Data Visualization

An Introduction

Made Satria Wibawa, M.Eng.

Artwork: Tamar Cohen, Andrew J Buboltz, 2011, silk screen on a page from a high school yearbook, 8.5" x 12"

DATA

Data Scientist: The Sexiest Job of the 21st Century

by Thomas H. Davenport and D.J. Patil

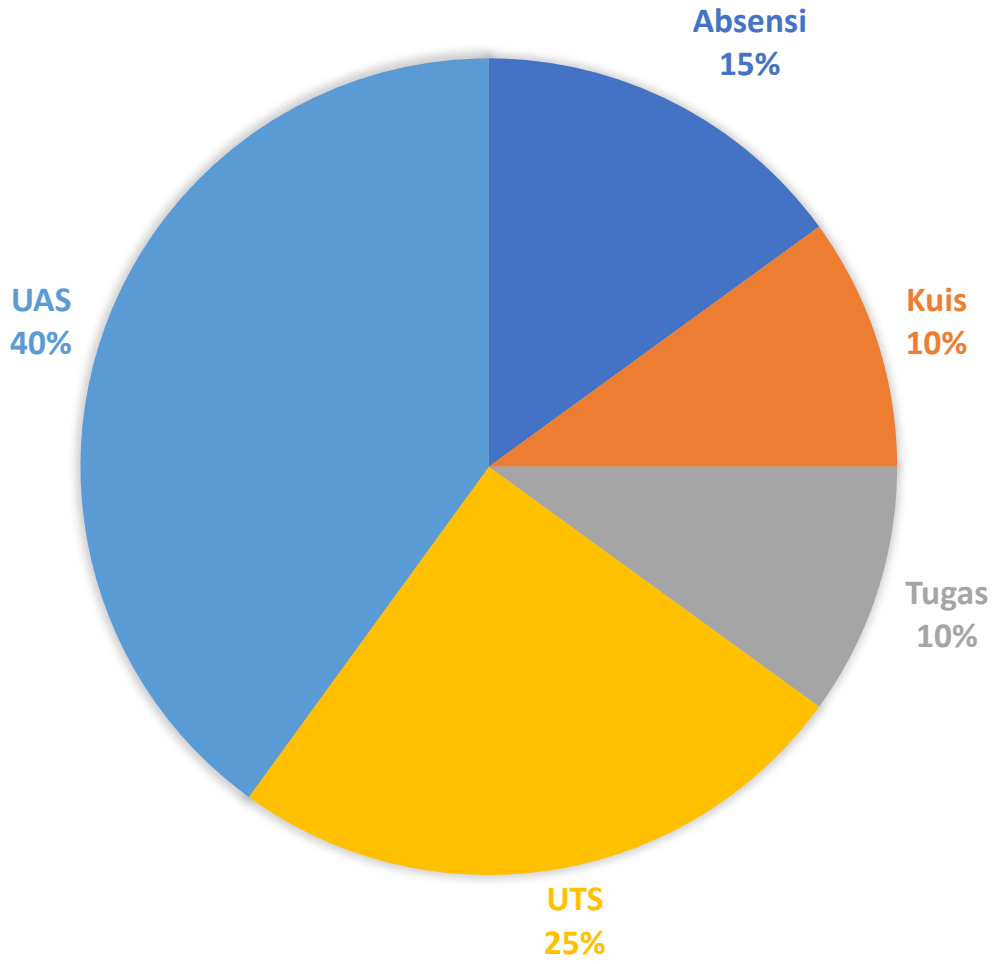
From the October 2012 Issue

When Jonathan Goldman arrived for work in June 2006 at LinkedIn, the business networking site, the place still felt like a start-up. The company had just under 8 million accounts, and the number was growing quickly as existing members invited their friends and colleagues to join. But users weren't seeking out connections with the people who were already on the site at the rate executives had expected. Something was apparently missing in the social experience. As one LinkedIn manager put it, "It was like arriving at a conference reception and realizing you don't know anyone. So you just stand in the corner sipping your drink—and you probably leave early."

Goldman, a PhD in physics from Stanford, was intrigued by the linking he did see going on and by the richness of the user profiles. It all made for messy data and unwieldy analysis, but as he began exploring people's connections, he started to see possibilities. He began forming theories, testing hunches, and finding patterns that allowed him to predict whose networks a given profile would land in. He could imagine that new features capitalizing on the heuristics he was developing might provide value to users. But LinkedIn's engineering team, caught up in the challenges of scaling up the site, seemed uninterested. Some colleagues were openly dismissive of Goldman's ideas. Why would users need LinkedIn to figure out their networks for them? The site already had an address book importer that could pull in all a member's connections

https://hbr.org/2012/10/data-scientist-the-sexiest-job-of-the-21st-century

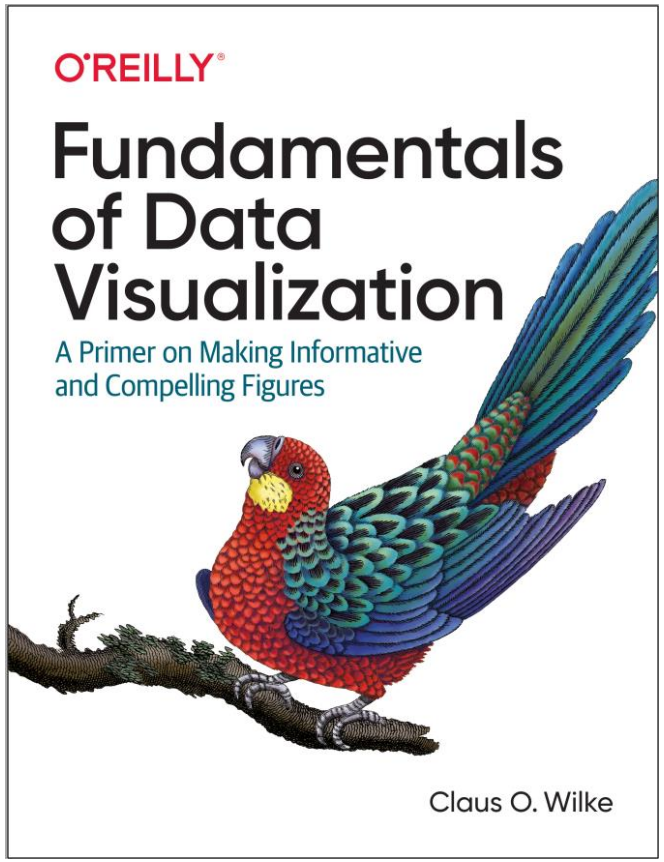
KOMPOSISI NILAI



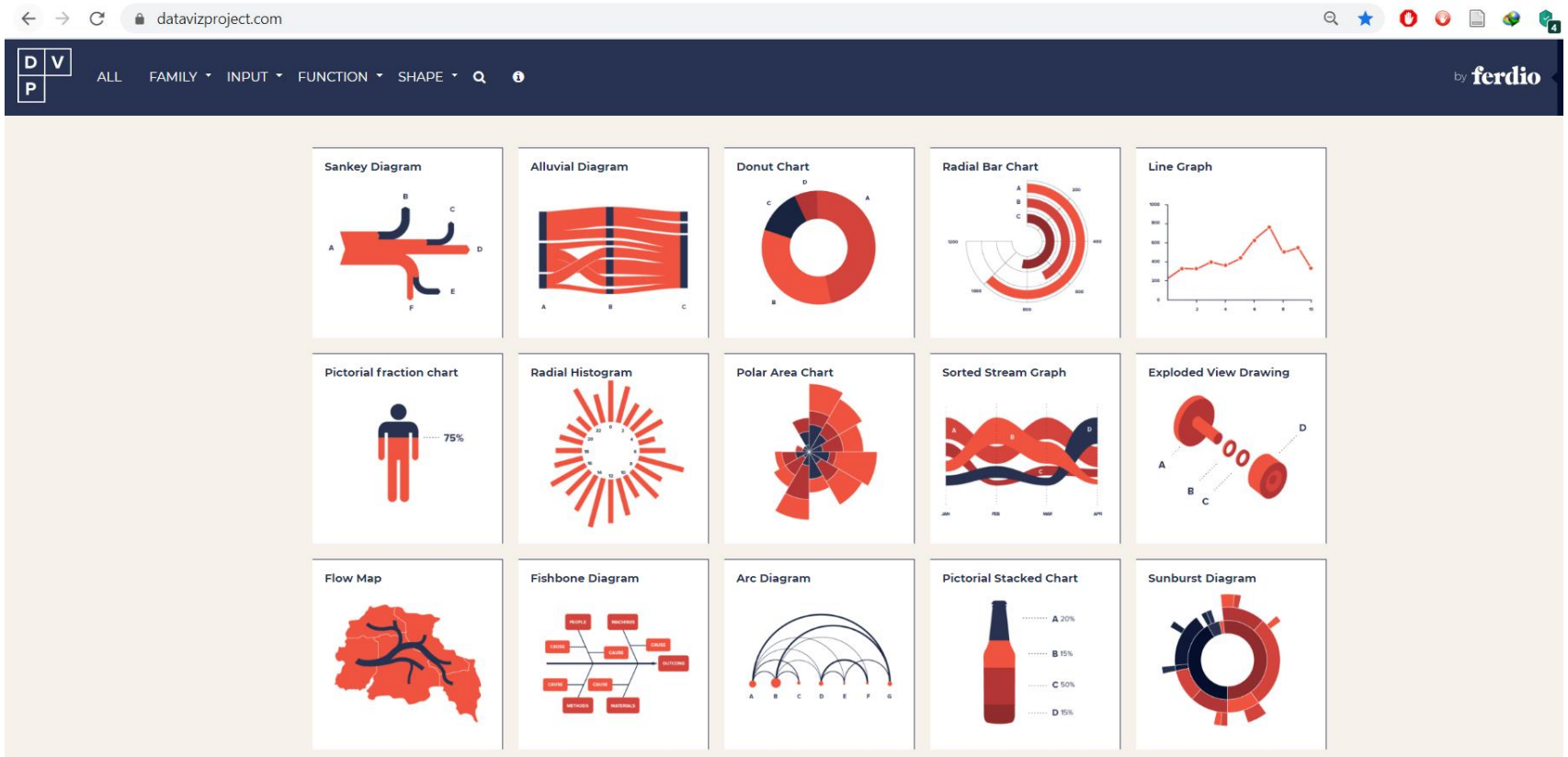
- Kuis *take home* minimal 1 kali
- Tugas *take home* minimal 2 kali
- UTS teori
- UAS Project minimal 2 kali

Tidak ada toleransi keterlambatan pengumpulan project, kuis dan tugas

REFERENSI



Referensi Buku:



Beberapa Contoh Visualisasi

1. https://serialmentor.com/dataviz/
2. https://trinachi.github.io/data-design-builds/copyright-page01.html

MATERI

- Teori
  - dasar statistik
  - teori visualisasi
  - teori diagram
- Praktek
  - pengolahan data
  - visualisasi digital

PYTHON

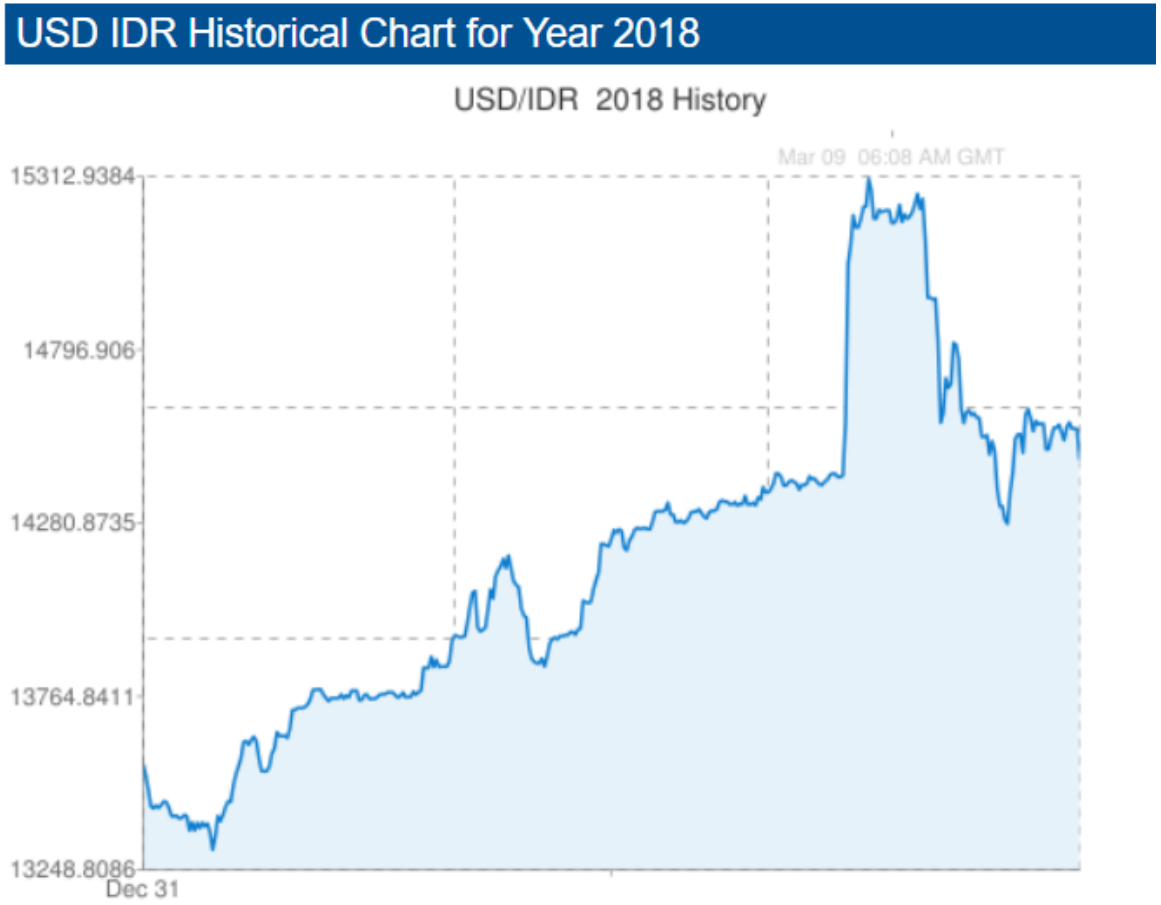
- Free !
- Banyak library untuk semua proses data preprocessing, data mining, data visualization (*numpy, pandas, matplotlib, seaborn, bokeh, sklearn*)
- Dokumentasi dan komunitas yang baik

Silahkan instalasi mandiri python beserta library yang dibutuhkan.

Panduan instalasi dapat dilihat di e-learning.

LATAR BELAKANG

Date	US Dollar to Indonesian Rupiah Monthly Exchange Rates	
Monday 1 January 2018	$1 USD = Rp13563.0645	US Dollar Indonesian Rupiah rate for 01/01/2018
Tuesday 2 January 2018	$1 USD = Rp13529.9757	US Dollar Indonesian Rupiah rate for 02/01/2018
Wednesday 3 January 2018	$1 USD = Rp13485.8748	US Dollar Indonesian Rupiah rate for 03/01/2018
Thursday 4 January 2018	$1 USD = Rp13437.5489	US Dollar Indonesian Rupiah rate for 04/01/2018
Friday 5 January 2018	$1 USD = Rp13431.9216	US Dollar Indonesian Rupiah rate for 05/01/2018
Saturday 6 January 2018	$1 USD = Rp13440.154	US Dollar Indonesian Rupiah rate for 06/01/2018
Sunday 7 January 2018	$1 USD = Rp13432.9825	US Dollar Indonesian Rupiah rate for 07/01/2018
Monday 8 January 2018	$1 USD = Rp13441.3312	US Dollar Indonesian Rupiah rate for 08/01/2018
Tuesday 9 January 2018	$1 USD = Rp13452.2675	US Dollar Indonesian Rupiah rate for 09/01/2018
Wednesday 10 January 2018	$1 USD = Rp13450.2814	US Dollar Indonesian Rupiah rate for 10/01/2018
Thursday 11 January 2018	$1 USD = Rp13432.6404	US Dollar Indonesian Rupiah rate for 11/01/2018
Friday 12 January 2018	$1 USD = Rp13408.4601	US Dollar Indonesian Rupiah rate for 12/01/2018
Saturday 13 January 2018	$1 USD = Rp13408.184	US Dollar Indonesian Rupiah rate for 13/01/2018
Sunday 14 January 2018	$1 USD = Rp13409.1819	US Dollar Indonesian Rupiah rate for 14/01/2018
Monday 15 January 2018	$1 USD = Rp13401.426	US Dollar Indonesian Rupiah rate for 15/01/2018
Tuesday 16 January 2018	$1 USD = Rp13403.2018	US Dollar Indonesian Rupiah rate for 16/01/2018
Wednesday 17 January 2018	$1 USD = Rp13411.9153	US Dollar Indonesian Rupiah rate for 17/01/2018
Thursday 18 January 2018	$1 USD = Rp13407.2371	US Dollar Indonesian Rupiah rate for 18/01/2018
Friday 19 January 2018	$1 USD = Rp13364.9782	US Dollar Indonesian Rupiah rate for 19/01/2018
Saturday 20 January 2018	$1 USD = Rp13389.7106	US Dollar Indonesian Rupiah rate for 20/01/2018
Sunday 21 January 2018	$1 USD = Rp13365.6302	US Dollar Indonesian Rupiah rate for 21/01/2018
Monday 22 January 2018	$1 USD = Rp13388.2031	US Dollar Indonesian Rupiah rate for 22/01/2018
Tuesday 23 January 2018	$1 USD = Rp13372.5751	US Dollar Indonesian Rupiah rate for 23/01/2018
Wednesday 24 January 2018	$1 USD = Rp13388.9094	US Dollar Indonesian Rupiah rate for 24/01/2018
Thursday 25 January 2018	$1 USD = Rp13377.569	US Dollar Indonesian Rupiah rate for 25/01/2018
Friday 26 January 2018	$1 USD = Rp13386.3147	US Dollar Indonesian Rupiah rate for 26/01/2018
Saturday 27 January 2018	$1 USD = Rp13359.4164	US Dollar Indonesian Rupiah rate for 27/01/2018
Sunday 28 January 2018	$1 USD = Rp13308.6977	US Dollar Indonesian Rupiah rate for 28/01/2018
Monday 29 January 2018	$1 USD = Rp13347.3911	US Dollar Indonesian Rupiah rate for 29/01/2018
Tuesday 30 January 2018	$1 USD = Rp13408.4795	US Dollar Indonesian Rupiah rate for 30/01/2018
Wednesday 31 January 2018	$1 USD = Rp13393.2869	US Dollar Indonesian Rupiah rate for 31/01/2018



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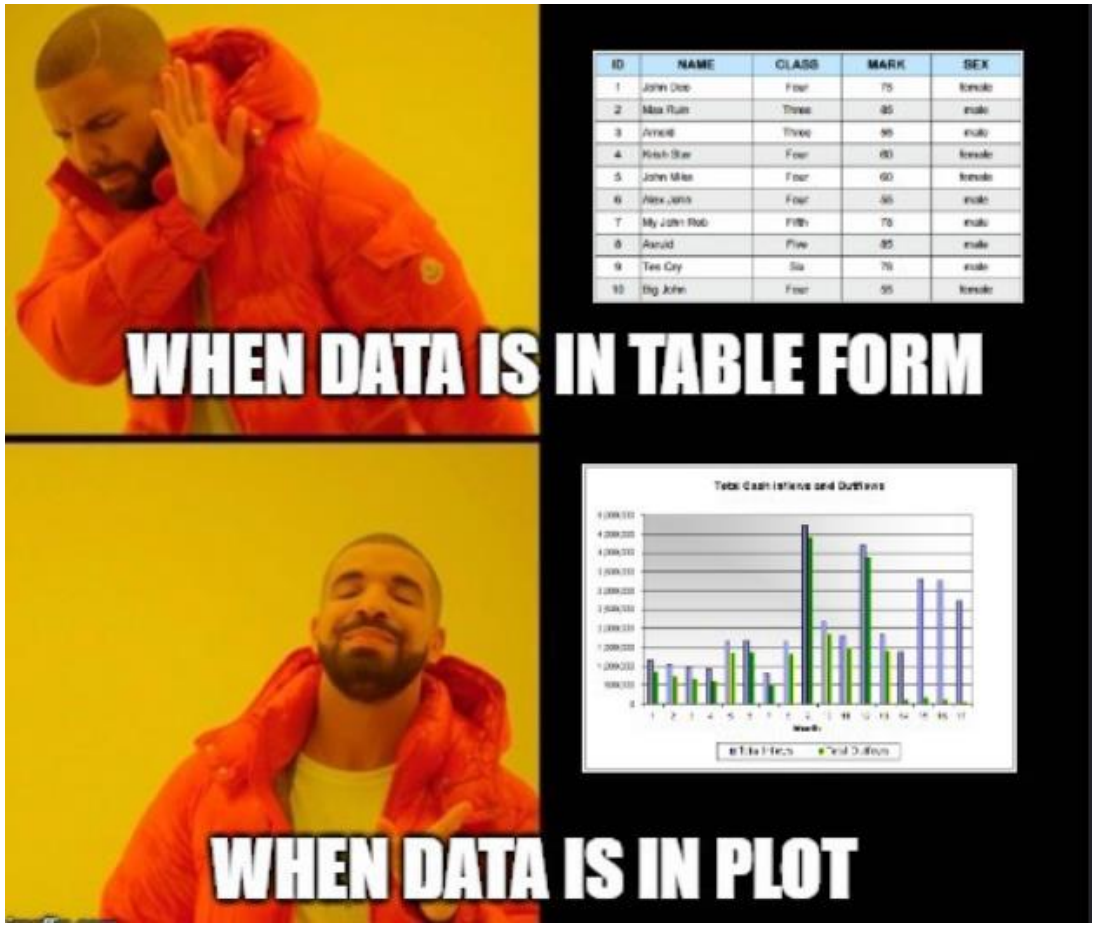


Visualisasi adalah cara ‘berkomunikasi’ yang efektif dan efisien

Definisi :

Data visualization (visualisasi data) adalah proses **konversi data mentah** ke informasi dalam bentuk **gambar yang mudah dimengerti** untuk memudahkan **pengambilan keputusan** yang **cepat dan efektif**.

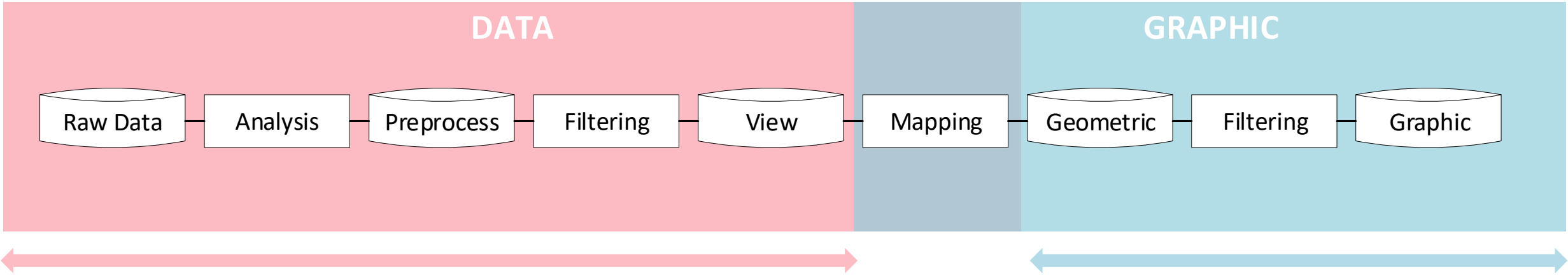
KOMPONEN DATA VISUALIZATION

- **Data.** Data apa yang tersedia, apa maknanya? Bagaimana bentuk data? Apa aspek penting dalam data? Darimana asal data?
- **Task**. Apa yang harus diolah dari data? Apa pertanyaan tentang data yang dapat digunakan untuk mendukung tujuan visualisasi?
- **Stakeholders.** Siapa yang terlibat dalam data, permasalahan dan tujuannya? Siapa yang akan melihat visualisasi final? Apa yang diharapkan dari visualisasi data?
- **Visualization.** Bagaimana cara membuat visualisasi supaya data dapat dipahami? Apa representasi dari data yang diharapkan untuk memenuhi task?

MANFAAT

- Memungkinkan kita untuk melihat perspektif yang berbeda dari data
- Memungkinkan kita untuk menginterpretasi jumlah data yang sangat banyak
- Memungkinkan kita untuk melihat data yang unik
- Memungkinkan kita untuk menganalisa pola visual dalam data
- Membantu menerjemahkan pola data menjadi wawasan, menjadikannya tool untuk membuat keputusan yang efektif

PROSES VISUALISASI DATA

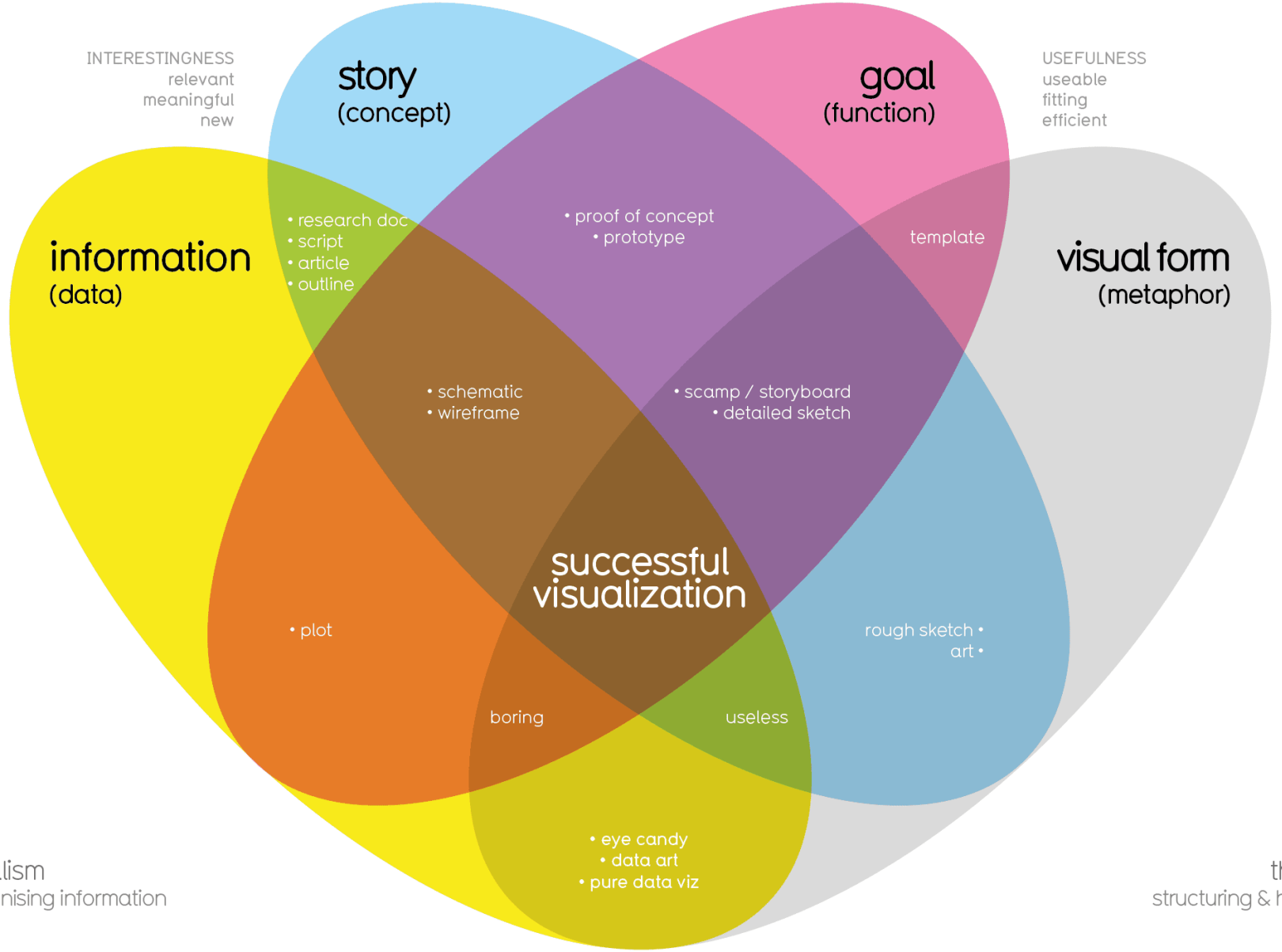


- tipe atribut
- statistik
- analisis outlier
- missing value
- feature reduction
- dsb

- teori warna
- sistem koordinat
- grafik untuk trend
- grafik untuk komparasi
- grafik untuk distribusi
- dsb

What Makes a Good Visualization?

explicit (implicit)



information
the art of journalism
structuring & harmonising information

visualization
the art of design
structuring & harmonising visuals

David McCandless
InformationisBeautiful.net

taken from new book
Knowledge is Beautiful

find out more
bit.ly/KIB_Books

Q & A