

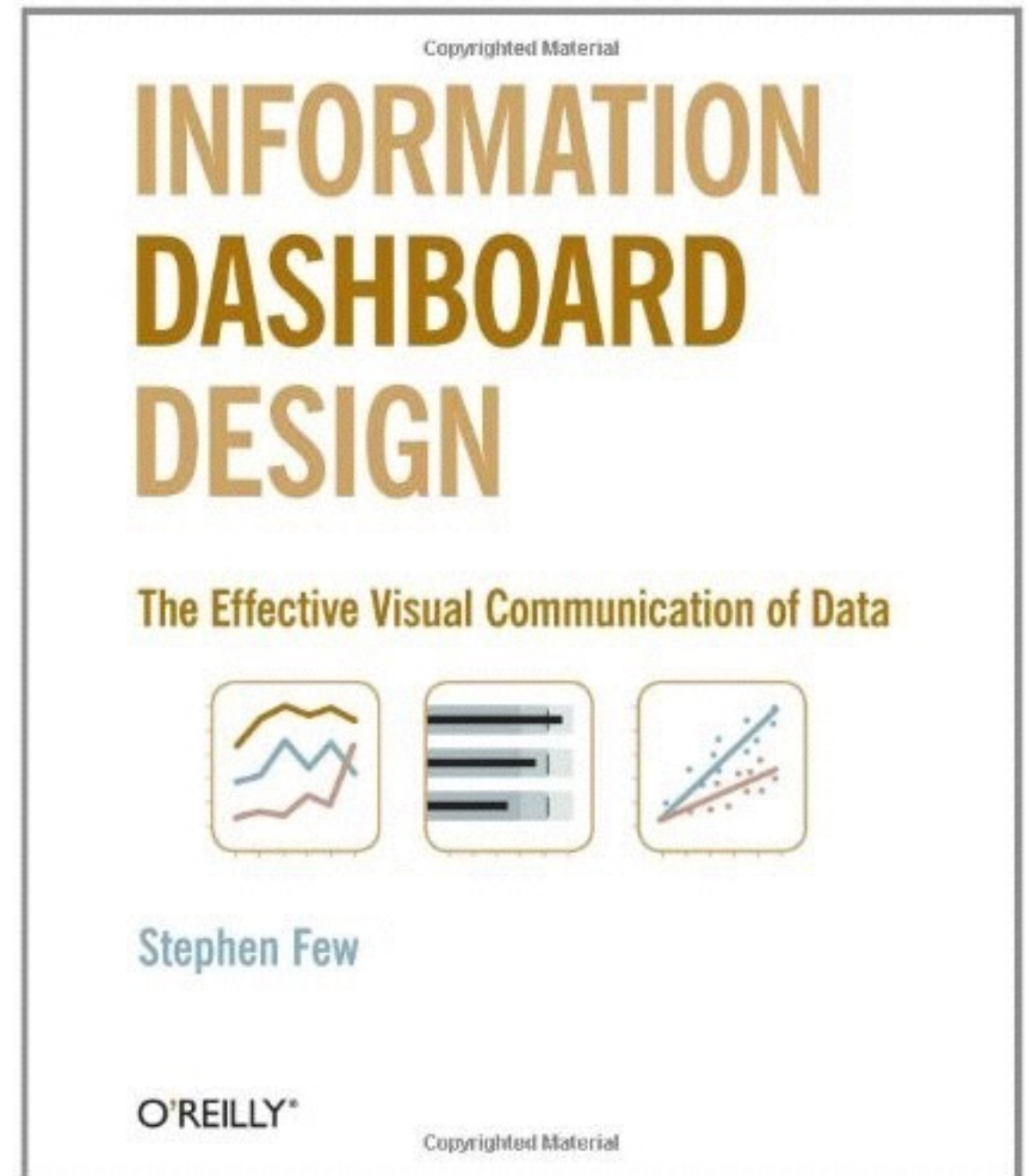
# Tableaux de bord

Géovisualisation dynamique et traitement de données

Christian Kaiser – Cours 4

# Tableau de bord = Dashboard

- «A visual display of the most important information needed to achieve one or more objectives which fits entirely on a single computer screen so it can be monitored at a glance». Stephen Few





# Tableau de bord



# Tableau de bord

- Avant tout: outil de **communication**
- Mise à jour en «temps réel»
- Donne l'état actuel d'un système
- Regroupe plusieurs outils de visualisation, avec des tableaux, etc.
- Peut être interactif ou non

# Tableau de bord: points importants

- .. **Qui** va utiliser l'information?
- .. Quels types de **décisions**?
- .. Quelle information est **requis**e?
- .. Quelle information est déjà **disponible**?
- .. Quelle information est **attendue**?
- .. Comment le tableau de bord va ajouter une **plus-value**?



# Audience Overview

Feb 14, 2015 - Mar 16, 2015

Email Export Add to Dashboard Shortcut



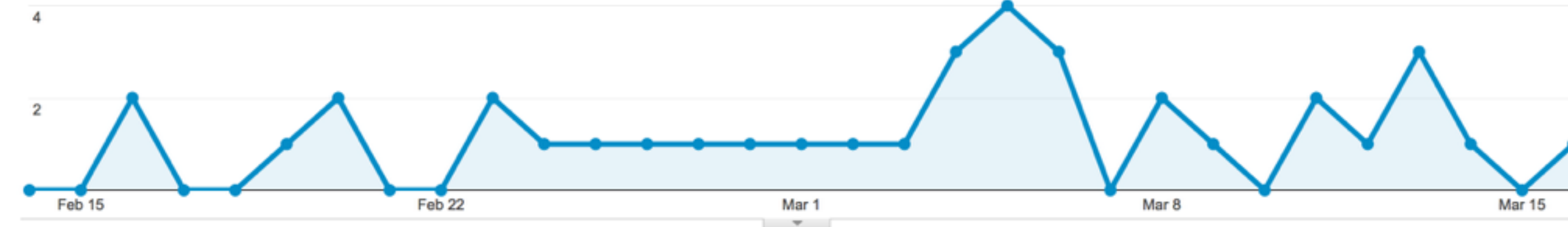
All Sessions 100.00% + Add Segment

## Overview

Sessions vs. Select a metric

Hourly Day Week Month

Sessions



Sessions

36



Users

30



Pageviews

42



Pages / Session

1.17



Avg. Session Duration

00:00:10



Bounce Rate

86.11%

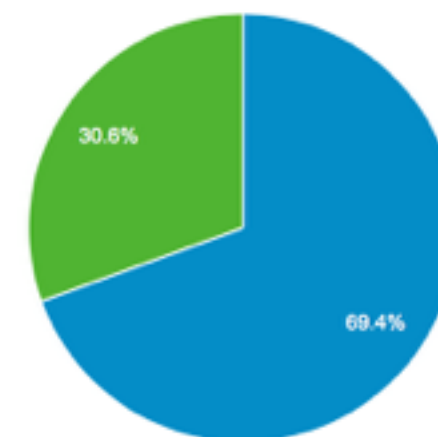


% New Sessions

69.44%



New Visitor Returning Visitor



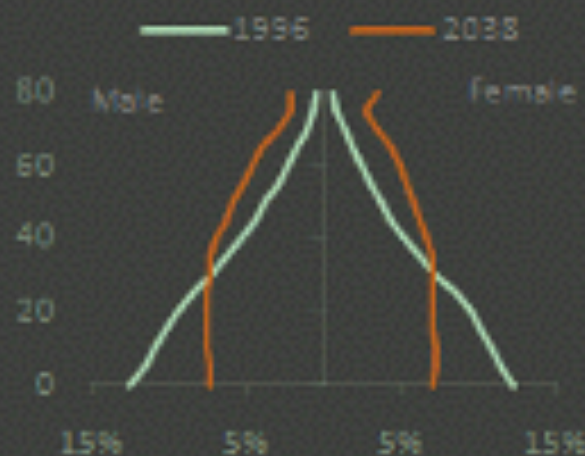
# Population Structure: India



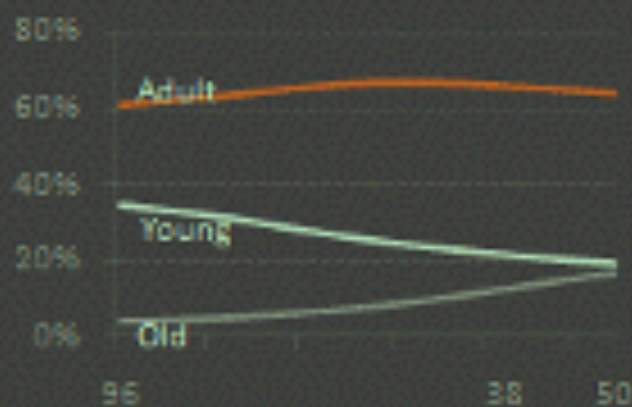
Population 1,555,244,358 Growth 1996-2050 1.70%

Structure		Dependency	
Young	22	Total	52
Adult	66	Young	33
Old	13	Old	19

## Population Pyramid



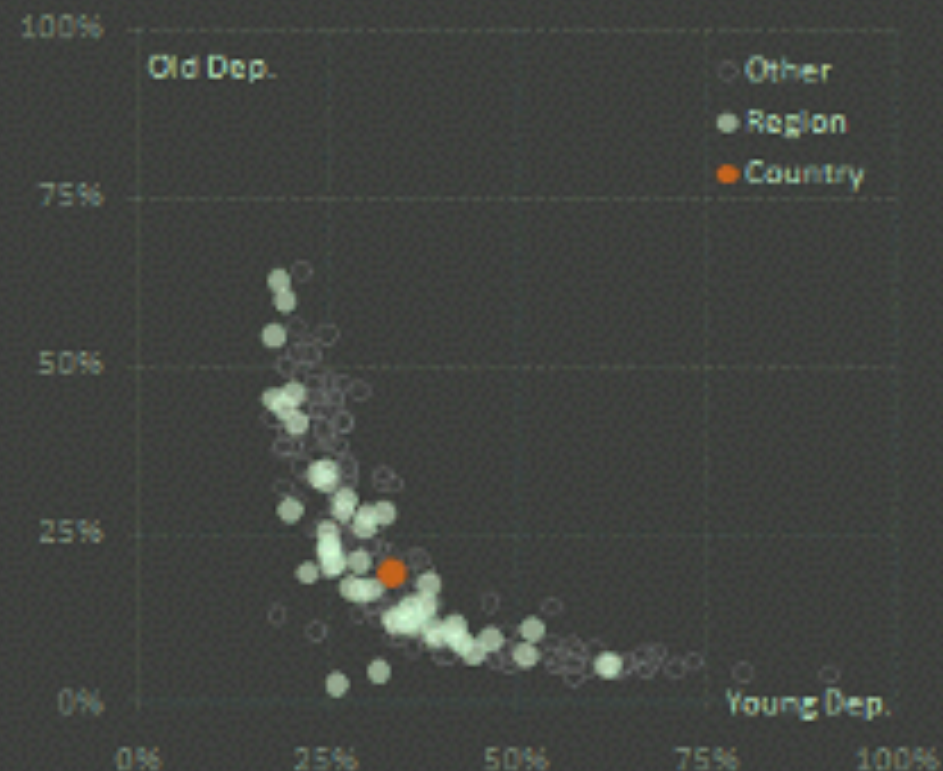
## Measure Age Structure



Country	Population	Growth	Population	Young	Adult	Old
1 India			1,555,244			
2 China			1,457,156			
3 Indonesia			301,846			
4 Pakistan			252,219			
5 Bangladesh			244,422			
6 Philippines			135,501			
7 Japan			105,854			
8 Vietnam			105,767			
9 Turkey			86,113			
10 Iran			80,257			
India			1,555,244			



## Young Dependency vs. Old Dependency

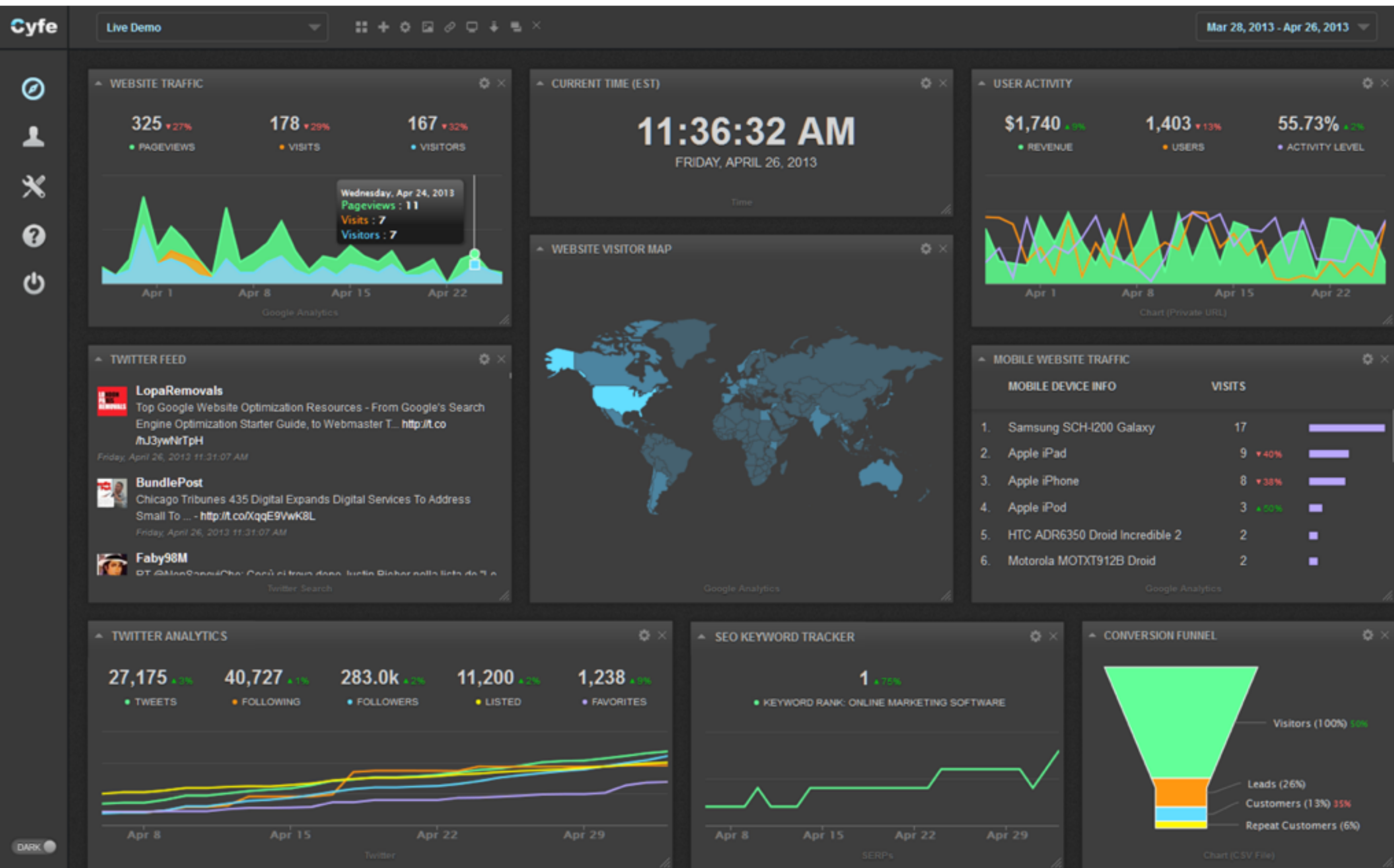


Region  
Continent of Asia

2038

Country  
India







# DATA VISUALIZATION.

## 8 TIPS FOR AN EFFECTIVE DASHBOARD

# 1 2 3 4 5 6 7 8

### LESS IS MORE

The art of omission; highlight what is important, leaving out what isn't.

When designing a dashboard, the old adage, "less is more" still applies. An efficient dashboard allows users to focus on what is really important: numbers, relationships, trends and anomalies. Decorations often make a dashboard less readable and thus less efficient.

In the late 1970s, Edward R. Tufte, famous for his books on data visualization, introduced the term "data-ink". In data-ink you cannot delete anything without inevitably changing the message. "Non-data-ink" is the term he's using for all other, non-essential, information.

His message? Increase the ratio between data-ink and non-data-ink. Highlight what's important, leave out what isn't. This includes for instance unnecessary 3D effects, colour gradients, shadows and other effects that are often purely decorative.

Here is a typical line graph:



And one based on the 'less is more' principles:



Only the important parts of the graph are highlighted and the less important ones, such as grid lines, have a light shade of gray. We believe that the principles of Tufte still have their value in helping us develop efficient dashboards.

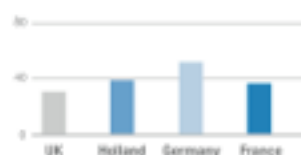
### CHOOSE YOUR COLOURS WITH CARE

Good use of colours can highlight and clarify, while poor use will obscure or conceal information.

How to choose the right colours in a dashboard? Use of colour is often about personal taste, and that cannot be argued.

Or can it? In dashboard design aesthetic aspects also play a role, but it is mainly about how you can best deliver the message.

In a dashboard colour has multiple functions. You can use colours to highlight what is important but also to group what belongs together. There's often an unnecessary use of different colours while it does not have a specific function. The colours add nothing and provide a less clear graph.



By properly choosing the colour, charts will be much easier to read.



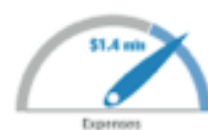
Not everyone sees colours in the same way. Therefore we use special tools to view our designs through the eyes of someone who is partly colour blind. So we know for sure that the dashboard is usable for everyone.

Whatever colours you choose, do it deliberately and apply them consistently.

### NO MORE GAUGES

Although the use of gauges and speedometers in dashboards is quite popular, there are better and more effective visualizations available that also take up less space.

Often the dashboard of a car is used as a metaphor when designing a dashboard to manage an organization. Speedometers, like the one below can often be found in a dashboard.



However, they are not very effective.

One major shortcoming is that they take up a lot of space while they communicate very little information. In this case, only the actual value is being displayed which you could also represent as a single number, possibly supported by a signal color if the value crosses a certain threshold.

Also there is nothing to compare it with, is the current value better or worse than the one from the previous month? That is something we are not able to read from this visualization. Furthermore it is hard to place the value in perspective since there is no scale available.

The following alternative already gives some more historical context since it displays the last 12 months as well.



It becomes immediately clear that the expenses go up and that it is currently outside the ideal bandwidth.

This type of graph also takes up less space making it very well suited for dashboards in which large numbers of values need to be depicted.

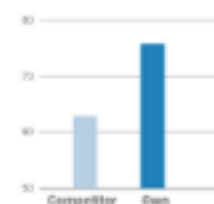
In short, there are often better alternatives available than the familiar gauges and speedometers.

### START AT ZERO

With a bar chart, always allow the vertical axis to start at zero (0) to prevent graphs from being wrongly interpreted.

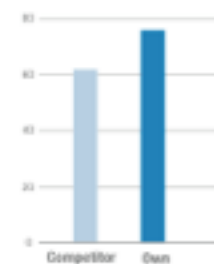
The purpose of a graph is to communicate information fast and accurately means of visualization.

How many times bigger is the number of sold products compared to the ones sold by the competitor?



The number of own products seems to be approximately twice as big. Seems to be. After all, the length of the bar denotes the value and the one for own products is about twice as tall. This graph however gives a distorted or even deceptive representation of the truth since the vertical axis (y-axis) does not start at zero.

If we draw the same graph again but this time with a correct y-axis, the gap between the two bars becomes a lot less dramatic.



An incorrect y-axis can thus result in a misinterpreted picture and erroneous interpretations. To prevent this from happening, the y-axis of a bar chart should always start at zero.

### SHOW THE DIFFERENCE

If you want to compare two series you can also show and highlight the difference.

Often actual values are being compared with budget values. The difference between these two values is important.

Because they are both set up in time it allows you to show the development of the individual values. The differences you need to calculate yourself.



Another approach is focusing on the difference itself.



By highlighting negative values it is immediately clear where results differ from expectations.

This graph can be used both for absolute differences as well as relative percentage differences. The last one for example makes it possible for various KPIs to be compared.

DASHBOARDS PROVIDE INSIGHT INTO THE PERFORMANCE OF ORGANIZATIONS AND CAN THUS IMPROVE THE DECISION-MAKING PROCESS.

A dashboard isn't there just to inform you about the current situation but mainly to answer the question: "What improvements can be made?" A successful dashboard can help you to improve on management and operating profit. But what makes a dashboard successful? Correct and timely figures? Unquestionable! But just having the right figures isn't enough anymore.

A dashboard stands or falls by the degree in which it gives you the required insights. A picture is often worth more than a thousand words. But this also applies to figures and data. By clearly displaying data visually, patterns, trends and exceptions become visual at a glance.

Therefore effective data visualization is critical for the success of a dashboard. But how do you make the right decisions? What works and what doesn't? With some of our best practices an effective data visualization we want to help you with these decisions.

We not only offer a unique experience in dashboard design but we are also the experts in SAP Business Objects BI.

Want to know more? Contact the TIE BEST TEAM.

info@thenextview.nl  
www.thenextview.nl

### HIGHLIGHT WHAT'S (REALLY) IMPORTANT

Keep a dashboard neutral and highlight what is important; like the current position or a different value.

In a dashboard you want the most important information to immediately stand out. An important visual tool here is to provide sufficient contrast.

Do you immediately see the number of 2's in the row?

8545398542  
7543798971  
6198842715  
2275192439

Probably not. And what about now?

8545398542  
7543798971  
6198842715  
2275192439

Therefore we use a neutral dashboard and use highlights to immediately show what is really important.

### YOUR GRAPH FROM ANOTHER ANGLE

A horizontal bar (graph) is often the best choice when long labels are used or when you want to show the hierarchy.

The (graph) are most likely to be displayed vertically but a horizontal orientation also has its advantages. Labels sometimes are displayed vertically if they are too long to be placed next to each other. This does not improve the readability however.

A horizontal orientation has a practical advantage that the category labels can also be placed horizontally and therefore are easier to read. Because you read such a graph top-down this form is very suitable for displaying a hierarchy.



By sorting categories top-down the relationship is immediately clear.

If you want to show a relationship in time always choose an orientation from left to right. This is also the best match with our natural sense of time.



# Erreurs de conception

- .. Variété inutile des types de représentation
- .. Design peu réfléchi et peu esthétique
  - .. Adhérez au «Swiss Design»
- .. Encodage incorrect des données (p.ex. échelle sur histogramme)
- .. Organisation des visualisations non réfléchie

# Erreurs de conception

- .. Problème de mise en évidence: confuse ou absente
- .. Décoration inutile
- .. Maltraitance de la couleur



# Exercice

- .. Réflexion de construction  
d'un tableau de bord

# Tableau de bord interactif

- A travers l'interactivité: possibilité d'exploration de données
- Aide à la décision: permet d'avoir une vue globale sur une situation
- Réactivité importante:
  - $< 0.1$  seconde: réaction instantanée
  - $< 1.0$  seconde: processus de pensée non interrompu mais retard remarqué
  - $< 10$  secondes: limite absolue pour garder l'attention

# Construction de tableaux de bord

- .. Logiciels spécialisés
  - .. Tableau ([www.tableausoftware.com](http://www.tableausoftware.com));  
Tableau Public est gratuit
  - .. ESRI Operations Dashboard for ArcGIS  
(<http://doc.arcgis.com/en/operations-dashboard/>)
  - .. <http://www.datameer.com>
    - > Analyse de données + visualisation



# Construction de tableaux de bord

- .. Méthode D

- .. P.ex. avec SVG, construction de base dans Illustrator possible (Illustrator permet de faire des graphiques)
- .. Libraires Javascript, p.ex. Google Charts, D3 ([d3js.org](http://d3js.org)), Raphaël ([raphaeljs.com](http://dmitrybaranovskiy.github.io/raphael/)), ...

# Exercice

- .. Tutoriel SVG