
- <https://www.flaticon.com/>

Tools

- <http://datavizproject.com>
<https://piktochart.com/>
<https://www.sumopaint.com/home>
- <https://www.canva.com/create/info-graphics/>
- <https://venngage.com/>
- <http://www.creativebloq.com/infographic/tools-2131971>
- <https://infogr.am/>
- <https://www.ease.ly/>
- <https://www.fiverr.com/>
- <https://www.sitebuilderreport.com/>
- <https://www.webydo.com/>
- <https://pablo.buffer.com/>
- <https://placeit.net/>
- <http://www.recitethis.com/>
- <https://chartlr.com/>
- <http://mkweb.bcgsc.ca/tableviewer>
- <https://www.webydo.com>

Inspiration

- <http://www.informationisbeautiful.net/>
- <https://www.revolv.com/>
- <https://bost.ocks.org/mike/http://faculty.nps.edu/rdfricke/docs/Visualizing%20HSCB%20Data.pdf>
- <http://www.swissinfographics.com/archives/524>
- <http://infowetrust.com/tag/classicviz/>
- <http://www.datavis.ca/milestones/>
- <http://guides.co/search?q=infographic>
- <https://ourworldindata.org/>
<https://www.oddiviz.com/>
- <http://www.datasketch.es/>
- <http://visualoop.com>



Thank you for your attention.



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