



C°F

DESIGNING WITH AND FOR DATA

USER INTERFACE DESIGN SEMINAR / 01-04-2015

*...and what
did we learn!*

ABOUT US

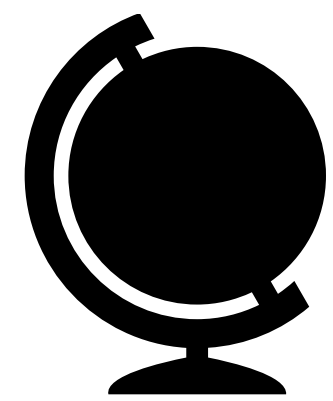
C°F

| 2008

 15

ABOUT US

C°F



Utrecht,
the Netherlands

CURRENT CLIENTS

C°F

PHILIPS

Google

ELSEVIER



The New York Times

WIRED



umcg

AIRFRANCE KLM

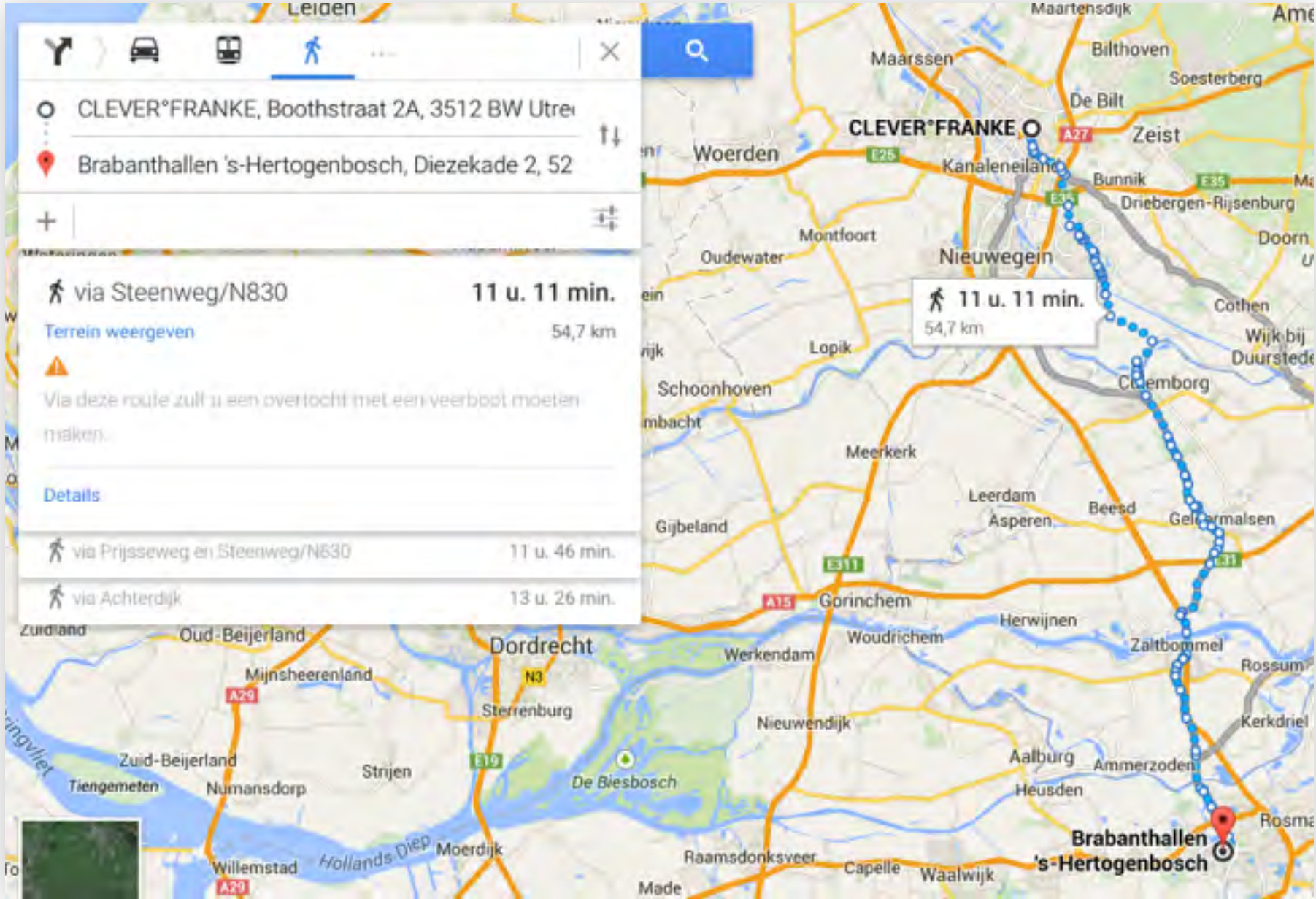
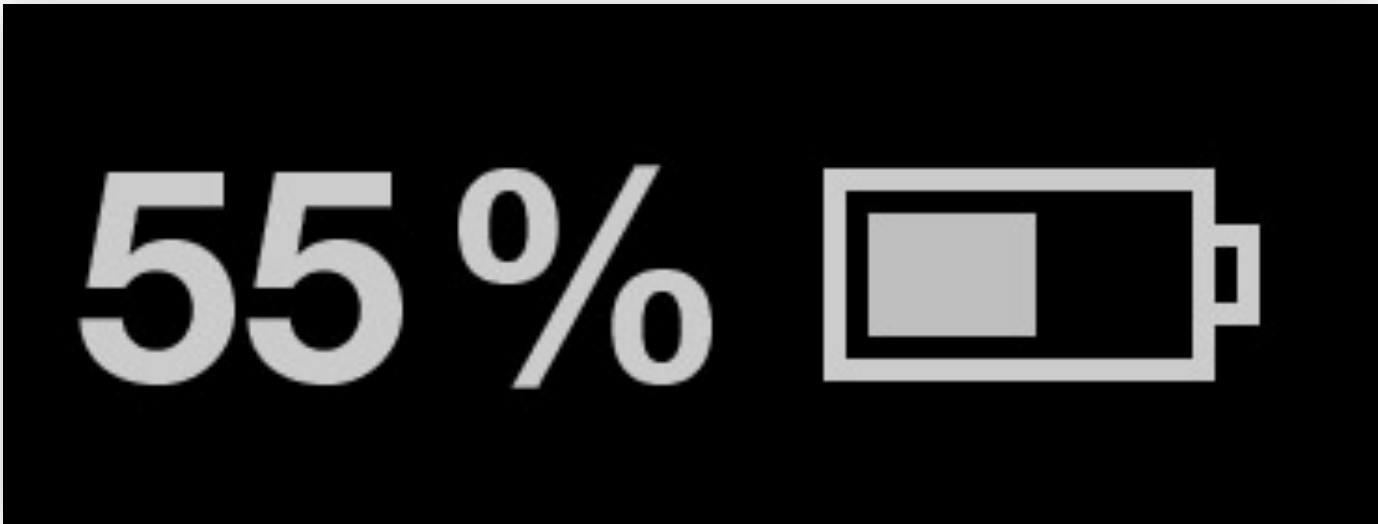
C°F

THE RISE OF DATA VISUALIZATION



DAILY LIFE

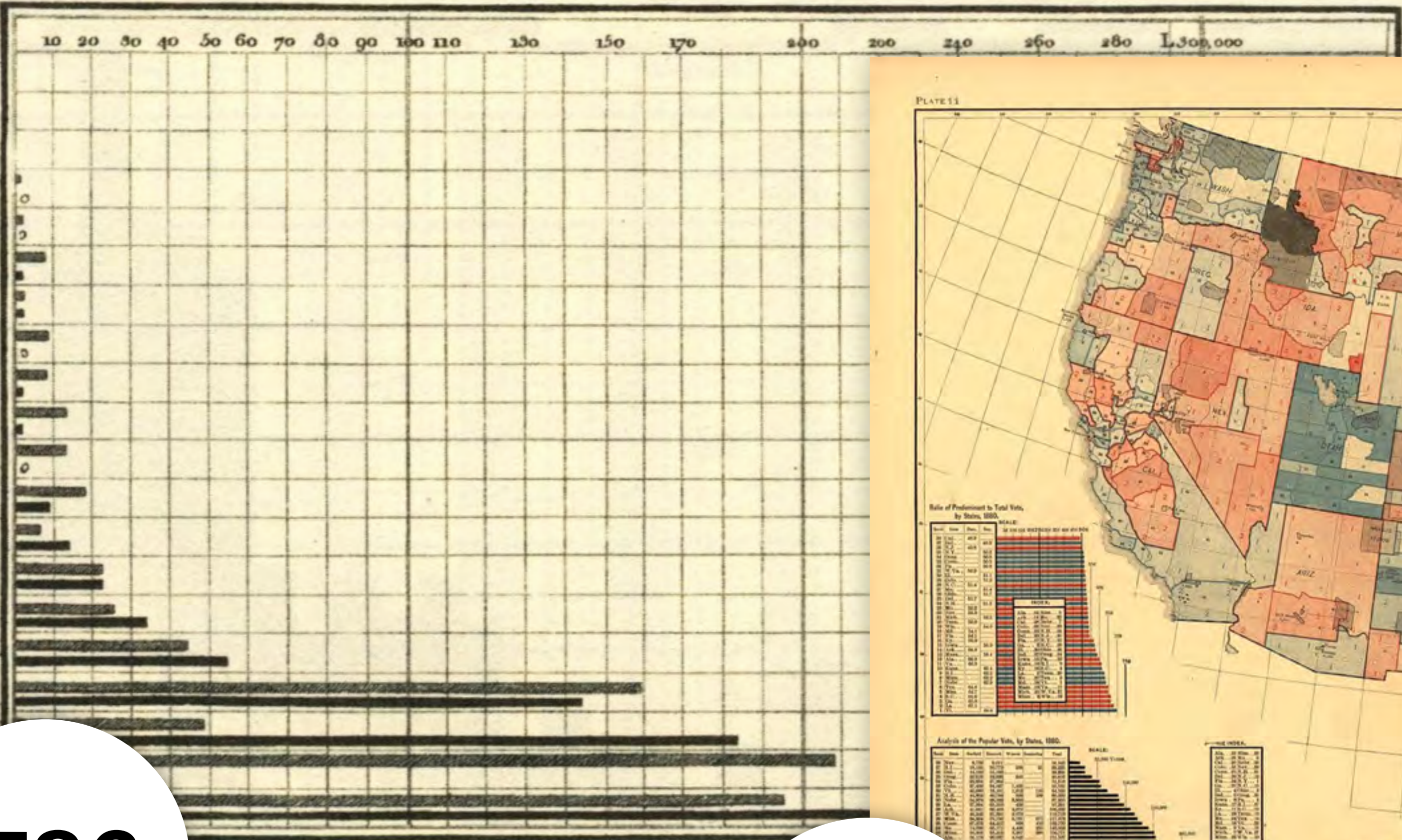
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HISTORY

C°F

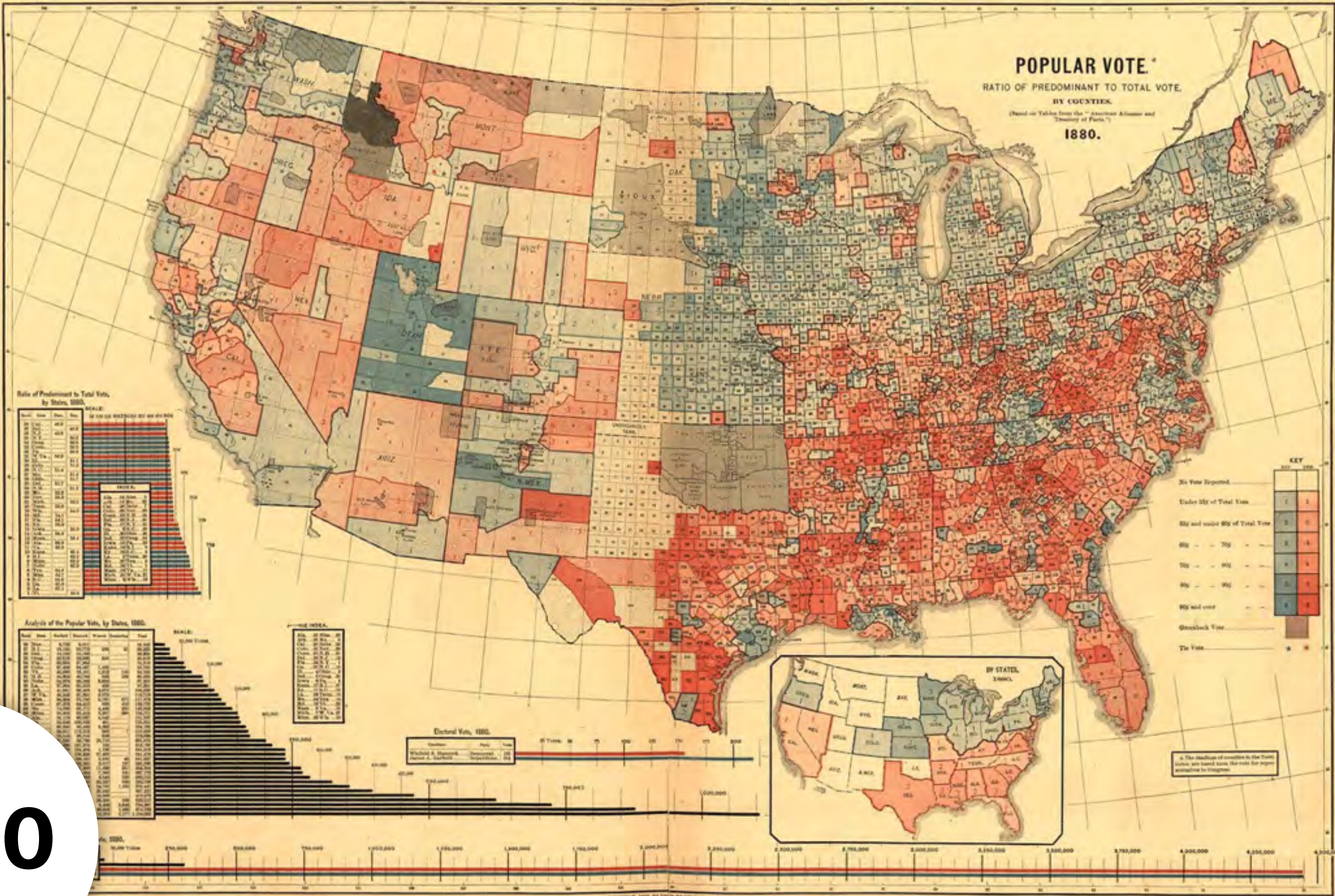
Exports and Imports of SCOTLAND to and from different parts for one Year from Christmas 1780 to Christmas 1781.



Each division is Ten Thousand Pounds each. The
June 7th 1781 by W^m Playfair

1786

POLITICAL HISTORY



1880

INTERNET + SENSORS

SENSORS ARE EVERYWHERE

C°F



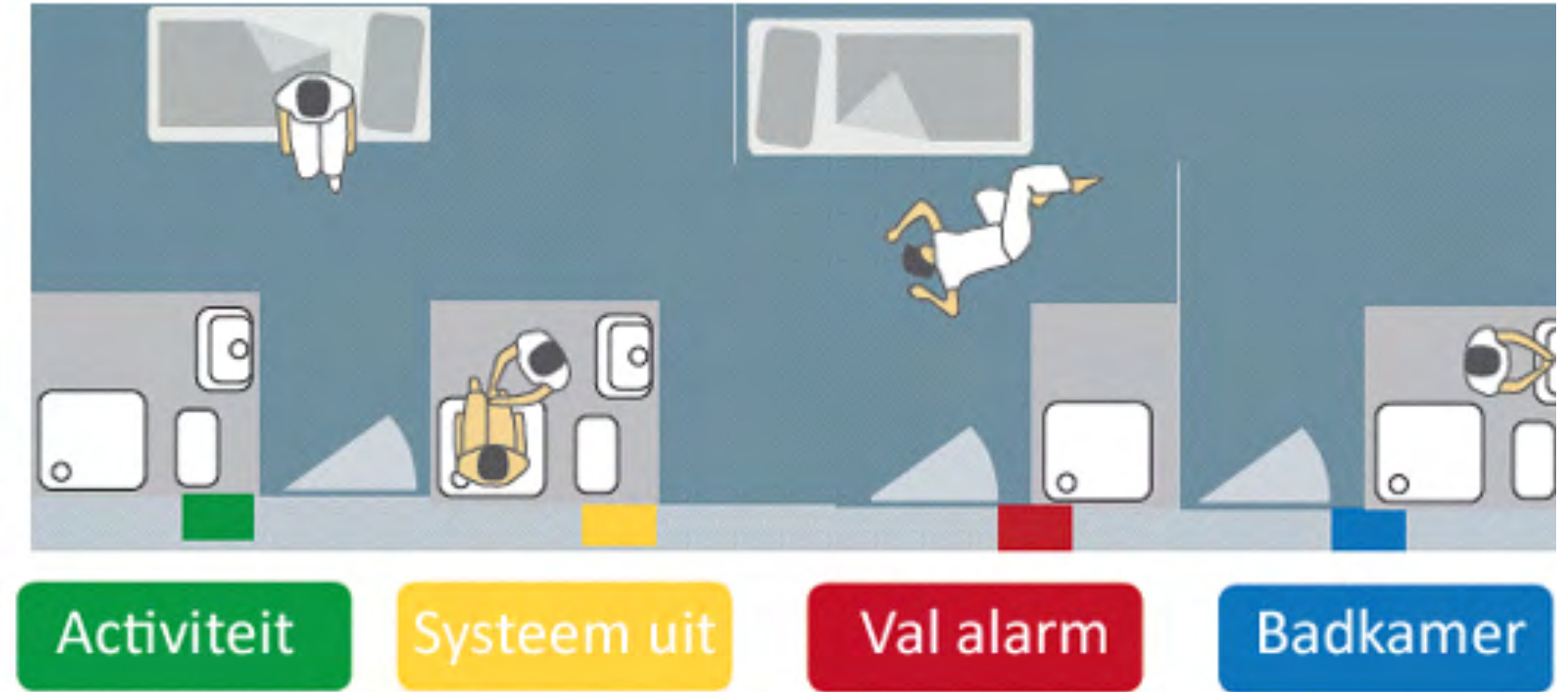
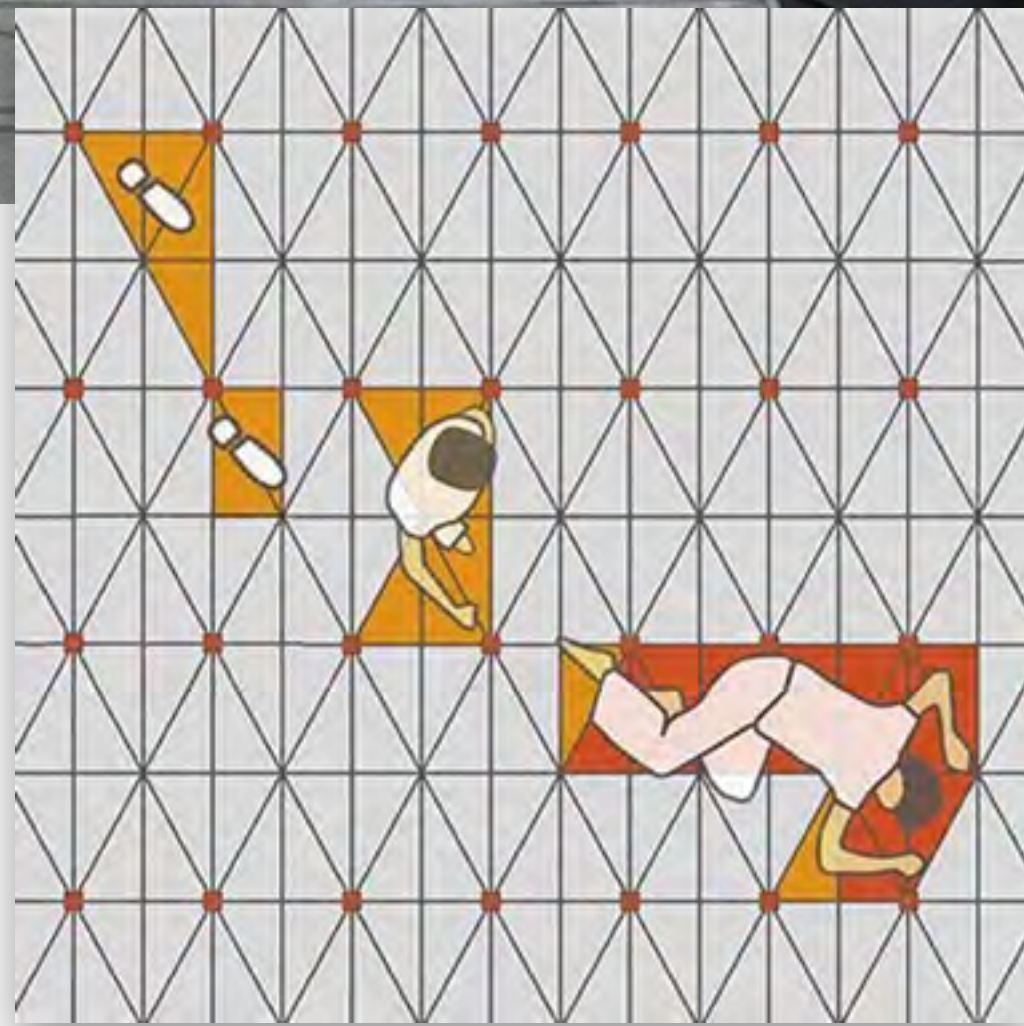
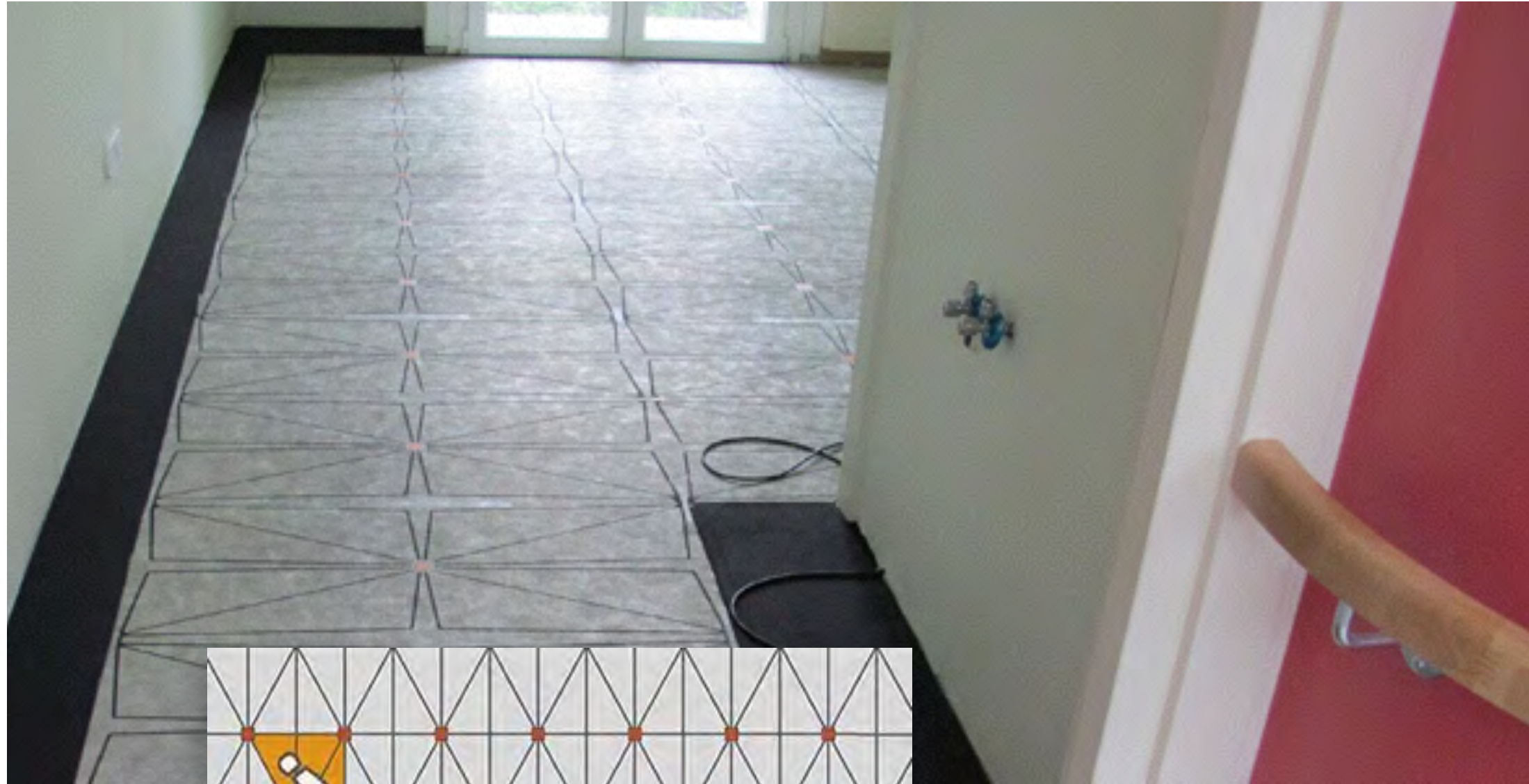
SENSORS ARE EVERYWHERE

C°F



SENSORS ARE EVERYWHERE

C°F

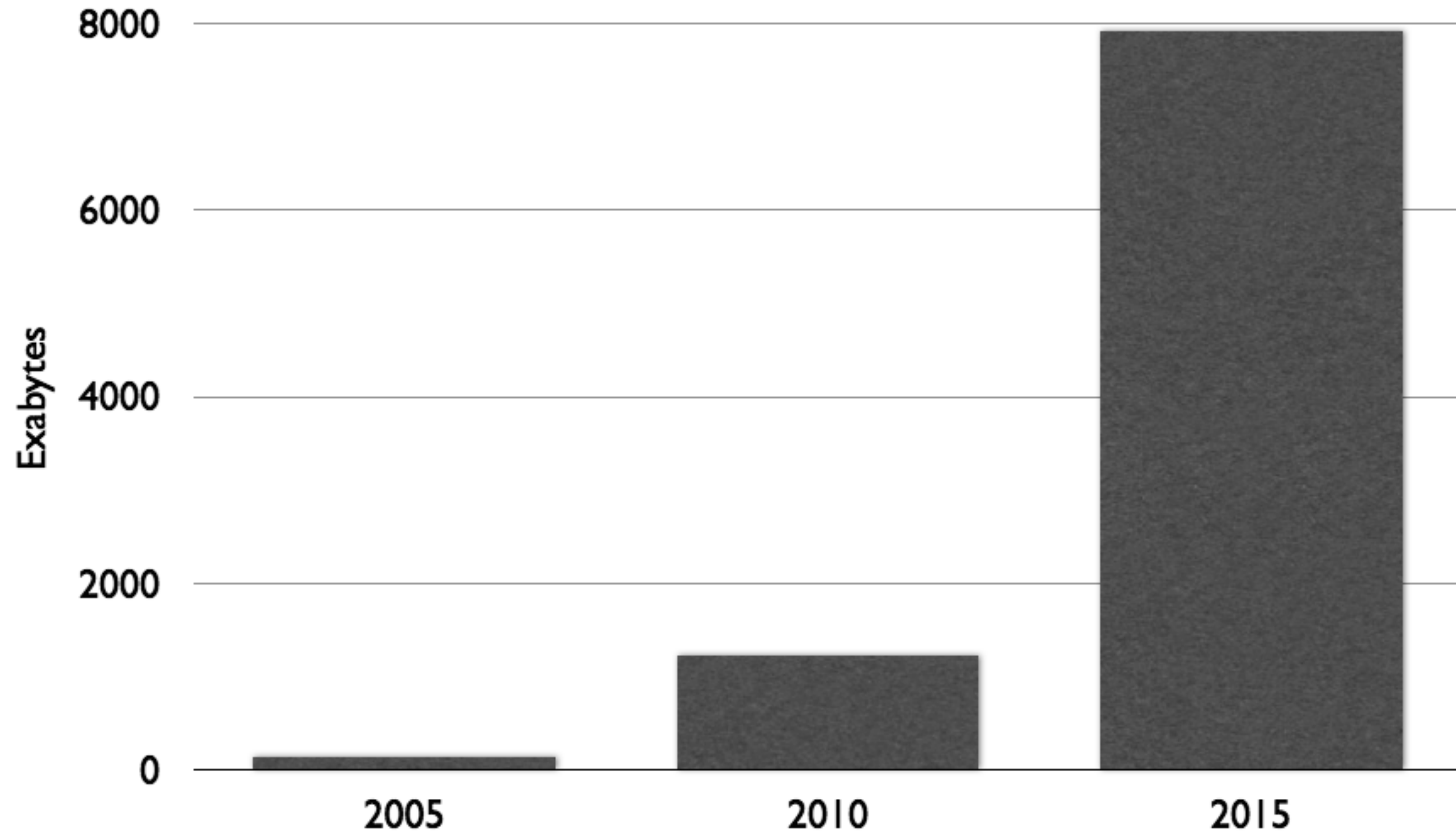


CF

GENERATES DATA

WORLDWIDE DATA GROWTH

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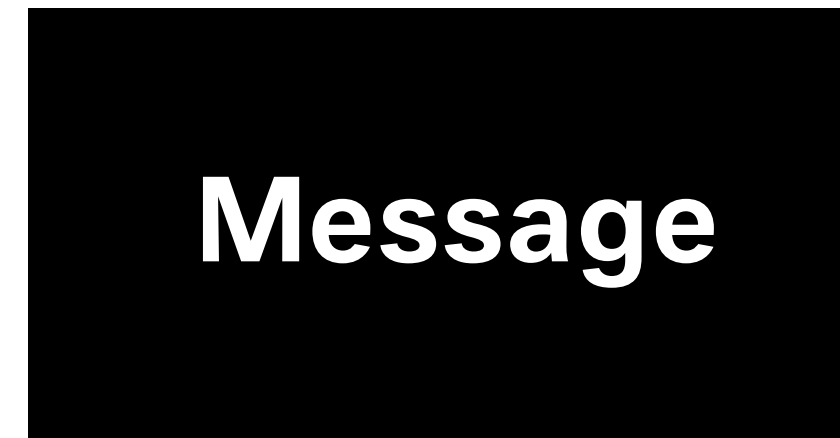
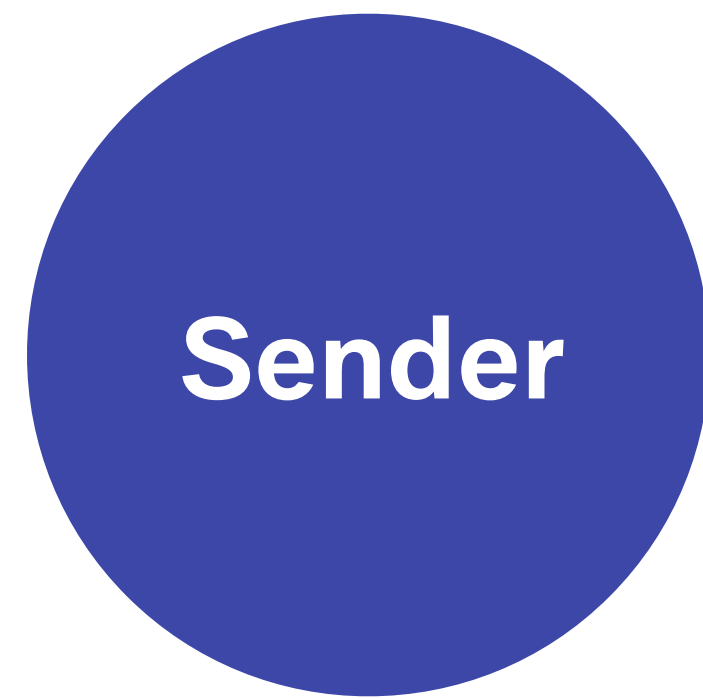
Source: IDC, EMC

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VISUALIZING DATA

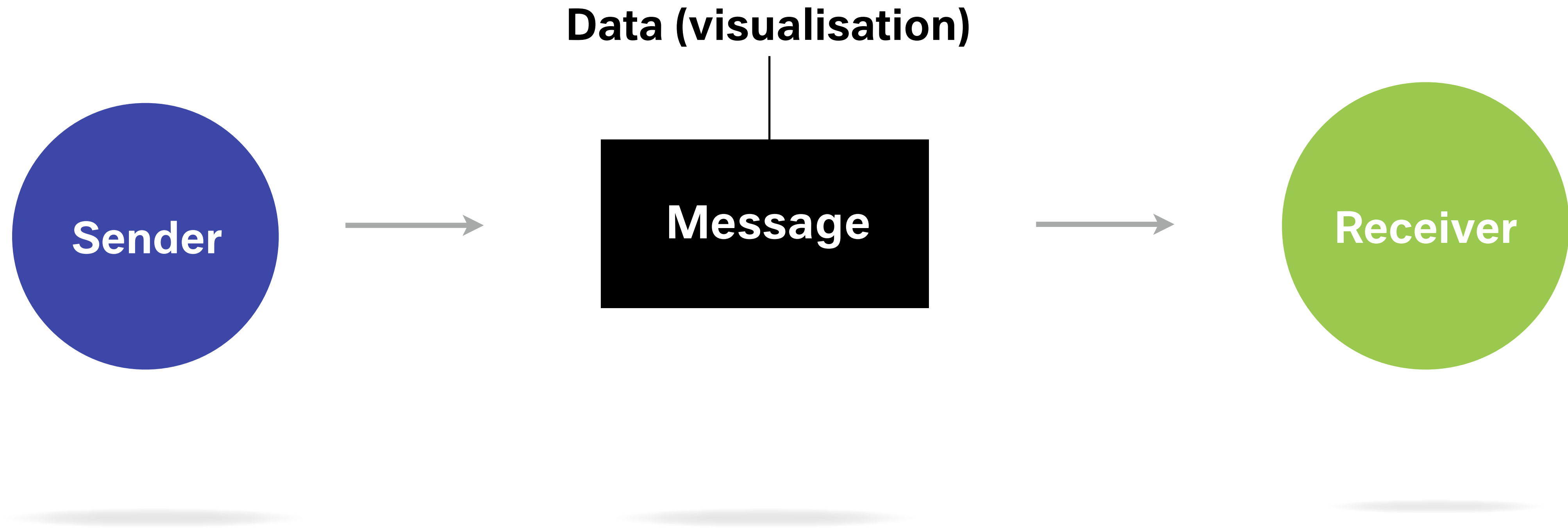
COMMUNICATION

C°F



COMMUNICATION

C°F



INPUT DATA

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For example:

- Numerical data

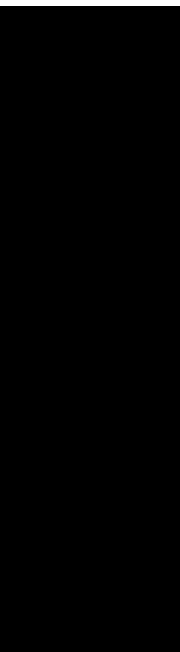
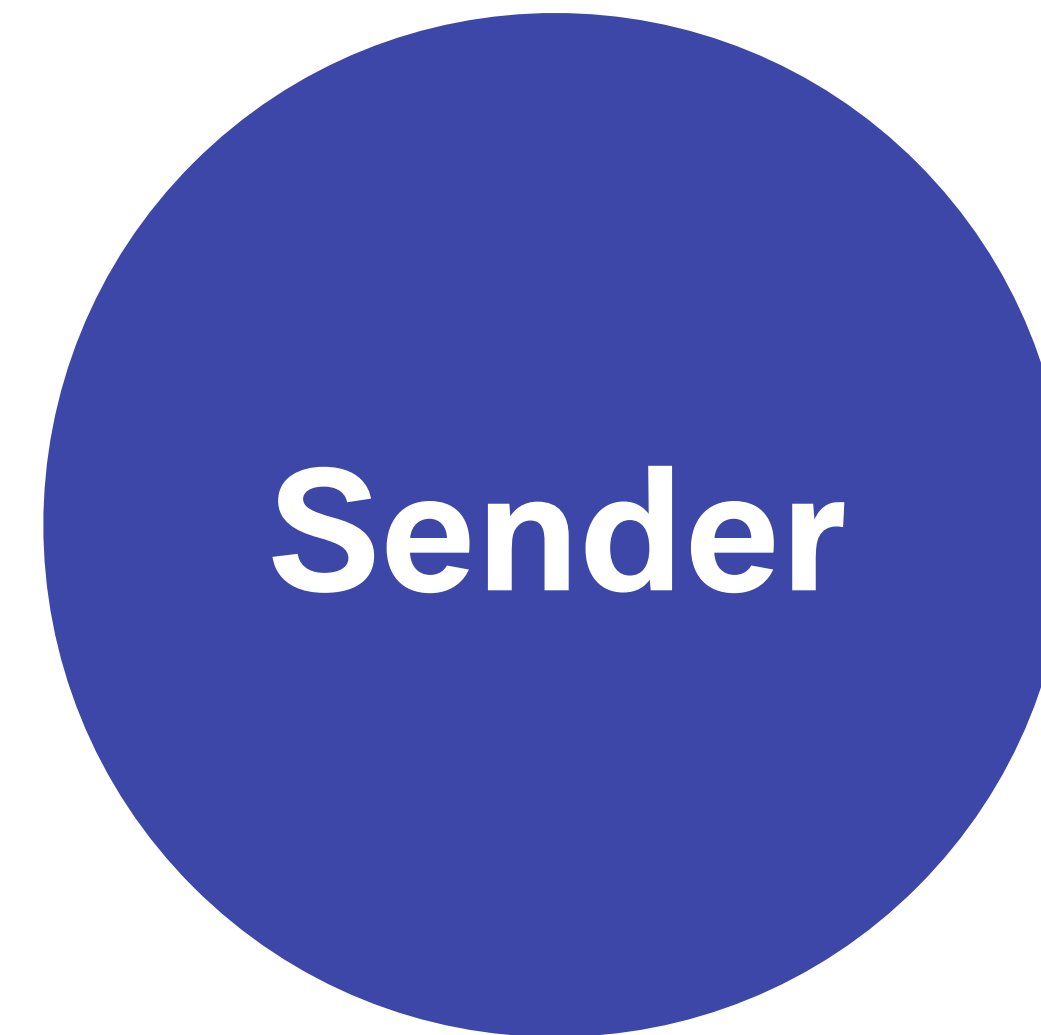
- *Financial*
- *Climate*
- *GIS*
- *Web analytics*

- Textual data

- *Social media*
- *Newspaper articles*

- Images

- *Photo's*
- *CCTV*
- *Movie*



INPUT DATA

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METHOD

ACQUIRE → PARSE → FILTER → ANALYSE → VISUALIZE → ENRICH → INTERACT

METHOD

ACQUIRE → PARSE → FILTER → ANALYSE → VISUALIZE → ENRICH → INTERACT

TEAM



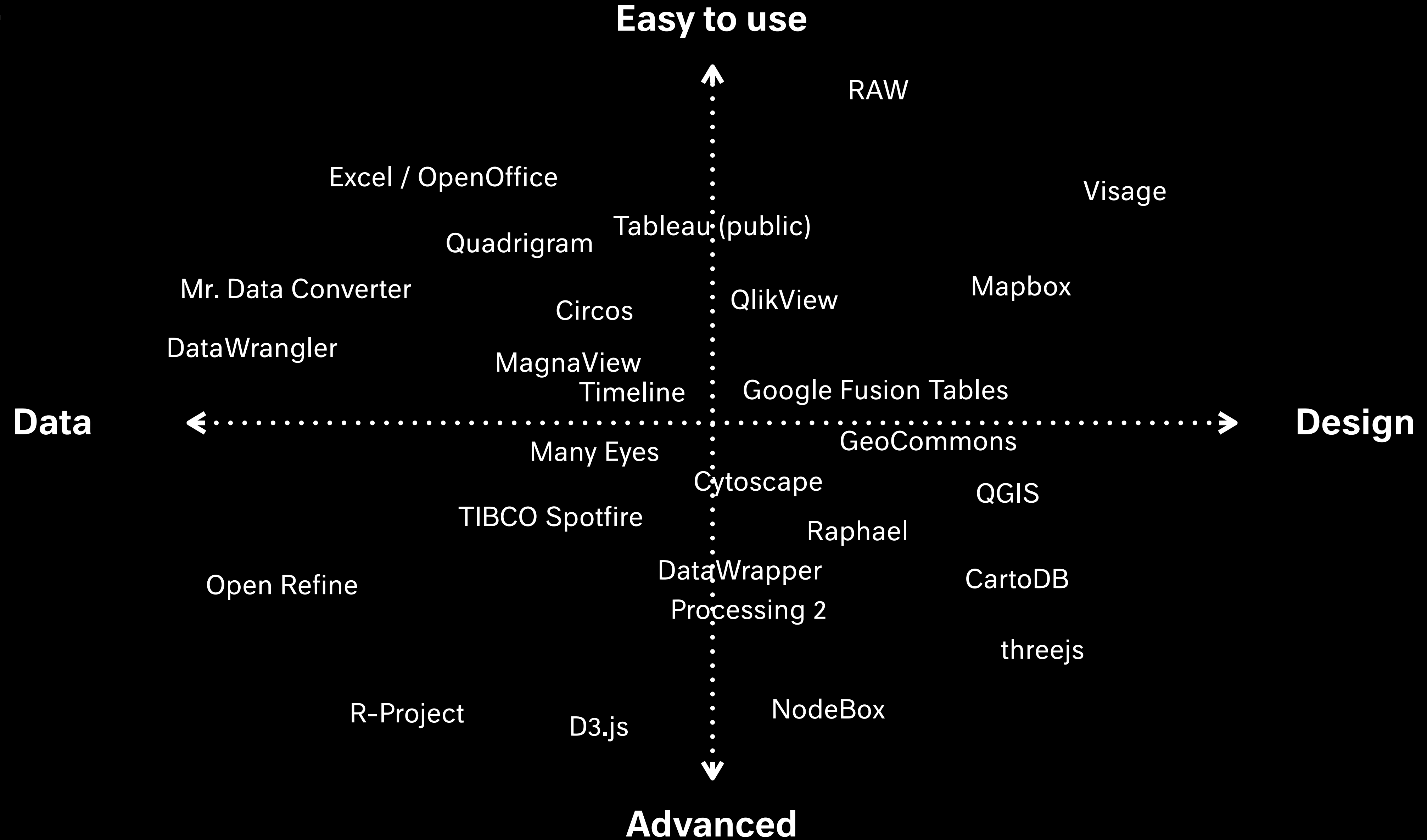
Source: Andy Kirk

TEAM

	Purpose & parameters	Prepare & explore data	Formulate questions	Design concepting	Construct & launch
Initiator					
Data Scientist					
Journalist					
Computer Scientist					
Designer					
Cognitive Scientist					
Communicator					
Project Manager					

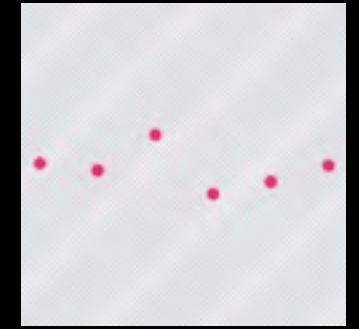
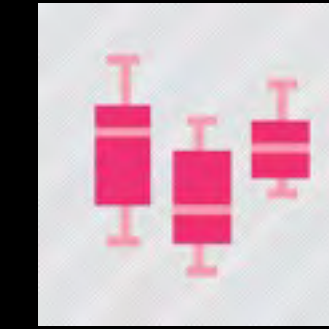
Source: Andy Kirk

TOOLS FOR VISUALIZATION

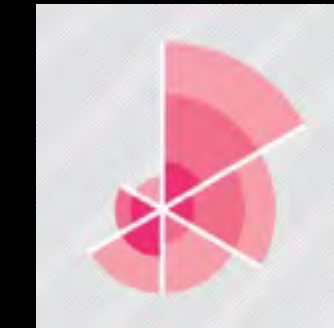
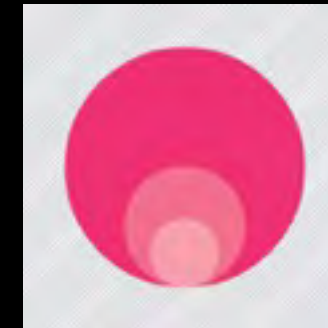
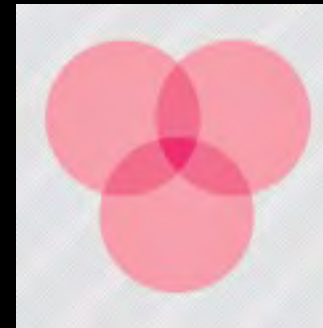


DIFFERENT CHART TYPES

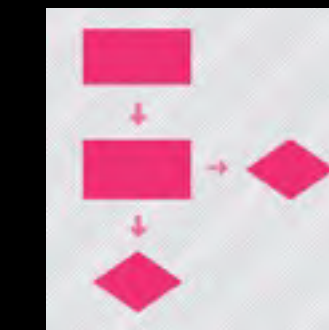
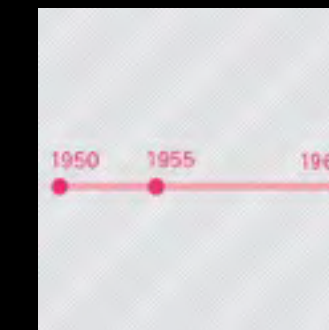
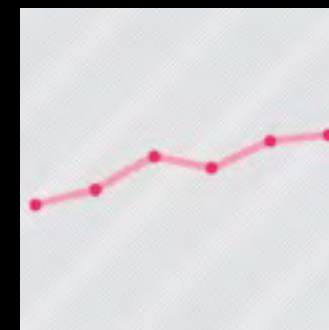
Comparing quantitative and categorical values



Charting hierarchical and part-to-whole relationships



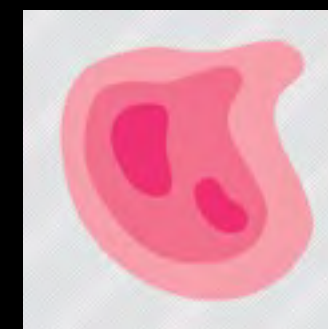
Plotting trends and changes over time



Graphing connections and multivariate relationships

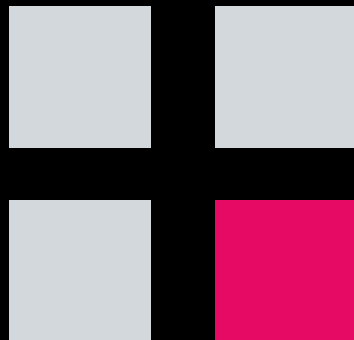


Mapping spatial data

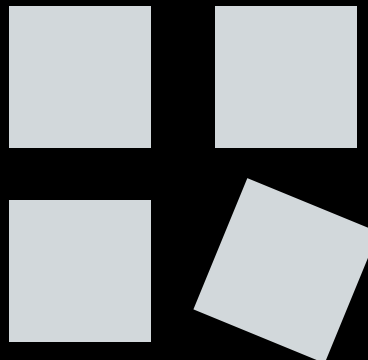


ADJUST

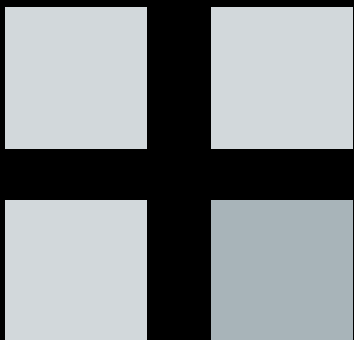
Hue



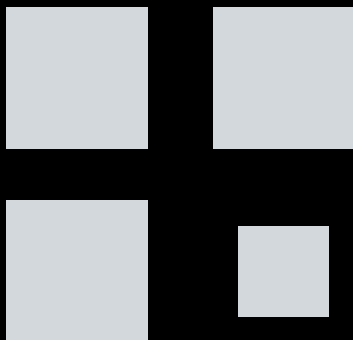
Orientation



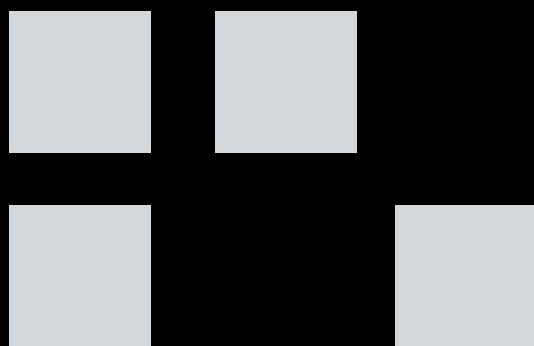
Intensity



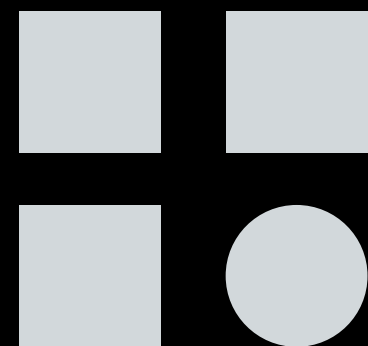
Size



Position



Shape



Message

Goals



Receiver

-➤ Make decisions
-➤ Viewing data in context
-➤ Finding patterns
-➤ Understanding a story
-➤ Getting inspired

Ensure the outcome is relevant for the user



Personal

Specific

Up to date

C°F

4 LESSONS LEARNED

Visualising the KPI's of a bank

DASHBOARD » DESIGN & DEVELOPMENT



2011

Sparen

Bezoek	+255.004
10.000 / ma	3.392.231 bz 2.561.890 bz
Aanvraag	+9.425
10.000 / ma	37.213 rek 42.890 rek
Afgesloten	+5.504
week 33 / '11	18.409 rek 23.571 rek
Obligato	€ +2,2 milj
week 33 / '11	€ 412,0 milj € 1 mld

Betalen

-20.152
137.213 bz 234.000 bz
-5138
56.000 rek 13.000
-1004
11.000 rek 22.000 rek

Verzekeren

-53.451
235.939 bz 345.232 bz
-23.454
234.939 rek 561.232 rek
-2.344
26.320 31.345

Hypotheeken

-53.454
345.663 bz 542.393 bz
+55.004
13.123 rek 18.889 rek
+55.004
5.432 rek 9.234 rek
€ +0,07 milj
€ 1,2 mld € 1,1 mld

Zak. sparen

-65.214
300.123 bz 495.345 bz
-17.955.004
735 milj rek 1.1 mld rek
€ -178,2 mln
€ 567,2 mln € 1 mld

Zak. betalen

+4.124
49.612 bz 95.340 bz
+258
2.230 rek 3.000 rek

Zak. hypotheeken

+155.899
1.045.543 bz 1.214.890 bz
+134
1.123 rek 2.000 rek
€ +11 milj
€ 311 milj € 30 milj

Service

Gebruikerstevredenheid
september / '11
4,6
> 3,00
aug 5,8
Gebruik serviceformulier
september / '11
+0,6
11,8 aanvr 12 aanvr
Q-go score
september / '11
27,03%
> 28,00
aug 26,09

Front-end

SLA Web Master Team
september / '11
97,11%
> 95,00
aug 97,04
Beschikbaarheid
september / '11
98,46%
> 99,95
aug 98,21
Performance
september / '11
14,03ms
> 16,00
aug 17,01

IV successen

Evangelisatiemomenten
september / '11
3,11%
> 5,00
aug 4,09
Medewerkerstrots
september / '11
98,23%
> 99,10
aug 97,09
Realisatie van projecten
september / '11
28,03%
> 26,00
aug 29,12

Betalen

1 / 2

CPO	september / '11	€ 12,12	aug: 11,18	> 13,00
Bezoek uit SEO	week 33 / '11	+52.345	1.165.875	1.561.134
Conversiepercentage	september / '11	52,6%	aug: 94,8	> 19,00
Conversiedoelen	september / '11	2	0	3
Q-go Score	week 33 / '11	79,67%	aug: 80,51	> 81,00
Experimenten	september / '11	-2	5	8
Extra KPI	week 33 / '11	+5.773	1.145.875	1.061.890
Extra KPI	september / '11	-2	5	8

Bezoek uit SEO

Toon overzicht score: per week per jaar

Legenda

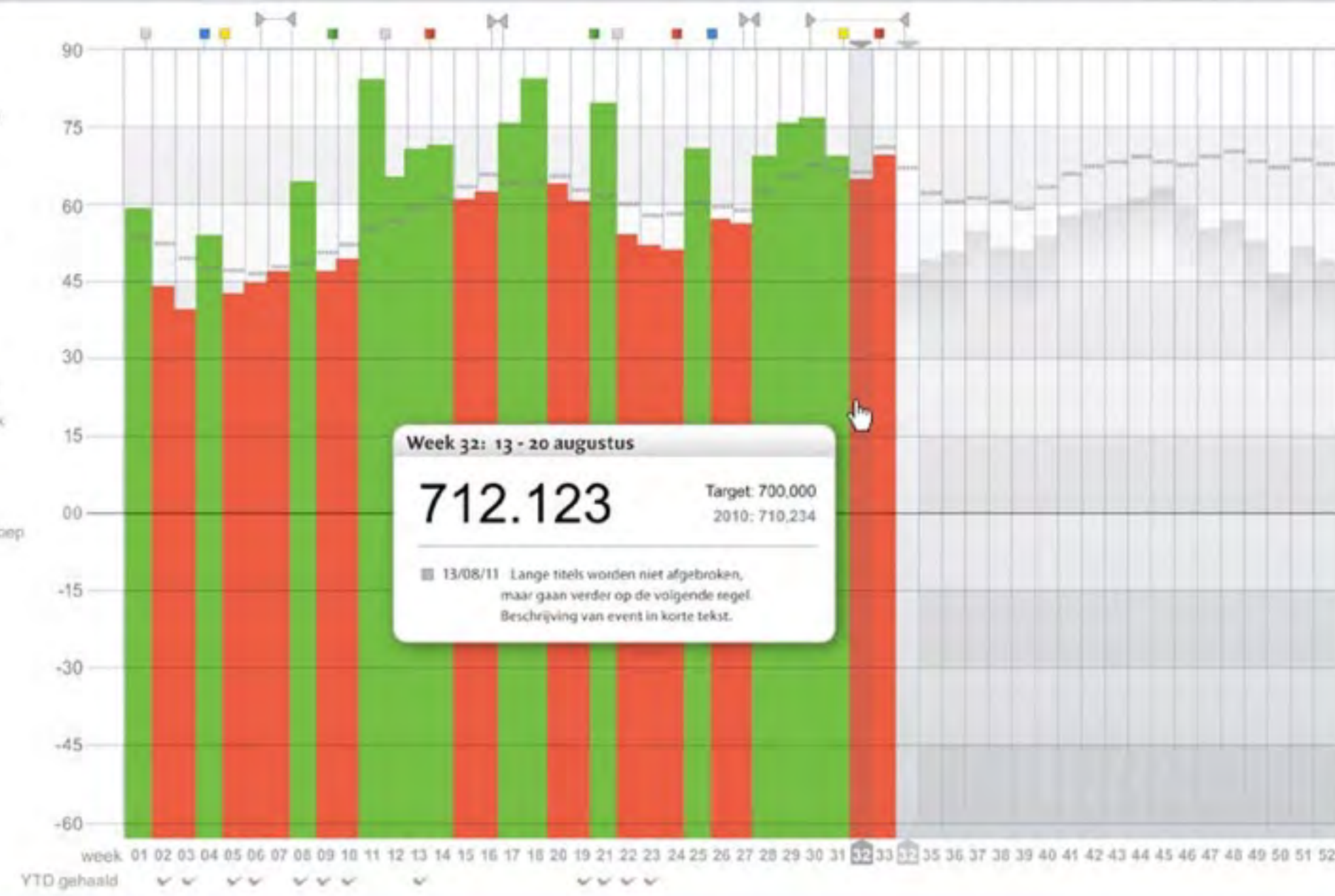
- Target
- Prognose

Events

- Rentewijziging
- Campagne
- Verbetering
- Experiment
- Feestdagen
- Media aandacht
- Wijzigingverzoek

Issues

- Binnen productgroep
- Binnen site



Feedback

2 / 4

- 13/03/2011 21:56 Het is niet mogelijk bij de reden van aanvraag nieuwe pas in te vullen dat de oude pas bijna verloopt.
- 13/03/2011 12:25 Het had wat duidelijker gemogen dat dit formulier ook bedoeld is om een extra betaalpas voor een mederekeninghouder aan te vragen.
- 13/03/2011 11:02 Zonder hoor en wederhoren is het lastig dit formulier in te vullen.

Meest gestelde vragen

1 / 2

- 1 Waarom is deze rente zo hoog van een Bank Participatie Certificaat?
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- 7 Wat is het telefoonnummer van de klantenservice?
- 8 Waar kan ik verzekerings schade melden?

Issue & event list

1 / 3

- 08/01/11 Lorum ipsum
- 25/02/11 Lorum ipsum hadngy
- 12/04/11 Lange titels worden niet afgebroken, maar gaan verder op de volgende regel.
- 23/05/11 Lorum ipsum hadngy
- 24/05/11 Lorum ipsum hadngy
- 26/05/11 Lorum ipsum hadngy
- 31/05/11 Lorum ipsum hadngy
- 11/06/11 Lorum ipsum hadngy

Contactpersonen

1 / 2

- Thomas Clever
thomas@cleverfranke.com
0612345678
- Gert Franke
gert@cleverfranke.com
0612345678
- Gijs B. Roest
gij@cleverfranke.com
0612345678



Verzekeren

-55.004

348.939 bz

561.232 bz

-42.114

298.939 rek

361.232 rek

+258

2.230 rek

3.000 rek

€ +2,2 mld

€ 1,820,0 mlj

€ 2,2 mld



Hypotheeken

+4.124

59.600 bz

100.000 bz

+51.523

123.368 rek

111.889 rek

-3.004

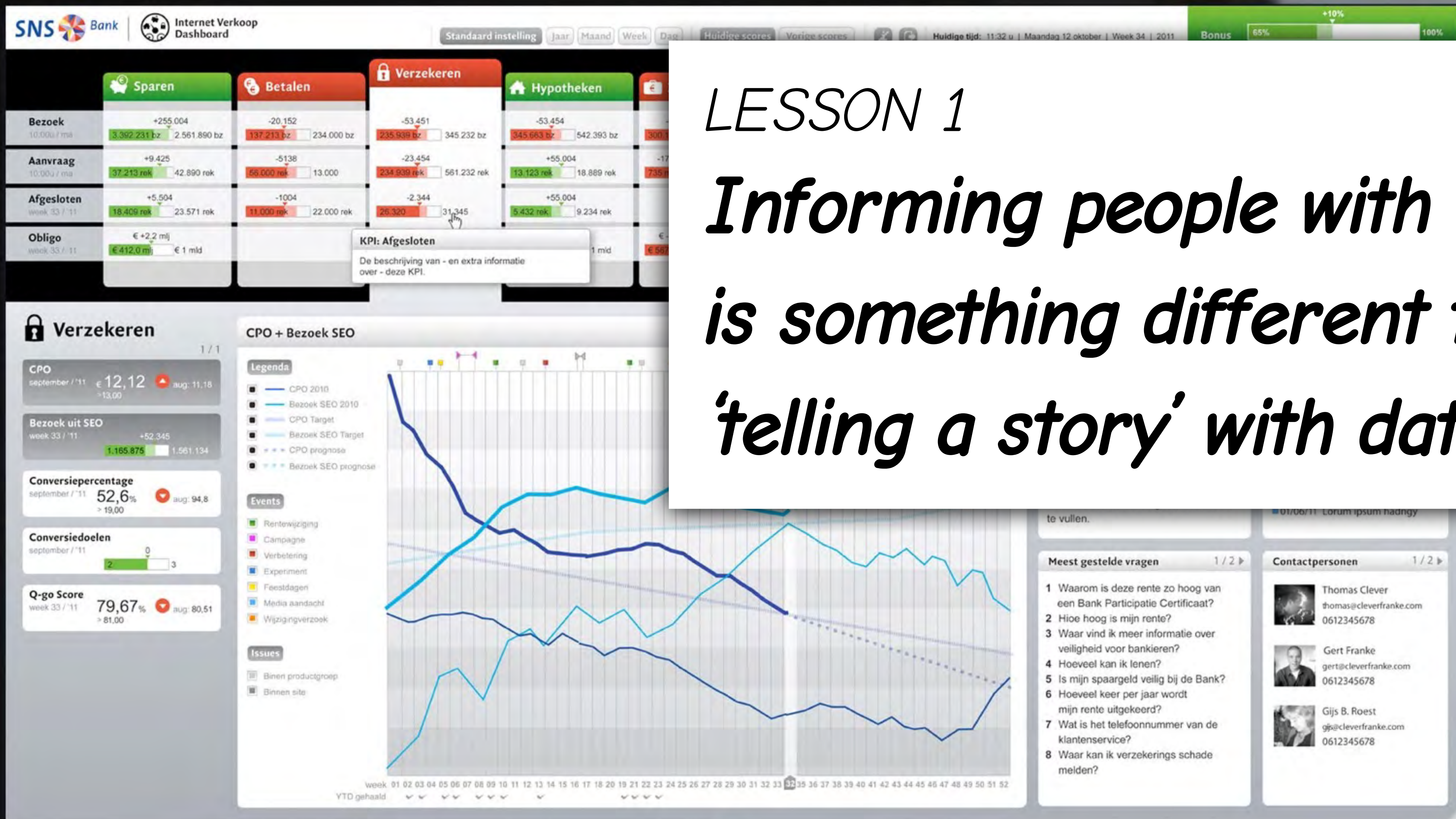
13.900 rek

23.000 rek

€ +0,06 mlj

€ 1,3 mld

€ 1,5 mld



LESSON 1

Informing people with data is something different than 'telling a story' with data

	Sparen	Betalen	Verzekeren	Hypotheken	Zak. sparen	Zak. betalen	Zak. hypotheken	Service	Front-end	IV successen
Bezoek	+255.004 10.000 / ma 3.392.231 bz 2.561.890 bz	-20.152 137.213 bz 234.000 bz	-53.451 235.939 bz 345.232 bz	-53.454 345.663 bz 542.393 bz	-65.214 300.123 bz 495.345 bz	+4.124 49.612 bz 95.340 bz	+155.899 1.045.543 bz 1.214.890 bz	Gebruikerstevredenheid september / '11 4,6 > 3,00 aug 5,8	SLA Web Master Team september / '11 97,11% > 95,00 aug 97,04	Evangelisatiemomenten september / '11 3,11% > 5,00 aug 4,09
Aanvraag	+9.425 10.000 / ma 37.213 rek 42.890 rek	-5138 56.000 rek 13.000	-23.454 234.939 rek 561.232 rek	+55.004 13.123 rek 18.889 rek	-17.955.004 735 milj rek 1.1 mid rek		+134 1.123 rek 2.000 rek	Gebruik serviceformulier september / '11 +0,6 11,8 aanvr 12 aanvr	Beschikbaarheid september / '11 98,46% > 99,95 aug 98,21	Medewerkerstrots september / '11 98,23% > 99,10 aug 97,09
Afgesloten	+5.504 week 33 / '11 18.409 rek 23.571 rek	-1004 11.000 rek 22.000 rek	-2.344 26.320 31.345	+55.004 5.432 rek 9.234 rek		+258 2.230 rek 3.000 rek		Q-go score september / '11 27,03% > 28,00 aug 26,09	Performance september / '11 14,03ms > 16,00 aug 17,01	Realisatie van projecten september / '11 28,03% > 26,00 aug 29,12
Obligo	€ +2,2 milj week 33 / '11 € 412,0 milj € 1 mid		KPI: Afgesloten De beschrijving van - en extra informatie over - deze KPI.	1 mid	€ -178,2 mln € 567,2 mln € 1 mid		€ +11 milj € 311 milj € 30 milj			

Verzekeren

1 / 1

CPO
september / '11 € 12,12
> 13,00
aug: 11,18Bezoek uit SEO
week 33 / '11 +52.345
1.165.875 1.561.134Conversiepercentage
september / '11 52,6%
> 19,00
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september / '11 2 0 3Q-go Score
week 33 / '11 79,67%
> 81,00
aug: 80,51

CPO + Bezoek SEO

Toon overzicht score: per week per jaar

Legenda

- CPO 2010
- Bezoek SEO 2010
- CPO Target
- Bezoek SEO Target
- CPO prognose
- Bezoek SEO prognose

Events

- Rentewijziging
- Campagne
- Verbetering
- Experiment
- Feestdagen
- Media aandacht
- Wijzigingverzoek

Issues

- Binnen productgroep
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2 / 4

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13/03/2011 12:25 Het had wat duidelijker gemogen dat dit formulier ook bedoeld is om een extra betaalpas voor een mederekeninghouder aan te vragen.

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Issue & event list

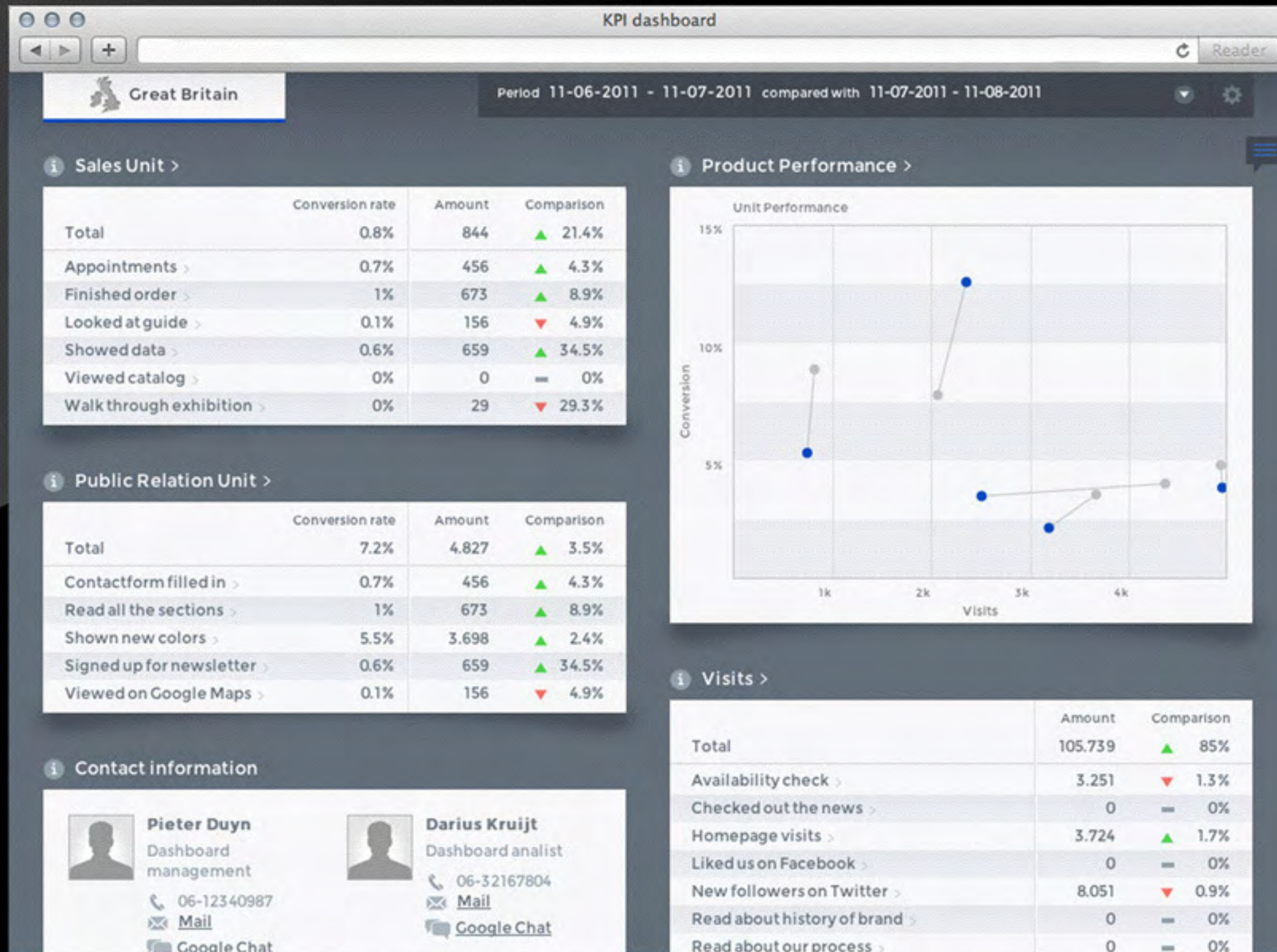
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- 26/05/11 Lorum ipsum hadngy
- 31/05/11 Lorum ipsum hadngy
- 01/06/11 Lorum ipsum hadngy

Contactpersonen

1 / 2

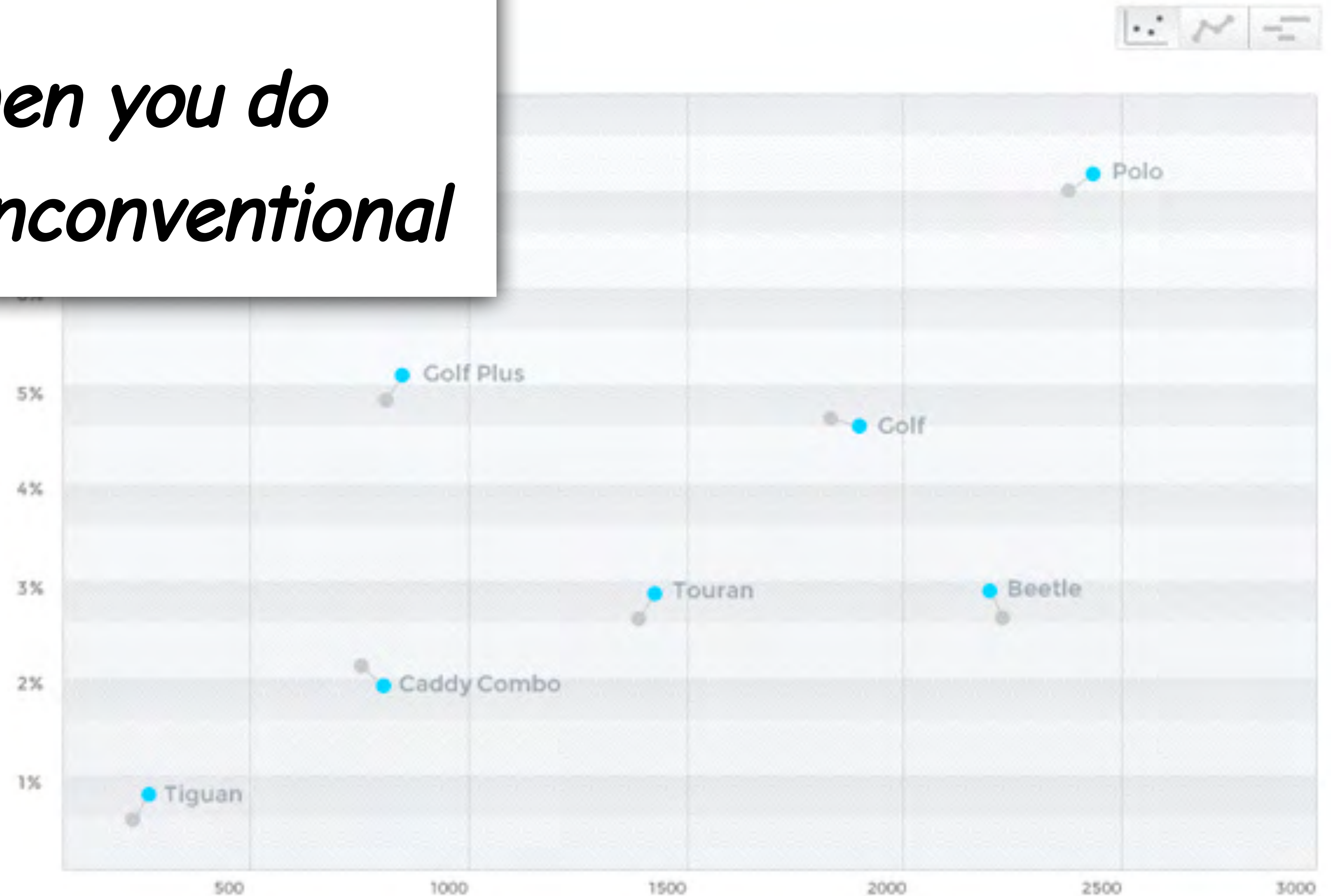
- Thomas Clever
thomas@cleverfranke.com
0612345678
- Gert Franke
gert@cleverfranke.com
0612345678
- Gijs B. Roest
gijs@cleverfranke.com
0612345678



LESSON 2

Be aware when you do something unconventional

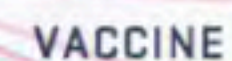
9.952	5,1%
Passat CC >	
9.952	5,1%
Sharan >	
9.952	5,1%
Touareg >	
9.952	5,1%
Phaeton >	
9.952	5,1%
Phaeton >	
9.952	5,1%
+ VW Bedrijfswagens >	
+ Audi >	
+ SKODA >	
+ SEAT >	



Find in intuitive way patterns, relations and sentiments in online news and social media

PRODUCT » DESIGN & DEVELOPMENT





SHOWING 10 RELATED TOPICS

LEAST RELEVANT

vaccine

ebo

guinea

anti

111

reuters

children

virus

Britain

virus

Britain

2

● One dose of HPV vaccine may prevent cervical cancer - World - New Straits Times
29 mrt 2014 • 16:07 • WWW.NST.COM.MY

● One dose of HPV vaccine may prevent cervical cancer - World - New Straits Times
31 mrt 2014 • 16:08 • WWW.NST.COM.MY

● One dose of HPV vaccine may prevent cervical cancer - World - New Straits Times
30 mrt 2014 • 02:06 • WWW.NST.COM.MY

● Scant funds, rare outbreaks leave Ebola drug pipeline slim - Yahoo News
27 mrt 2014 • 16:55 • NEWS.YAHOO.COM

● One dose of HPV vaccine may prevent cervical cancer - World - New Straits Times
28 mrt 2014 • 12:08 • WWW.NST.COM.MY

● Costs, uncertainty hamper Ebola vaccine | The Japan Times
28 mrt 2014 • 14:08 •
WWW.JAPANTIMES.CO.JP

• WHO Officials Rig Inclusion Criteria for Vaccine Injury in Developing World - AGE OF AUTISM
26 mrt 2014 • 09:57 •
WWW.AGE OF AUTISM.COM

● One dose of HPV vaccine may prevent cervical cancer - World - New Straits Times
27 mrt 2014 • 20:10 • WWW.NST.COM.MY

● The Week's Worst Clinical Failures (GSK, INCY)
26 mrt 2014 • 18:31 • WWW.FOOL.COM

- One dose of HPV vaccine may prevent

TABLETS

LESSON 3

*Creating data visualizations is
time consuming*

*(especialing when you try to find
new ways to visualize things)*

27 mrt 2014 • 15:35 - 29 mrt 2014 • 05:46

9 Articles containing TABLETS:

- GlaxoSmithKline recalls weight loss drug Alli after foreign pills found in bottles - newsnet5.com Cleveland
27 mrt 2014 • 16:21 • WWW.NEWSNET5.COM
- GSK recalls weight-loss drug Alli in U.S. on tampering concerns | Reuters
27 mrt 2014 • 16:58 • WWW.REUTERS.COM
- KELOLAND.com | Thursday Afternoon Business Brief
27 mrt 2014 • 19:01 • WWW.KELOLAND.COM
- Business Highlights
27 mrt 2014 • 22:29 • MTSTANDARD.COM
- Consumers alerted GlaxoSmithKline that bottles of alli contained bogus pills - UPI.com
28 mrt 2014 • 05:15 • WWW.UPI.COM
- Consumers alerted GlaxoSmithKline that bottles of alli contained bogus pills - UPI.com
28 mrt 2014 • 20:26 • WWW.UPI.COM
- Alli weight loss products recalled due to potential tampering - TheIndyChannel.com
28 mrt 2014 • 11:38 • WWW.THEINDYCHANNEL.COM
- Consumers alerted GlaxoSmithKline that bottles of alli contained bogus pills - UPI.com
29 mrt 2014 • 05:46 • WWW.UPI.COM
- GSK recalls weight-loss drug Alli in U.S. on tampering concerns - Yahoo News
27 mrt 2014 • 15:35 • NEWS.YAHOO.COM

CASE:

Visualising Chicago's mobility and infrastructure towards a prosperous future.

—
WEBSITE » ANALYSIS, DESIGN & DEVELOPMENT



Chicago Metropolitan
Agency for Planning

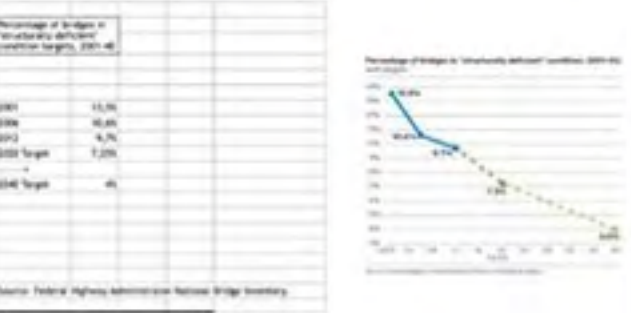


STRATEGY WORKSHOPS

STAKEHOLDER
& USER RESEARCH



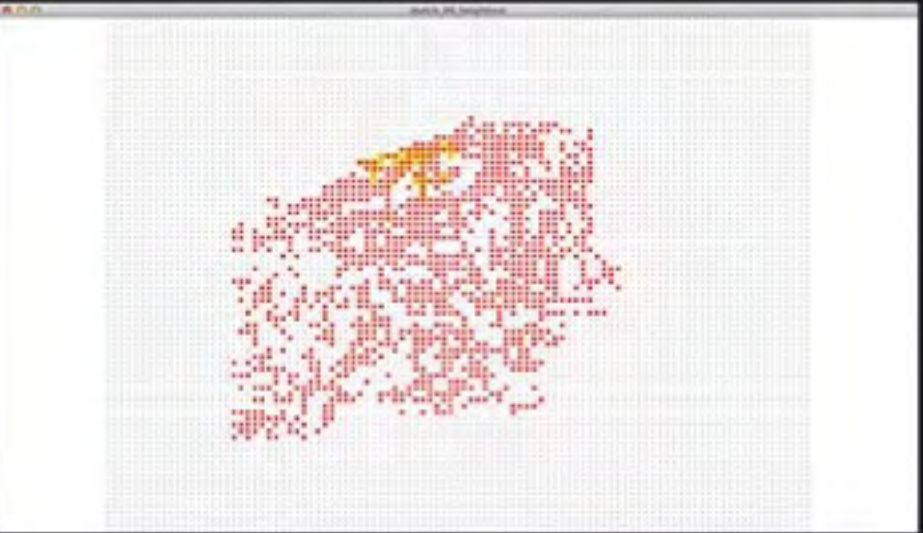
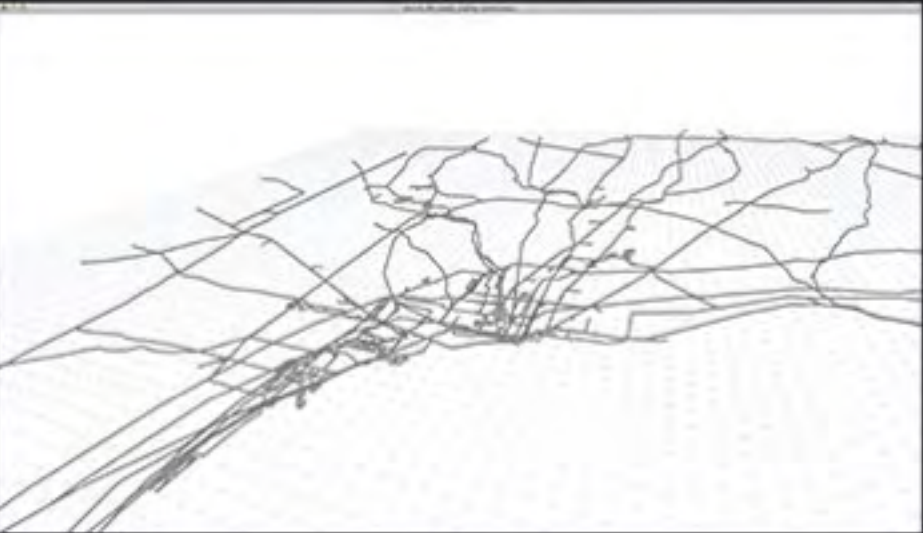
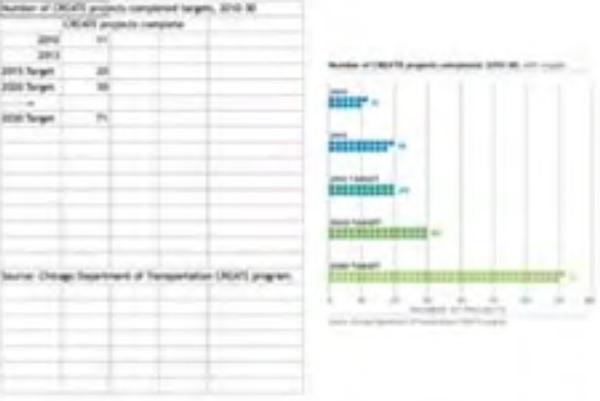
Percentage of bridges in "structurally deficient" condition



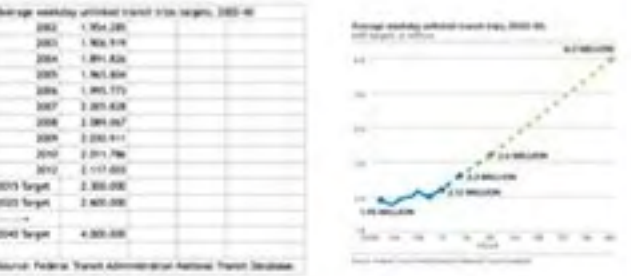
At-grade highway-rail crossing delay



CREATE project completion



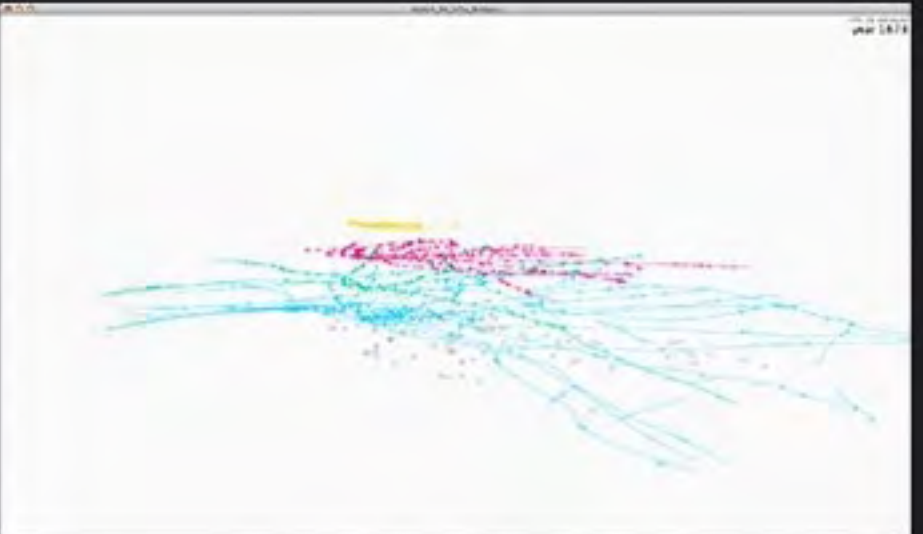
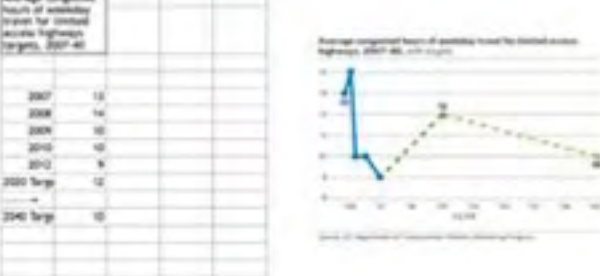
Average weekday unlinked transit trips



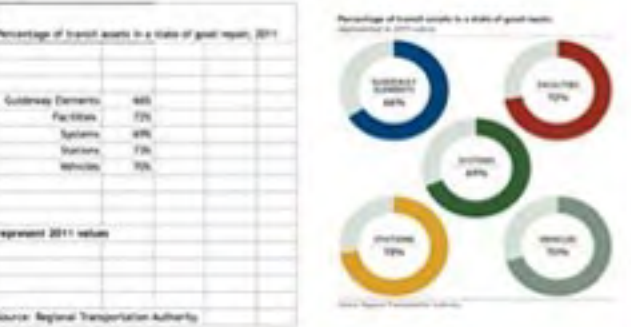
Population and Jobs with at least moderate access to transit



Average congested hours of weekday travel for limited access highways



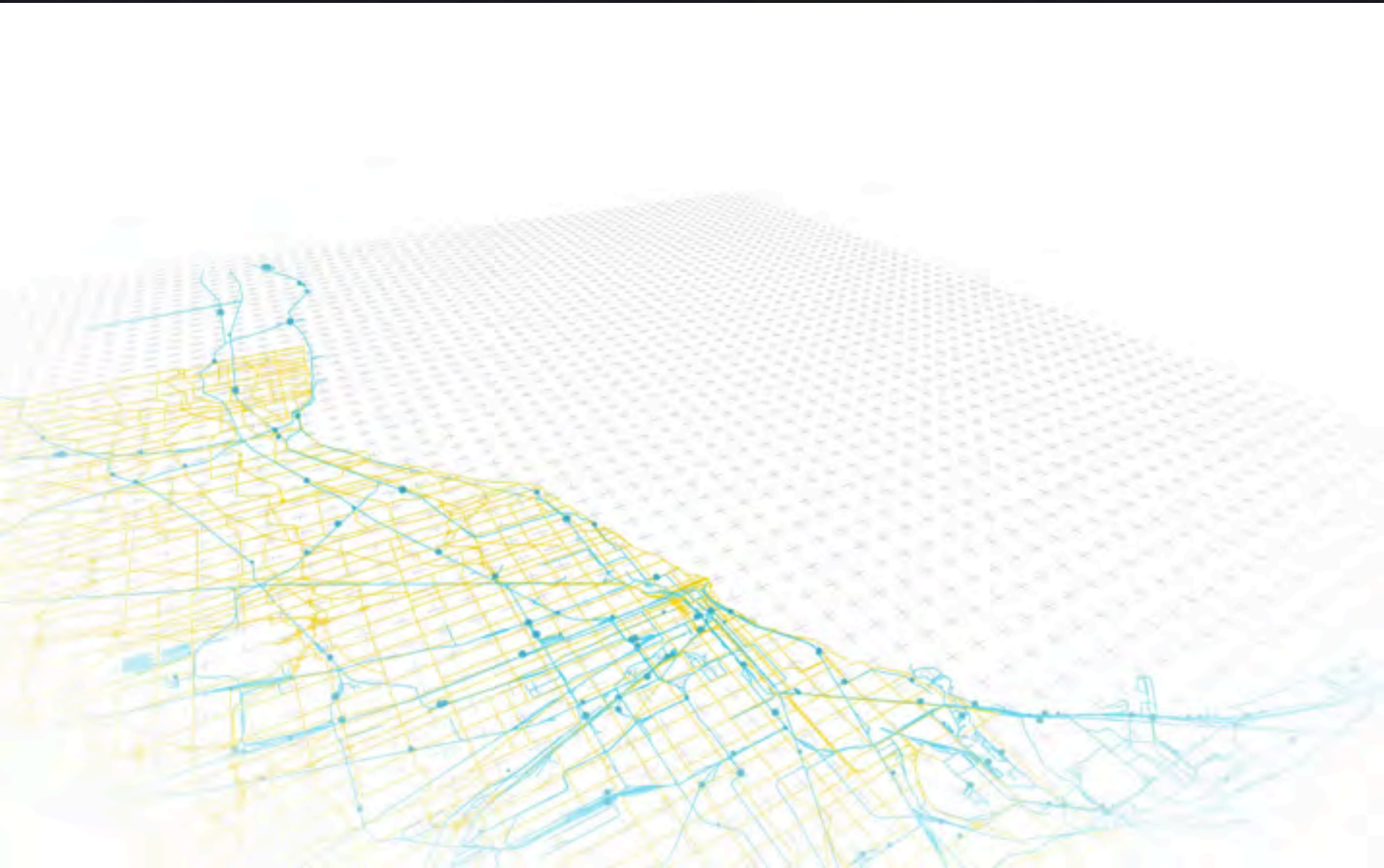
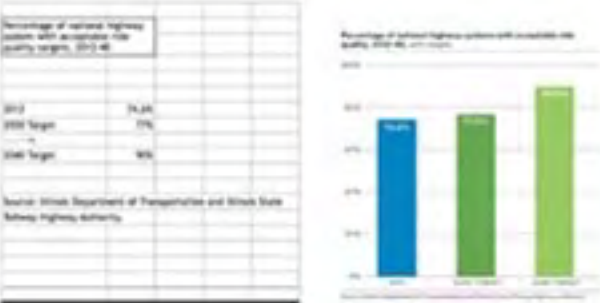
Percentage of transit assets in a state of good repair



Bridge condition information goes deep



Percentage of national highway system with acceptable ride quality





Mobility: engine of our regional economy



START TO EXPLORE

RAIL

3,865 MILES

ROAD

29,989 MILES



<http://www.cmap.illinois.gov>

our regional economy
Peek under the hood of the transportation

Roads

The region must invest wisely because we cannot build our way out of congestion, which costs more than \$7 billion each year in lost fuel and productivity.

HOME

ROADS

CONGESTION

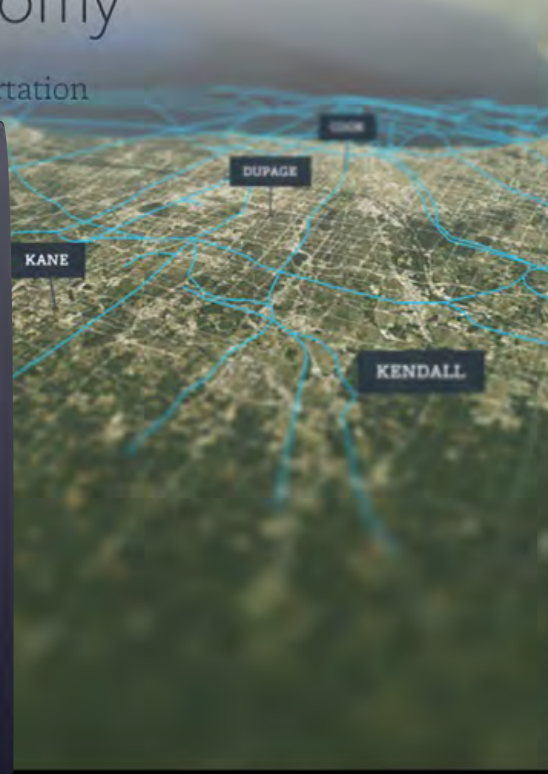
RISE QUALITY

BRIDGE CONDITION

TRANSIT

FREIGHT

FORWARD



Freight

Our region and nation must emphasize the importance of metropolitan Chicago as America's leading freight hub.

HOME

ROADS

TRANSIT

FREIGHT

CROSSING DELAY

CREATE

FORWARD



Transit

The region must increase its commitment to making public transit the preferred option for getting around.

HOME

ROADS

TRANSIT

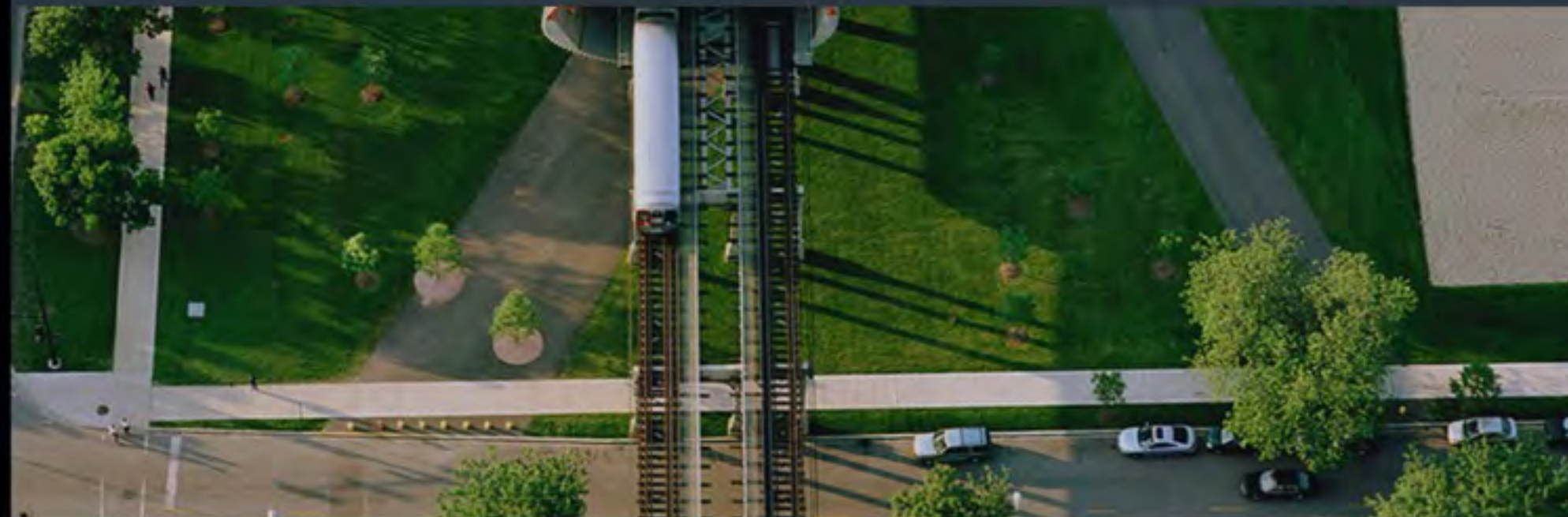
ACCESS

RIDERSHIP

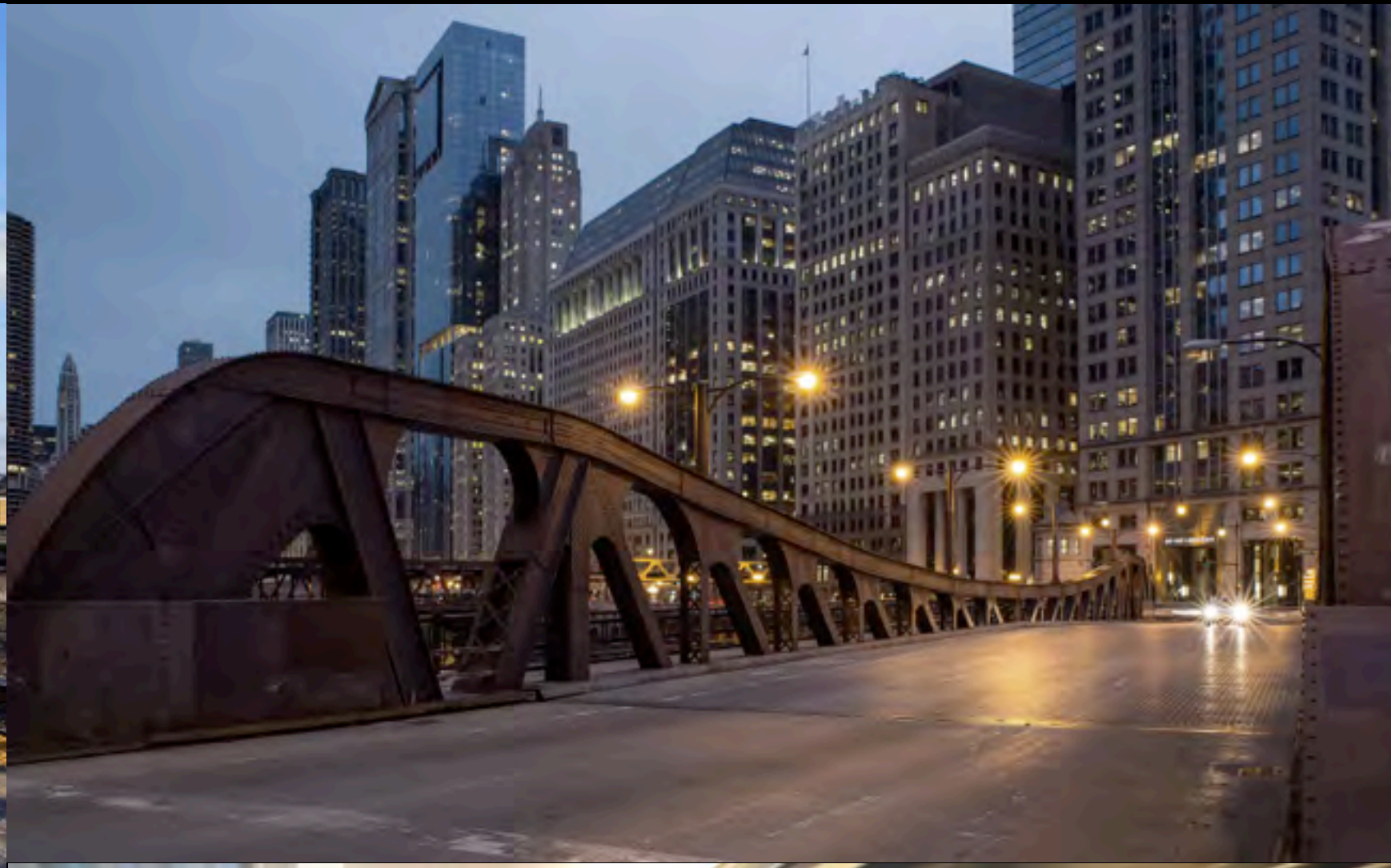
MAINTENANCE

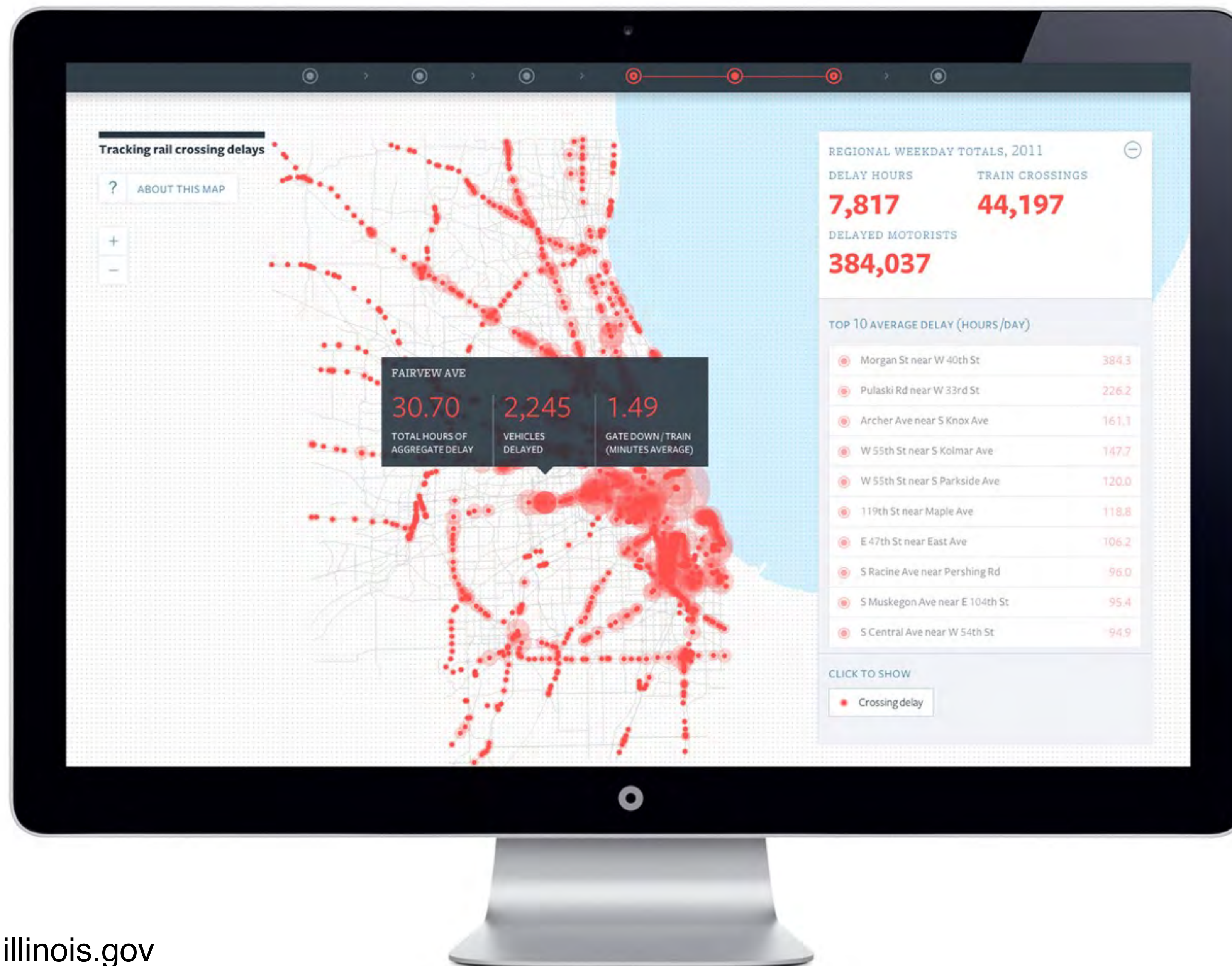
FREIGHT

FORWARD

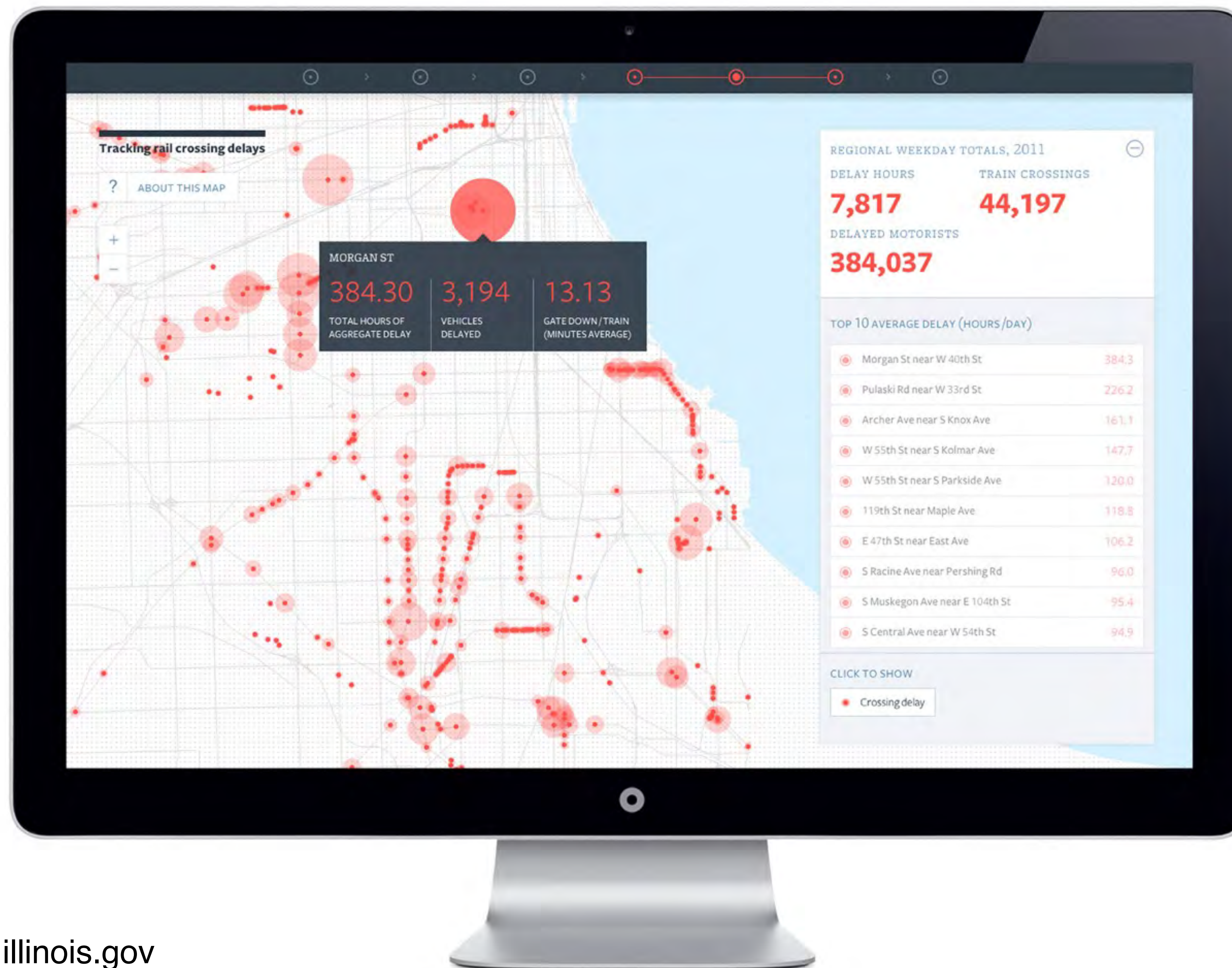


<http://www.cmap.illinois.gov>





<http://www.cmap.illinois.gov>



<http://www.cmap.illinois.gov>

Weekday rail transit ridership

? ABOUT THIS MAP

CTA BOARDINGS PER
WEEKDAY

726,459

METRA BOARDINGS PER
WEEKDAY

267,913

CLICK TO SEE BOARDINGS BY TRAIN LINE AND STATION

CTA 'L' SYSTEM

METRA SYSTEM

CLICK TO SHOW

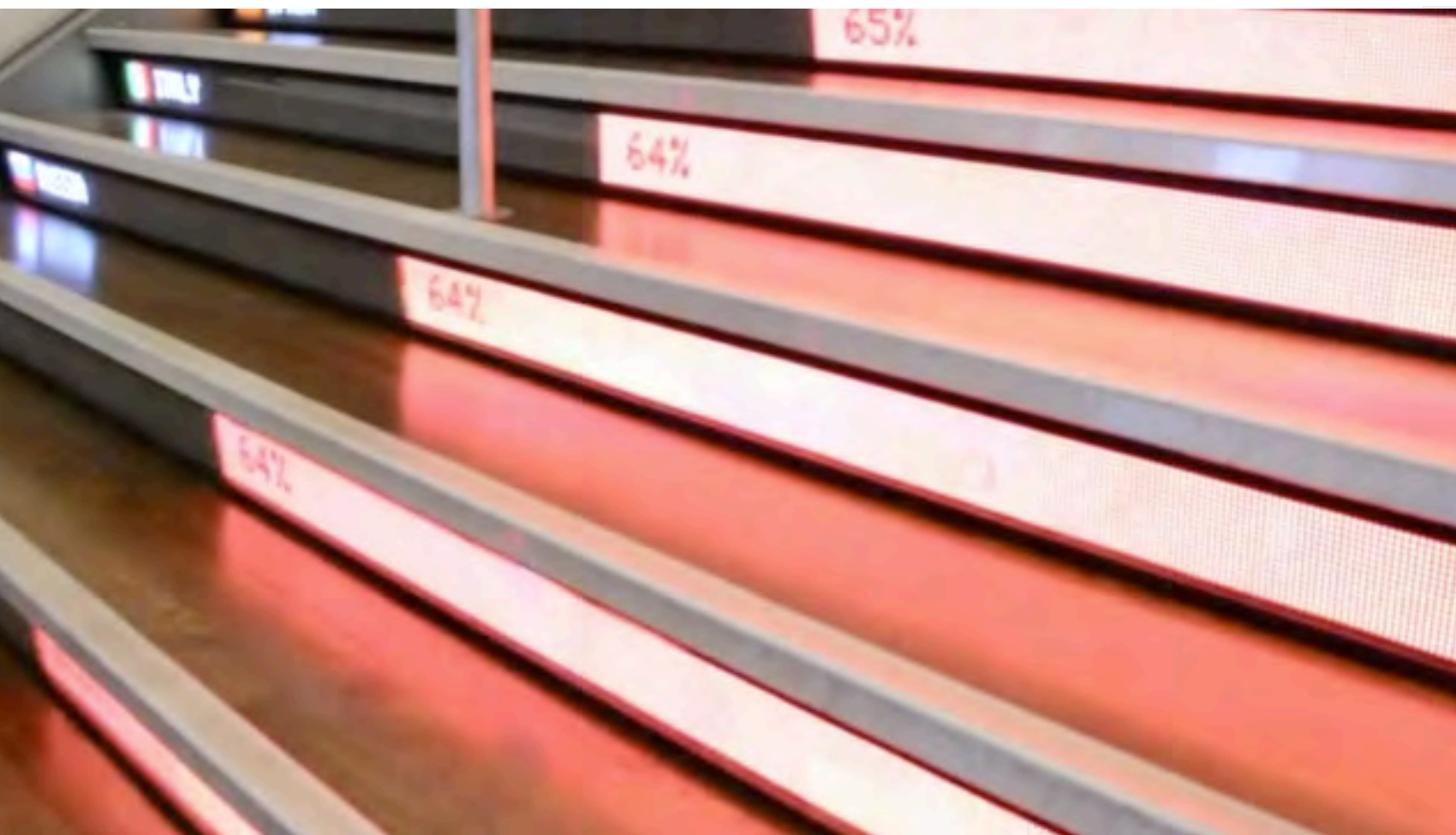
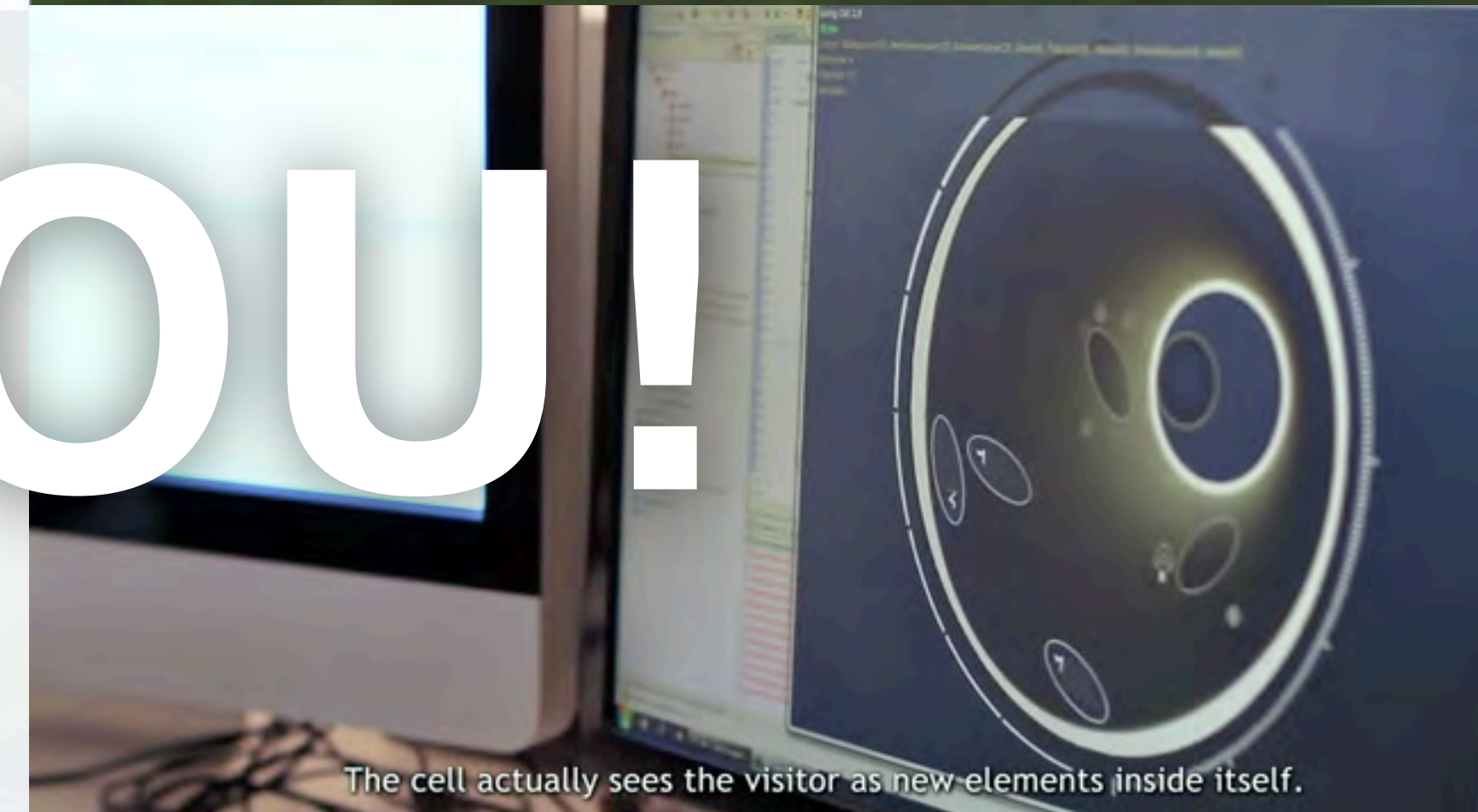
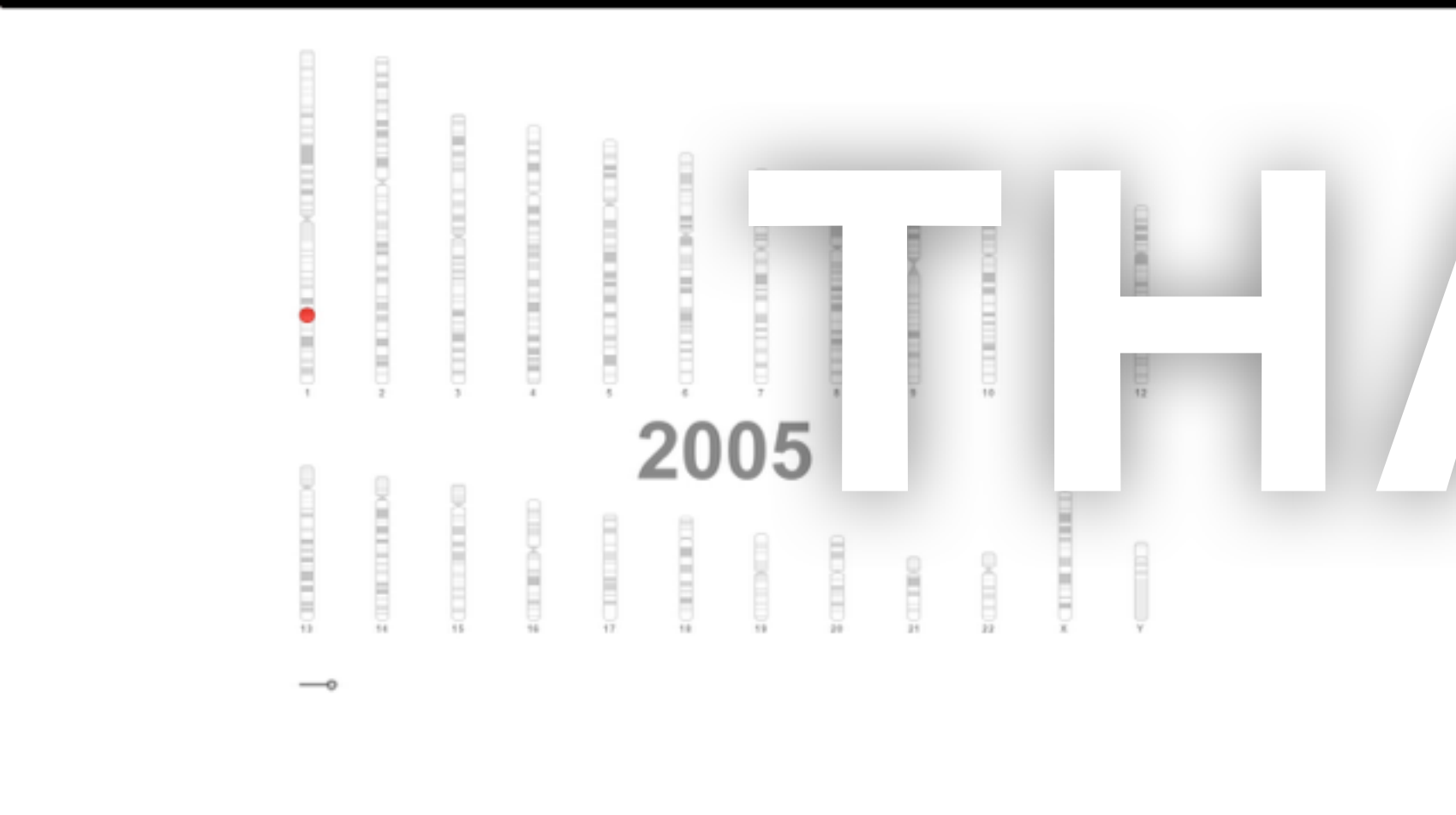
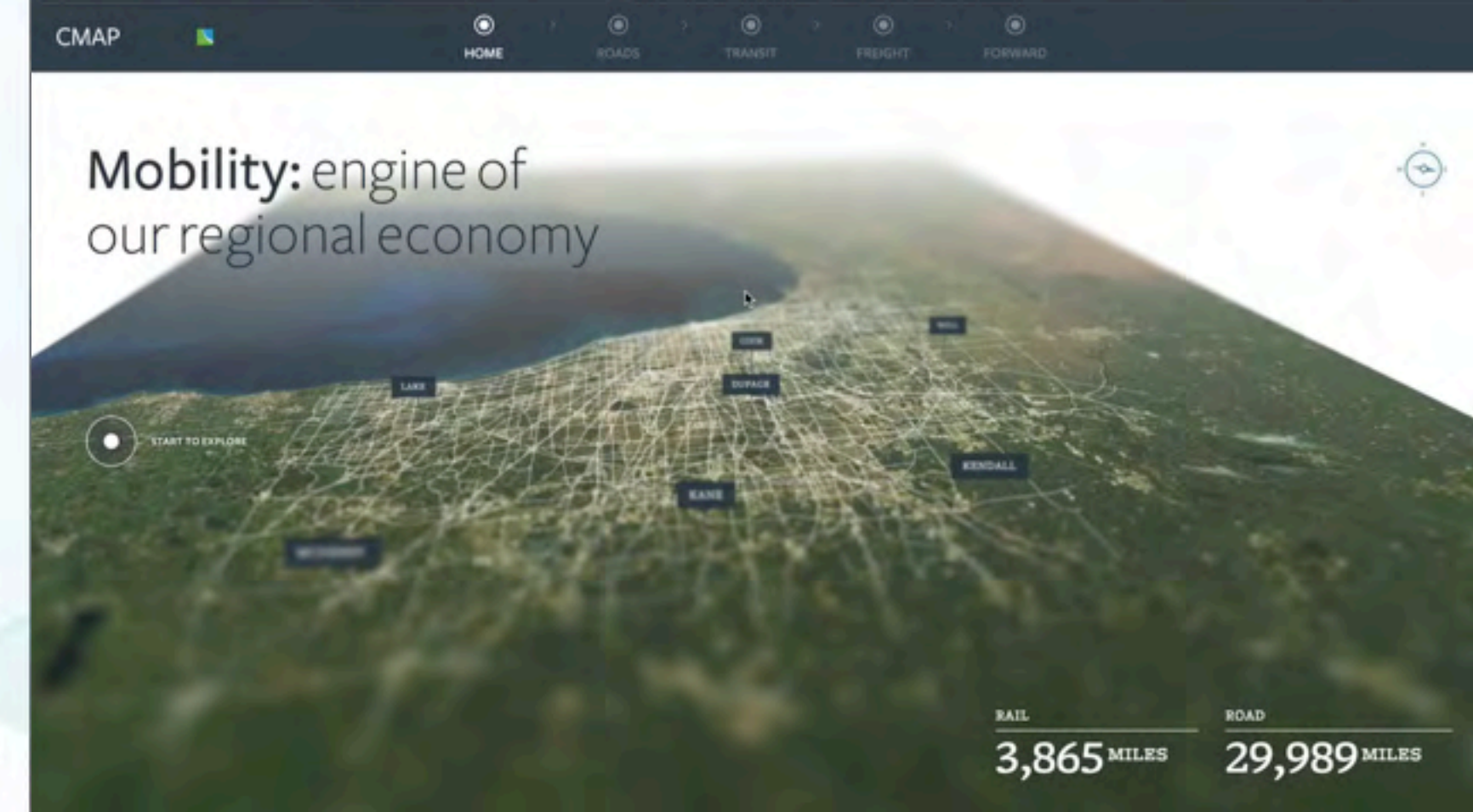
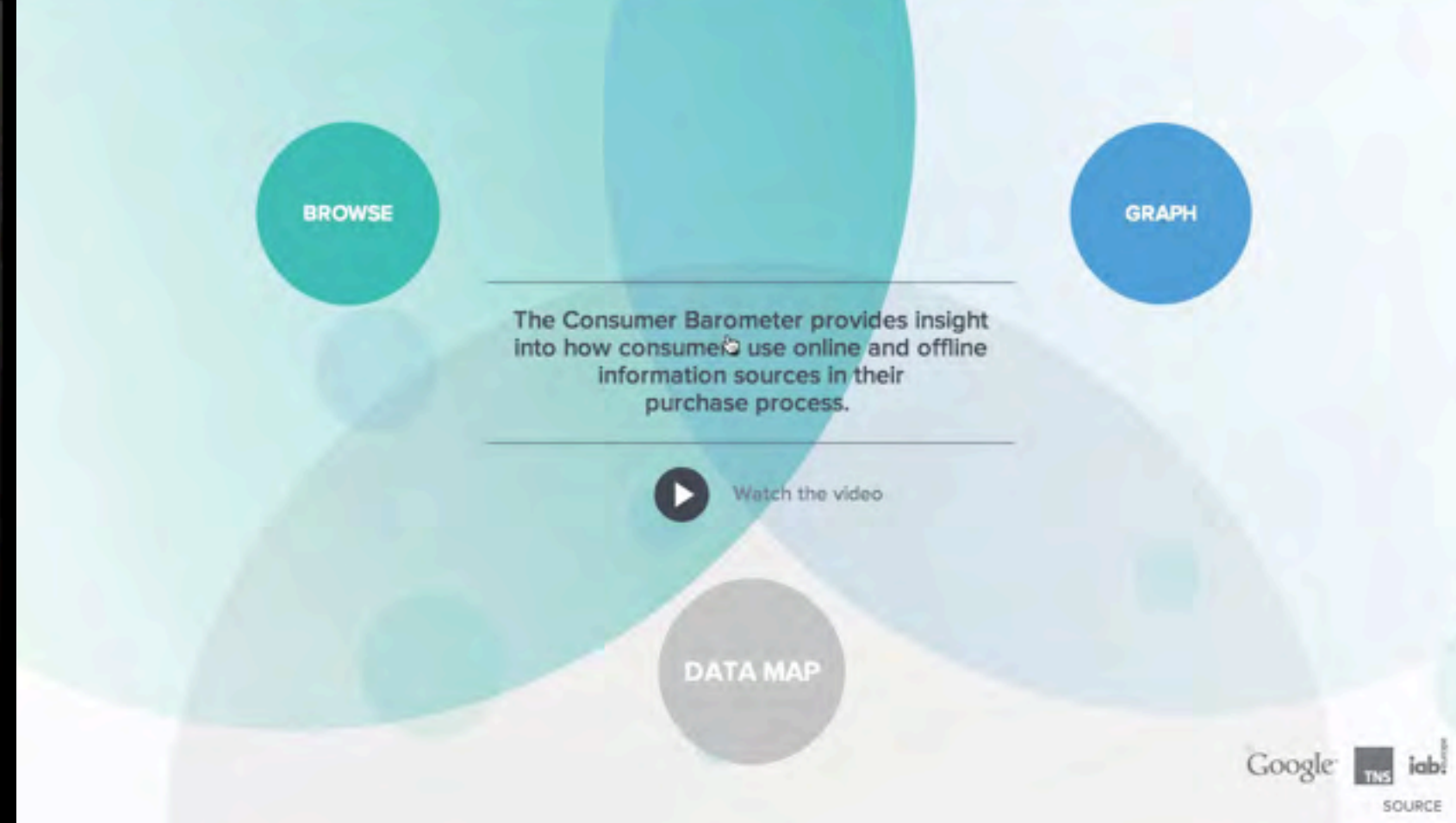
© Weather.com 10/18/2019

FOX 32

TOMORROW  33° 9:29

LESSON 4

Teamwork is crucial to create results like these



cleverfranke.com

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Further Reading

Design for Information

Isabel Meirelles

Data Visualization: A successful design process

Andy Kirk

The Functional Art - an introduction to information graphics and visualization

Alberto Cairo

Designing Data Visualization

Noah Iliinsky & Julie Steele

A Practical Guide to Designing with Data

Brian Suda

Visualize This: The Flowing Data Guide to Design, Visualization, and Statistics

Nathan Yau

The Visual Display of Quantitative Information

Edward Tufte

Getting Started with Processing

Casey Reas and Ben Fry.

The Design of Everyday Things

Donald Norman

Visual Language for Designers

Connie Malamed

The Practical Guide to Information Design.

Ronnie Lipton

Ways of Seeing

John Berger

Visual Complexity: Mapping Patterns of Information

Manuel Lima

The Book of Trees: Visualizing Branches of Knowledge

Manuel Lima

Visual Storytelling: Inspiring a New Visual Language

R. Klanten, S. Ehmann, F. Schulz

C°F

Tools

Overview of tools

<http://www.visualisingdata.com/index.php/resources/>

<http://selection.datavisualization.ch/>

Video

Hans Rosling

<http://www.ted.com/talks/>

[hans_rosling_shows_the_best_stats_you_ve_ever_seen](#)

Archive

Statistical Atlas of the United States (1870 - 1890)