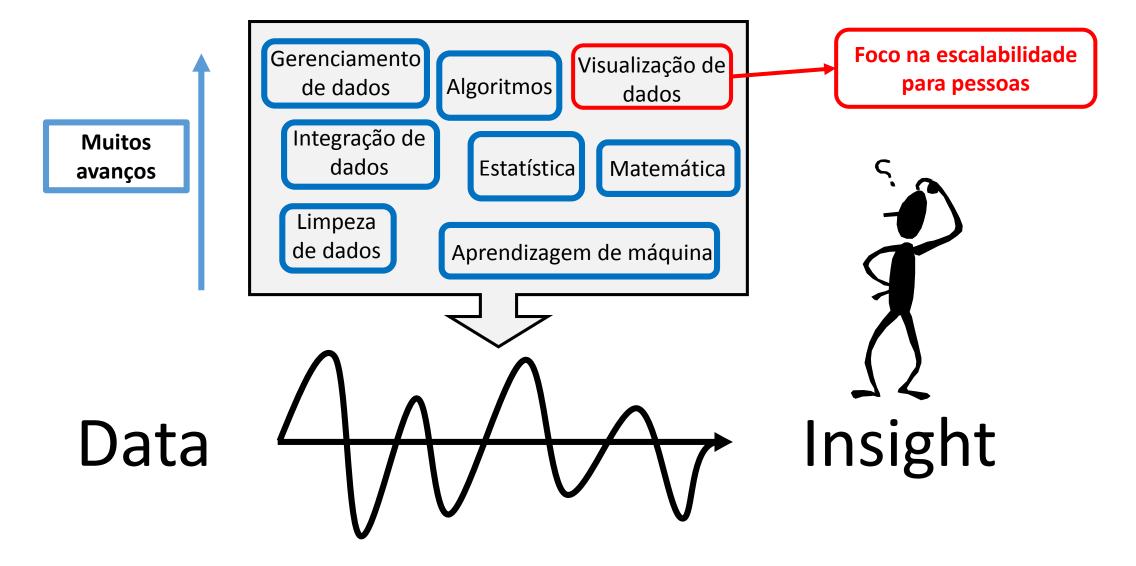
Visualização de Dados

Introdução Aula 1

Por que Aprender Visualização de Dados?



Análise de Dados



Visualização de Dados para Data Science

"The ability to take data - to be able to understand it, to process it, to extract value from it, to visualize it, to communicate it's going to be a hugely important skill in the next decades. Because now we really do have essentially free and ubiquitous data. So the complimentary scarce factor is the ability to understand that data and extract value from it."



Hal Varian, Chief Economist of Google veja artigo na íntegra: <u>link</u>





Office of Science and Technology Policy Executive Office of the President New Executive Office Building Washington, DC 20502

FOR IMMEDIATE RELEASE March 29, 2012

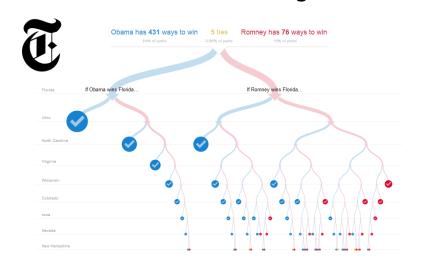
Contact: Rick Weiss 202 456-6037 rweiss@ostp.eop.gov Lisa-Joy Zgorski 703 292-8311 lisajoy@nsf.gov

OBAMA ADMINISTRATION UNVEILS "BIG DATA" INITIATIVE: ANNOUNCES \$200 MILLION IN NEW R&D INVESTMENTS

Aiming to make the most of the fast-growing volume of digital data, the Obama Administration today announced a "Big Data Research and Development Initiative." By improving our ability to extract knowledge and insights from large and complex collections of digital data, the initiative promises to help solve some the Nation's most pressing challenges.

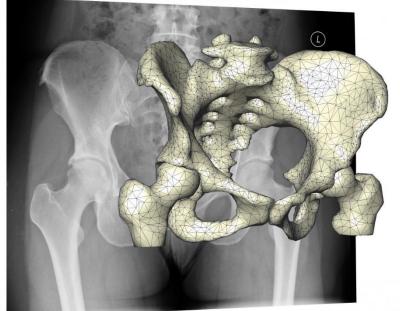
To launch the initiative, six Federal departments and agencies today announced more

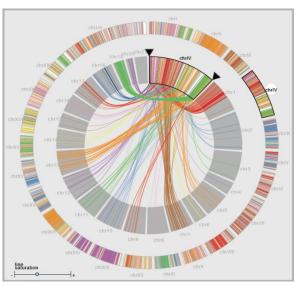
Visualização de Dados em Toda Parte

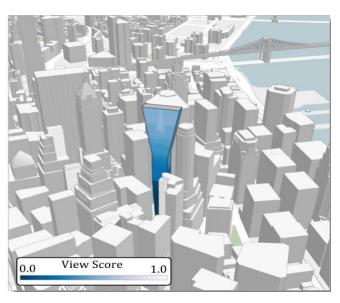












O que é Visualização de Dados?

Visualização de Dados

O uso de representações visuais de dados, suportadas por computadores, para amplificar a cognição

Readings in Information Visualization: Using Vision to Think By Stuart K. Card, Jock D. Mackinlay, Ben Shneiderman

Visualização de Dados

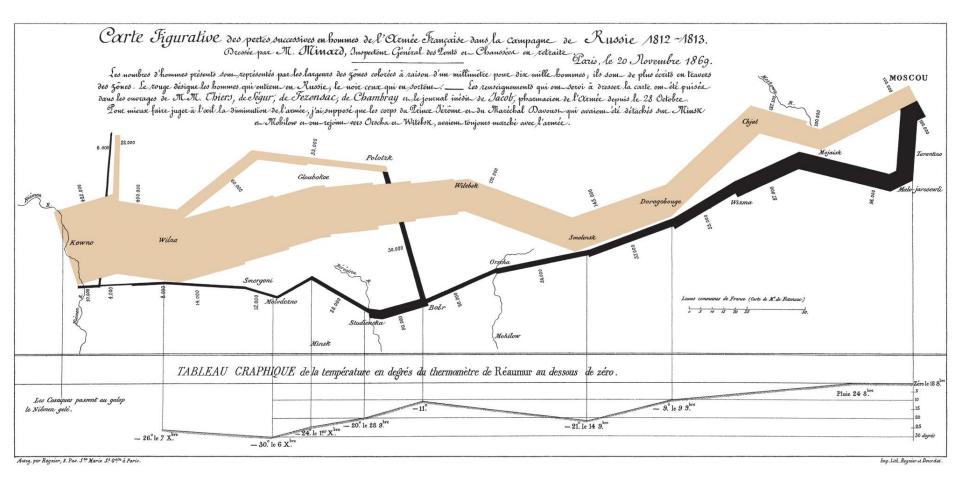
O uso de representações visuais de dados, suportadas por computadores, para amplificar a cognição

Readings in Information Visualization: Using Vision to Think
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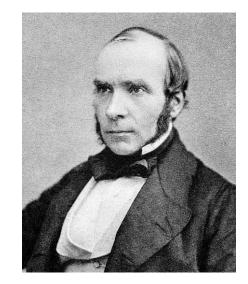
Há Muito Tempo!



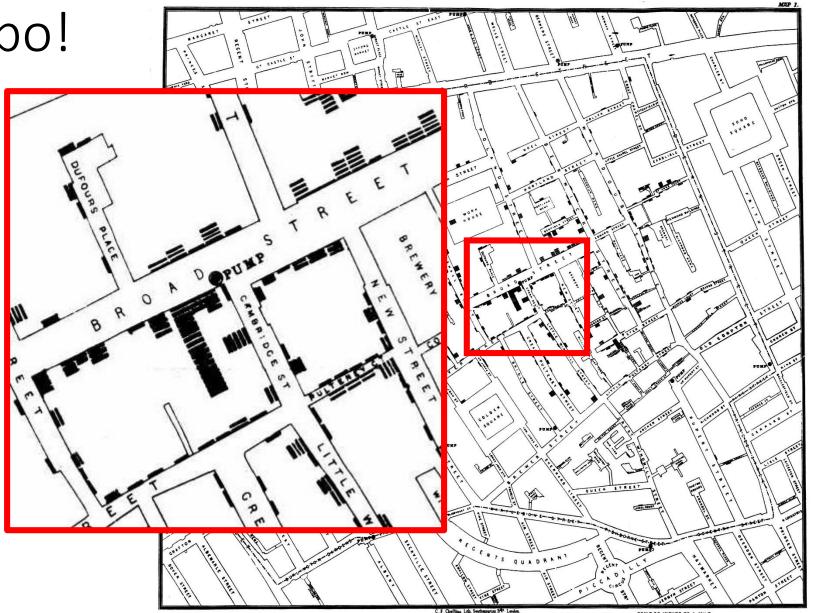
Charles Minard



Há Muito Tempo!



John Snow



Visualização de Dados

Ajudar pessoas a realizar tarefas de uma maneira mais efetiva

O uso de representações visuais de dados, suportadas por computadores, para

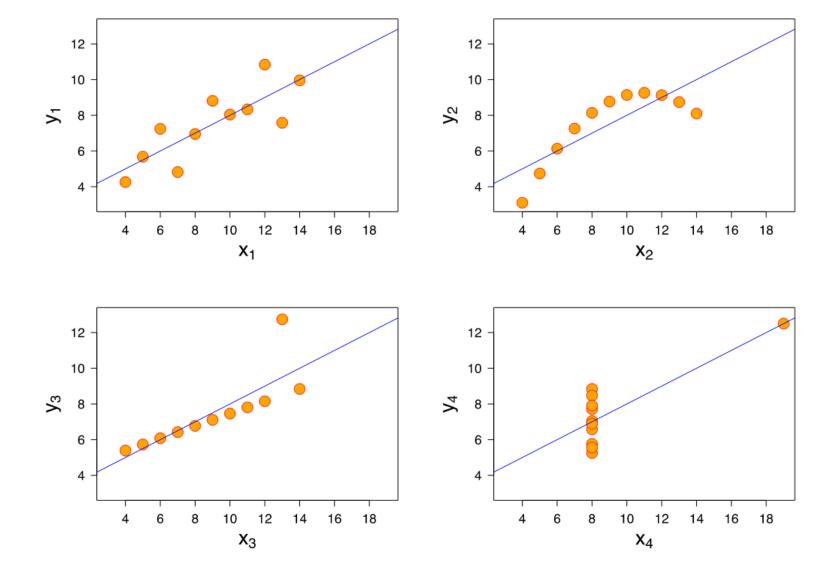
amplificar a cognição

Readings in Information Visualization: Using Vision to Think By Stuart K. Card, Jock D. Mackinlay, Ben Shneiderman

Quarteto de Anscomb

| | I | II | | | III | | IV | |
|------|-------|--|-------|------|------|------|-------|--|
| Х | У | Х | у | х | У | х | У | |
| 10.0 | 8.04 | 10.0 | Q 1/I | 10.0 | 7.46 | 8.0 | 6.58 | |
| 8.0 | 6.95 | Para cada conjunto de dados: Média(x) = 9 Média(y) = 7,5 Var(x) = 11 Var(y) = 4,12 Cor(x,y) = 0.816 Regressão Linear: y = 0.5x + 3 | | | | 3.0 | 5.76 | |
| 13.0 | 7.58 | | | | | 3.0 | 7.71 | |
| 9.0 | 8.81 | | | | | 3.0 | 8.84 | |
| 11.0 | 8.33 | | | | | 3.0 | 8.47 | |
| 14.0 | 9.96 | | | | | 3.0 | 7.04 | |
| 6.0 | 7.24 | | | | | 3.0 | 5.25 | |
| 4.0 | 4.26 | | | | | .9.0 | 12.50 | |
| 12.0 | 10.84 | 12.0 | 9.13 | 12.0 | 8.15 | 8.0 | 5.56 | |
| 7.0 | 4.82 | 7.0 | 7.26 | 7.0 | 6.42 | 8.0 | 7.91 | |
| 5.0 | 5.68 | 5.0 | 4.74 | 5.0 | 5.73 | 8.0 | 6.89 | |

Quarteto de Anscomb



Visualização de Dados

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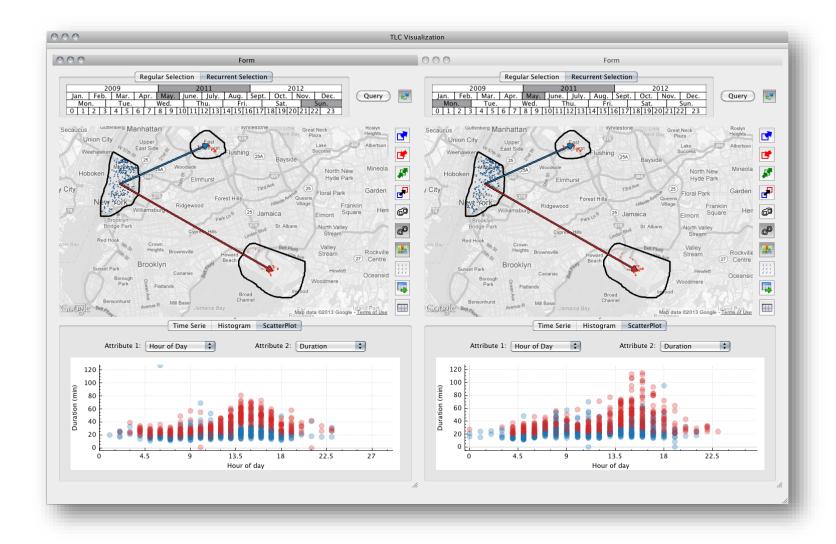
Data-Driven Documents



D3.js is a JavaScript library for manipulating documents based on data. **D3** helps you bring data to life using HTML, SVG, and CSS. D3's emphasis on web standards gives you the full capabilities of modern browsers without tying yourself to a proprietary framework, combining powerful visualization components and a data-driven approach to DOM manipulation.

See more examples.

• http://www.nytimes.com/interactive/2016/02/19/us/2015-year-in-weather-temperature-precipitation.html#abakan_russia



TaxiVis: Exploring Taxi Trip Records in New York City



Usos da Visualação de Dados

Insight

Comunicação

Insight

Exploração/Análise

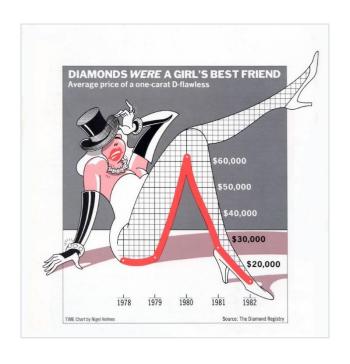
Insight

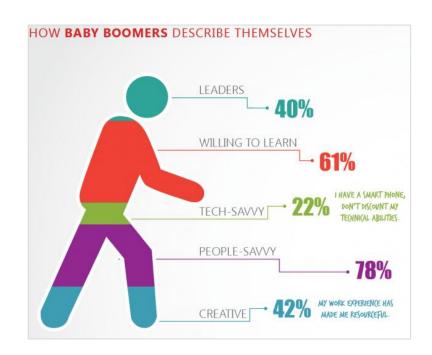
Usos da Visualação de Dados

Insight

Comunicação

Insight







Usos da Visualação de Dados

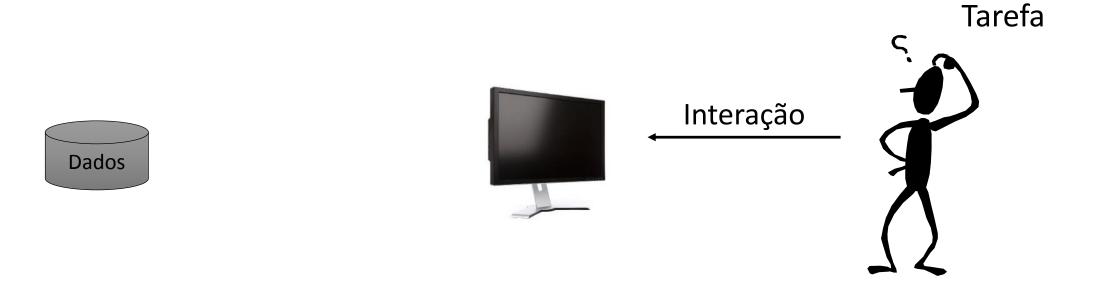
Data Exploração/Análise Insight

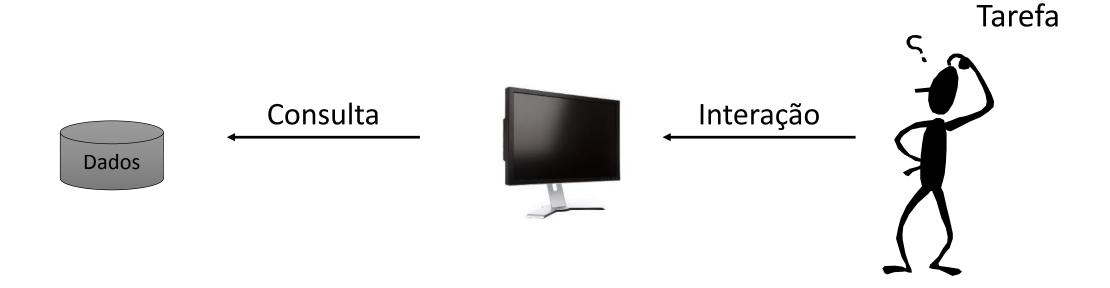


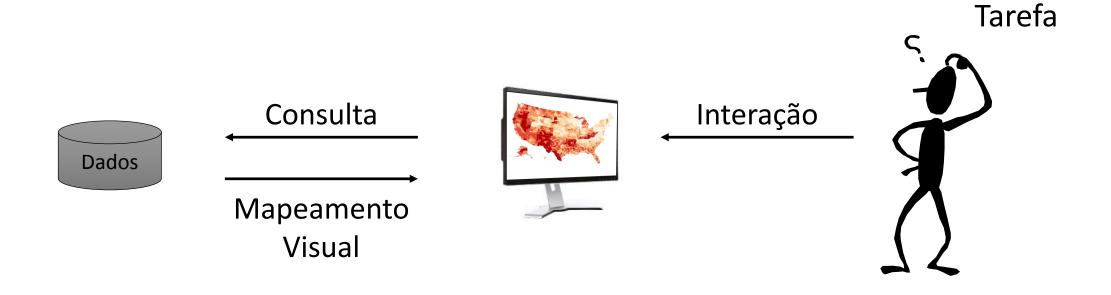


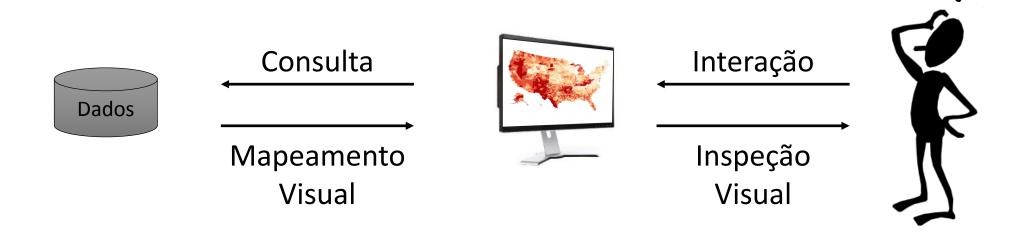


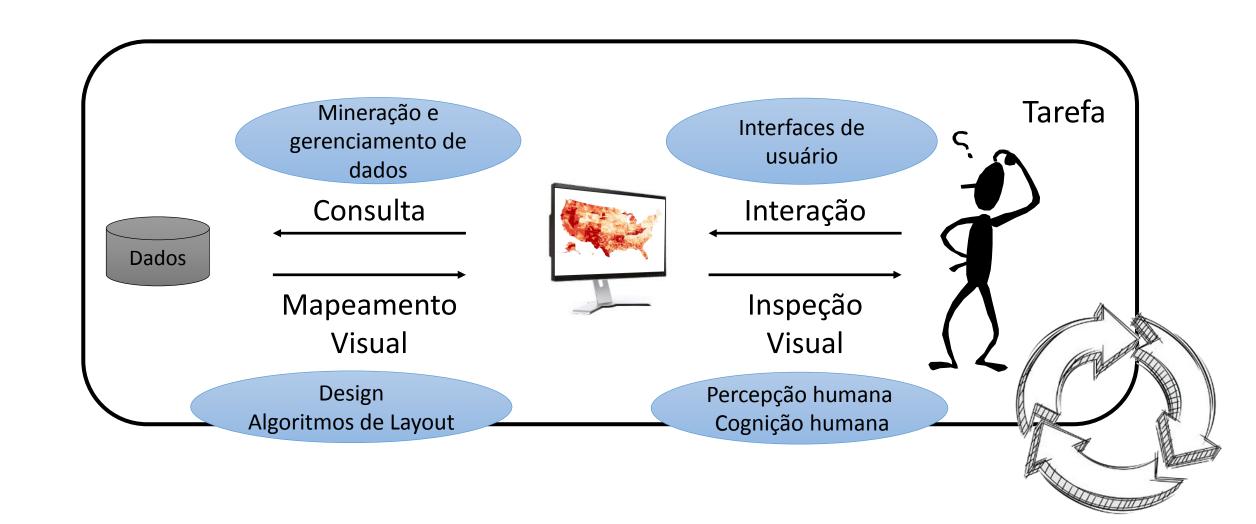




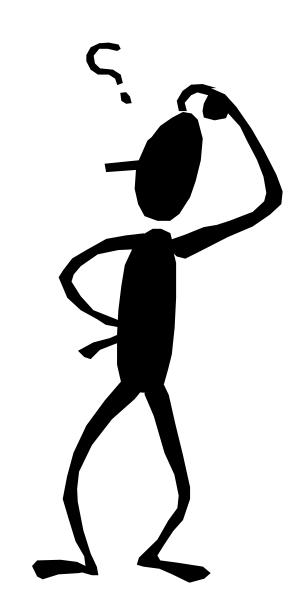


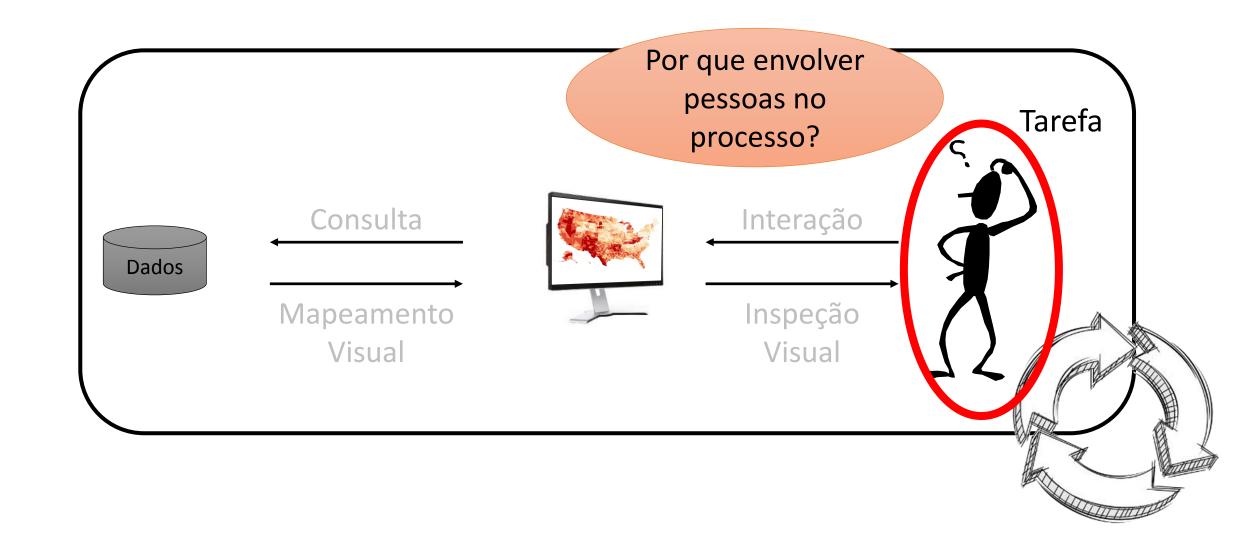


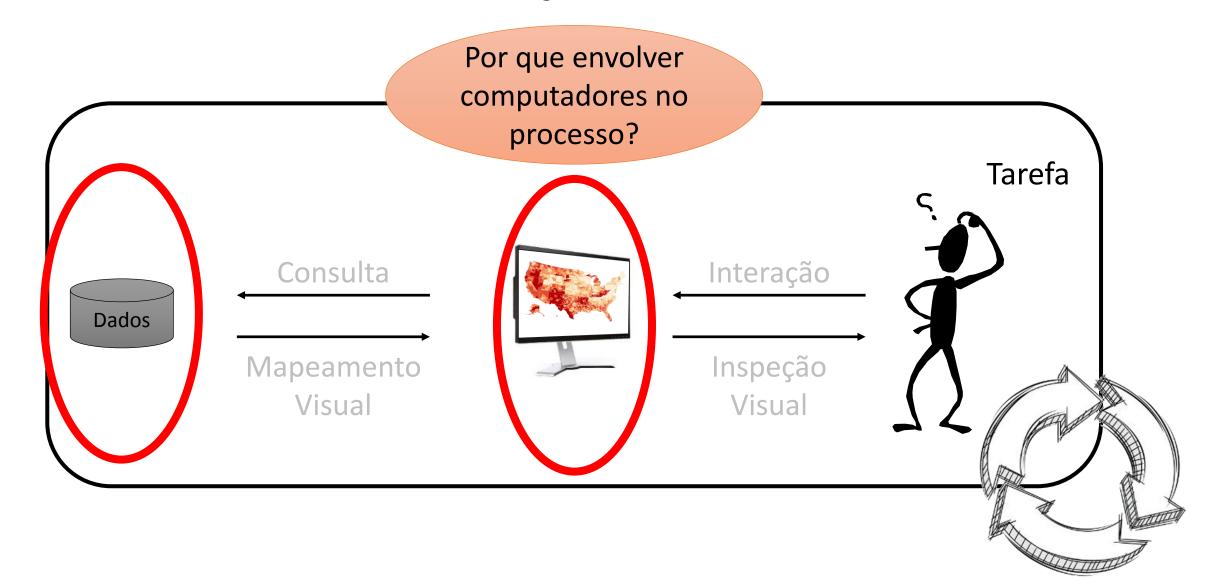


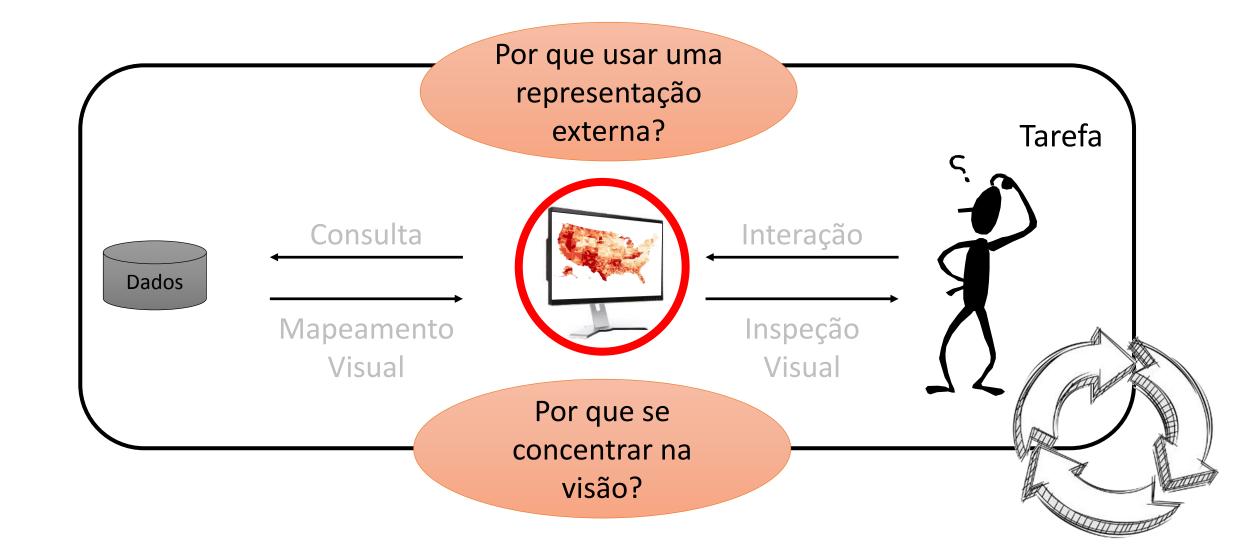


Mas.... por quê?

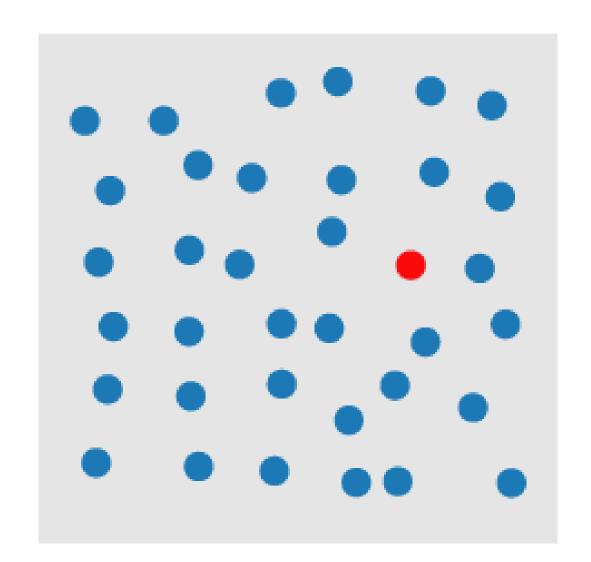




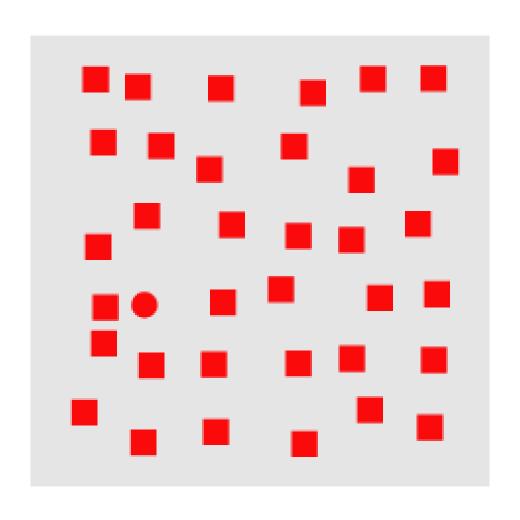




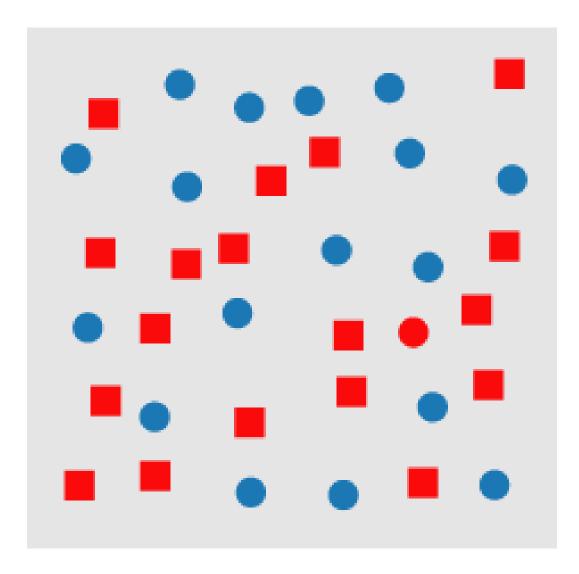
"Visual Pop-Out"

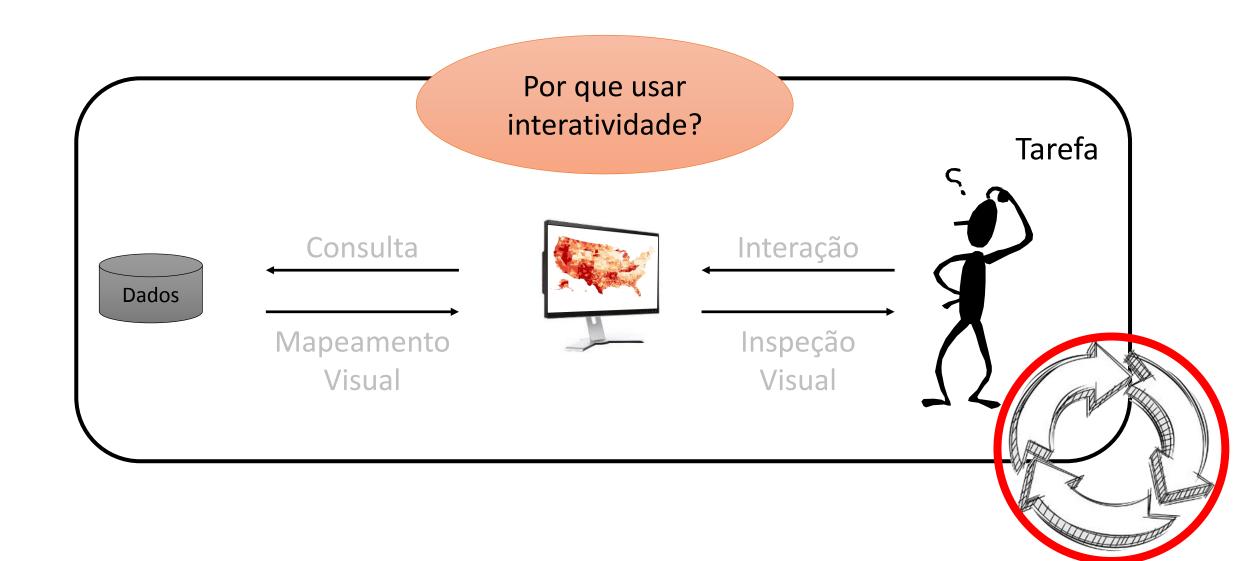


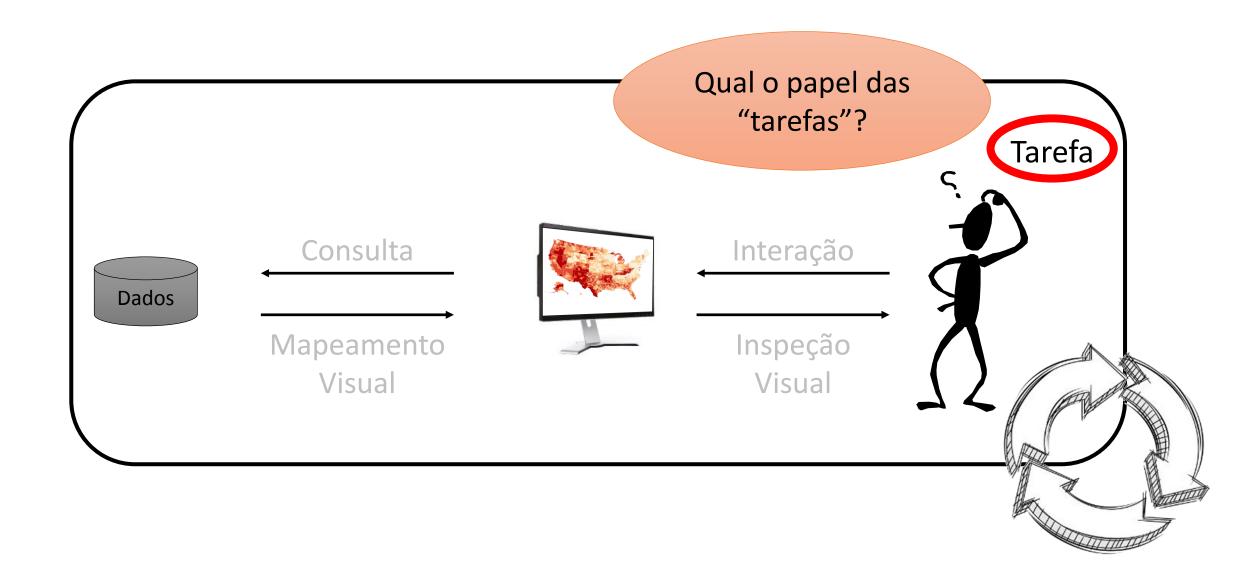
"Visual Pop-Out"

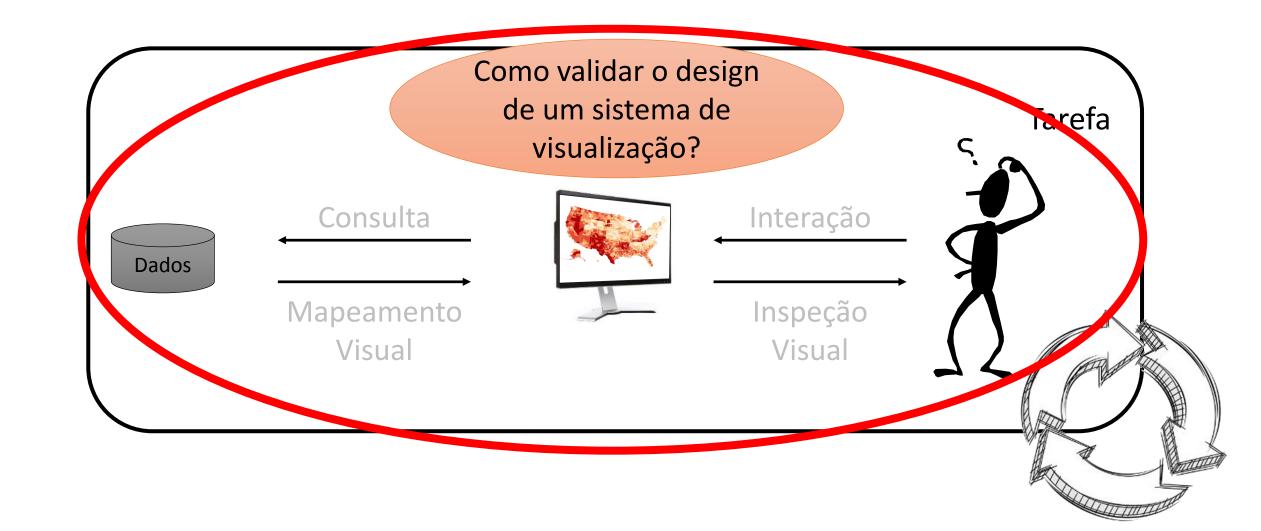


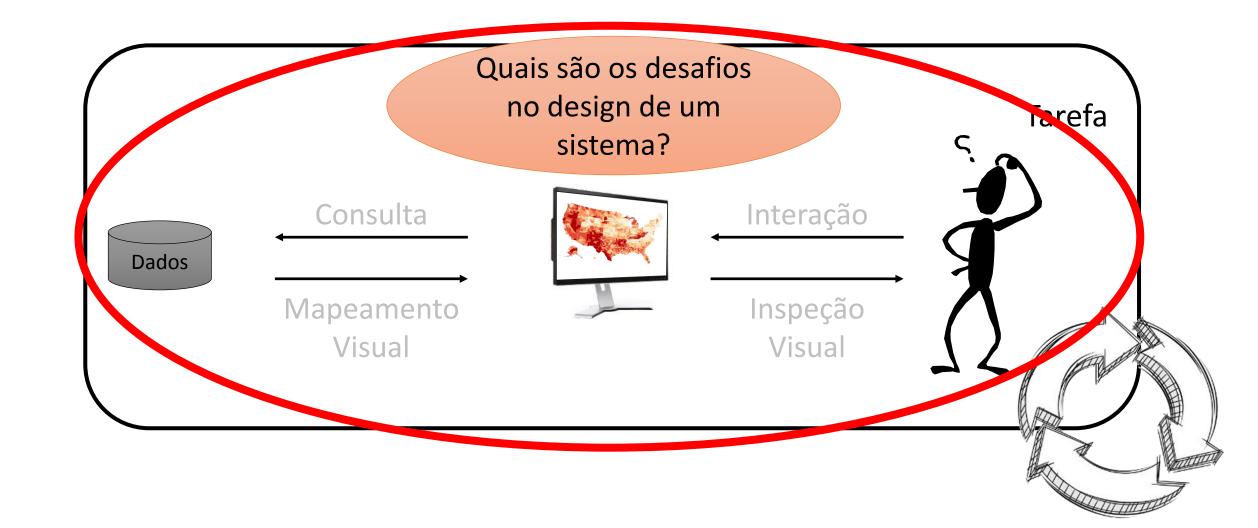
"Visual Pop-Out"











Resumo

- Visualização é uma ferramenta muito importante para a análise dos dados
- Existem muitos desafios na concepção de sistemas de visualização interativa de dados

Logística do Curso

Logística

- Website: www.cin.ufpe.br/~nivan/teaching/data-vis/fall-2016
- Atividades
 - Listas de Exercício
 - Projeto
- Aspectos Práticos
 - Princípios
 - Algoritmos/Matemática
 - Implementação (D3js)

Logística

- Website: www.cin.ufpe.br/~nivan/teaching/data-vis/fall-2016
- Avaliação
 - 40% Listas de Exercício
 - 50% Projeto
 - 10% Presença e Participação

