

# BRIEF INTRODUCTION TO DATA VISUALIZATION

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# Data Visualization

- Data Visualization is used to communicate information clearly and efficiently to users by the usage of information graphics such as tables and charts. It helps users in analyzing a large amount of data in a simpler way. It makes complex data more accessible, understandable, and usable.

# Tips to follow while representing data visually

- Number all diagrams
- Label all diagrams
- Ensure that units of measurement on axes are clearly labelled
- Place any explanatory information in footnotes below the visual
- Check layouts to ensure maximum clarity

# Pro and Cons of Data Visualization

- Pros

- It can be accessed quickly by a wider audience.
- It conveys a lot of information in a small space.
- It makes your report more visually appealing.

- Cons

- It can misrepresent information – if an incorrect visual representation is made.
- It can be distracting – if the visual data is distorted or excessively used.

# DIGITAL STORYTELLING



*The craft  
of using technology  
to tell a story*

# DIGITAL STORYTELLING

- **What is it?**
  - **Use of media**
    - Text, TEXT, Text
    - Visuals
    - Music
    - Video
    - Voice
- **Digital method shares with a wider audience**
- **The storytelling format makes the case**
  - more convincing
  - sway an audience
  - increase donations
  - create a connection to the audience



# The science of storytelling

- The brain on stories
  - (Two parts brain responds 1 wernicke's area- responsible for language comprehension
  - Broca's area- responsible for language processing
  - Human brain responds to agree/disagree

Visualizing



Presenting





# Why Should I Implement Digital Storytelling Into My Course?



## Educational Goals and Objectives

1. Enhance lessons, causing higher order thinking skills
2. Appeals to diverse learning styles
3. Assign research to require a point of view
4. Practice communication skills
5. Entice writing skills
6. Engage students to develop a meaningful voice
7. Encourage technology skills

# Start a Digital Story



- Look at the assignment
- Ask “What do I want to tell?” use **text**
- Ask “What emotion do I want to convey?”
- Gather the **images** to bring the story to life
- Gather the **sound** to bring the images to life
- Use **voice**, background soundtrack
- Spend time **assembling the story**

# Types of Digital Stories

## 1. Personal Narratives

- Character stories
- Memorial stories
- Stories about events or places in our lives
- Stories about what we do
- Recovery & discovery stories
- Love Stories



### Digital Personal Narrative – Reading

<http://www.youtube.com/watch?v=AjrNm5h7gzE>

## 2. Examination of Historical Themes and Events

- Explore and depict a historical theme or event.
- Require students to research a topic
- Use informational & media literacy skills

## 3. Stories that Inform or Instruct

- Curriculum content which delivers information
- Motivational/Inspirational
- Testimonial

# Samples using PPT and Animoto

## Digital Storytelling Videos made with PPT

- Starfish an inspirational message for all teachers
- Digital Storytelling: Social Studies 7<sup>th</sup> Grade
- George Washington Carver Biography Project
- Angry Birds Movie Made with PowerPoint 2010
- Teacher Quotes
- The Story of an Hour
- Tribute to Those Who Wear Blue

## Digital Storytelling Videos made with Animoto

- Historic Philadelphia - <http://animoto.com/play/94lBy69UEgb55O0kcAl5cA>
- How to Make Dessert! <http://animoto.com/play/tf93r1paJ1OmOSndUuNd1A>
- Caterpillar Into Butterfly - <http://animoto.com/play/jC9BuxwEbmVBzlpLL0Rcw>
- Inspirational - <http://animoto.com/play/xmc7lLcQdSZhxpqnQRq5HA>
- Life Cycle of a Plant - <http://animoto.com/play/78J9UgJ82fG0PLdBvAhU1Q>
- Ellis Island - <http://animoto.com/play/mfjYuuFBBz6NyRvsbBW2ww>

# Gathering Media: Images

Here are some sources of copyright-free images:

- [Flickr](#) from Creative Commons is a free resource of non-copyrighted images.
- [Creative Commons Search](#)
- [Pics4learning.com](#)
- [Public Domain, Copyright Free, Open Source, and Student Use Images and Media](#)
- [Copyright Free and Public Domain Media Sources](#)
- [Presentations ETC](#) (includes copyright-free audio)
- [Public Domain Art, Books, Images, and Links](#)
- [Copyright-Friendly Images](#)

# Adding Audio – most easily used audio file type in projects is an .MP3



- **Tool to Record a Voice File**

- Audacity <http://audacity.sourceforge.net/download/>
- Lame to export files as MP3  
<http://audacity.sourceforge.net/help/faq?s=install&item=lame-mp3>
- PC Sound Recorder
- Vocaroo.com
- Record narrations or audio right in PowerPoint

- **Add Music**

- Royalty and copyright free audio files found on the web
  - <http://freeplaymusic.com/>
  - <http://incompetech.com/m/c/royalty-free/>
  - [http://www.thefreesite.com/Free\\_Sounds/Free WAVs/](http://www.thefreesite.com/Free_Sounds/Free_WAVs/)

# Digital Storytelling Applications

## Mac and PC

### 1. PC Programs

- Microsoft Photo Story 3 (still images)
- Windows Movie Maker (still images and/or video clips)
- **PowerPoint**
- **Web Tools - Animoto**

### 2. Mac Programs

- iPhoto (still photos and music)
- Apple iMovie (still images and/or video clips)
- **PowerPoint**
- **Web Tools - Animoto**

# REVIEW – WHAT MAKES A GOOD DIGITAL STORY?

## SEVEN ELEMENTS OF EFFECTIVE DIGITAL STORYTELLING

1. A point of view
2. A dramatic question
3. Emotional content
4. Economy
5. Pacing
6. The gift of your voice
7. An accompanying soundtrack



(The Connected Classroom, Learning & Leading with Technology Volume 32 )



# Digital Storytelling

**COLLECT YOUR PHOTOS NOW!**

- Develop a sample digital story for your course.
- OR design a digital assignment for your students.



# How do I get started storytelling with data?

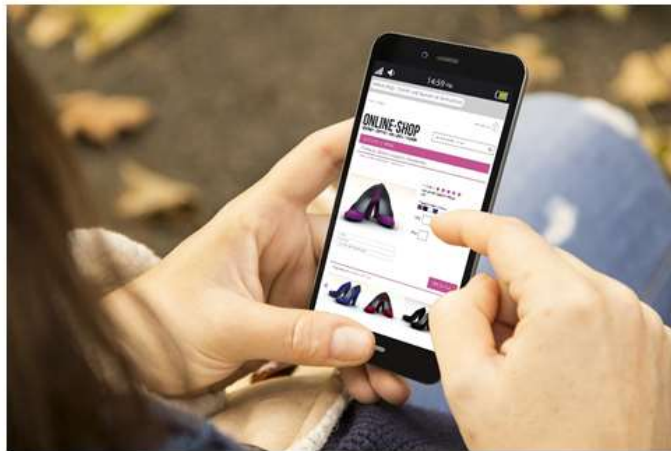
- A good data storyteller always begins with their audience and establishes their key message:
- What am I trying to achieve with the data I choose to display?
- Who is my audience? What do they care about? What level of data detail will they likely expect or appreciate?
- What is my BIG Idea -- the one thing I want my audience to know or do with my data?

- Storytellers also determine: 'Is the data I am choosing moving forward the story I want to tell?' If the answer is yes, it is probably safe to include it. At that point, you are ready to open your computer and begin to build your visuals.

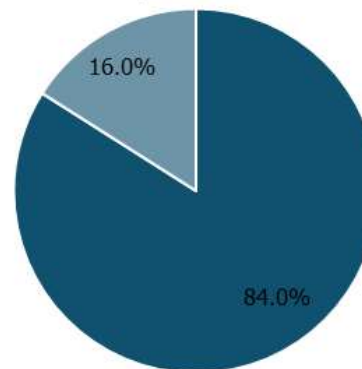
# Create a Headline for Every Slide

BEFORE

## Mobile trends in shopping

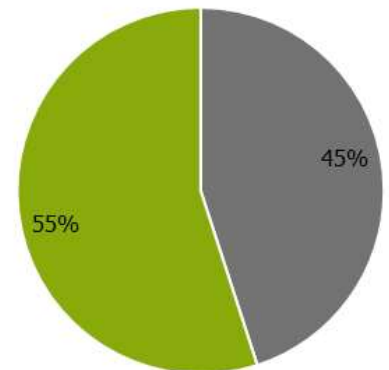


Smartphone owners



- Shop on smartphone
- Do not shop on smartphone

Online sales

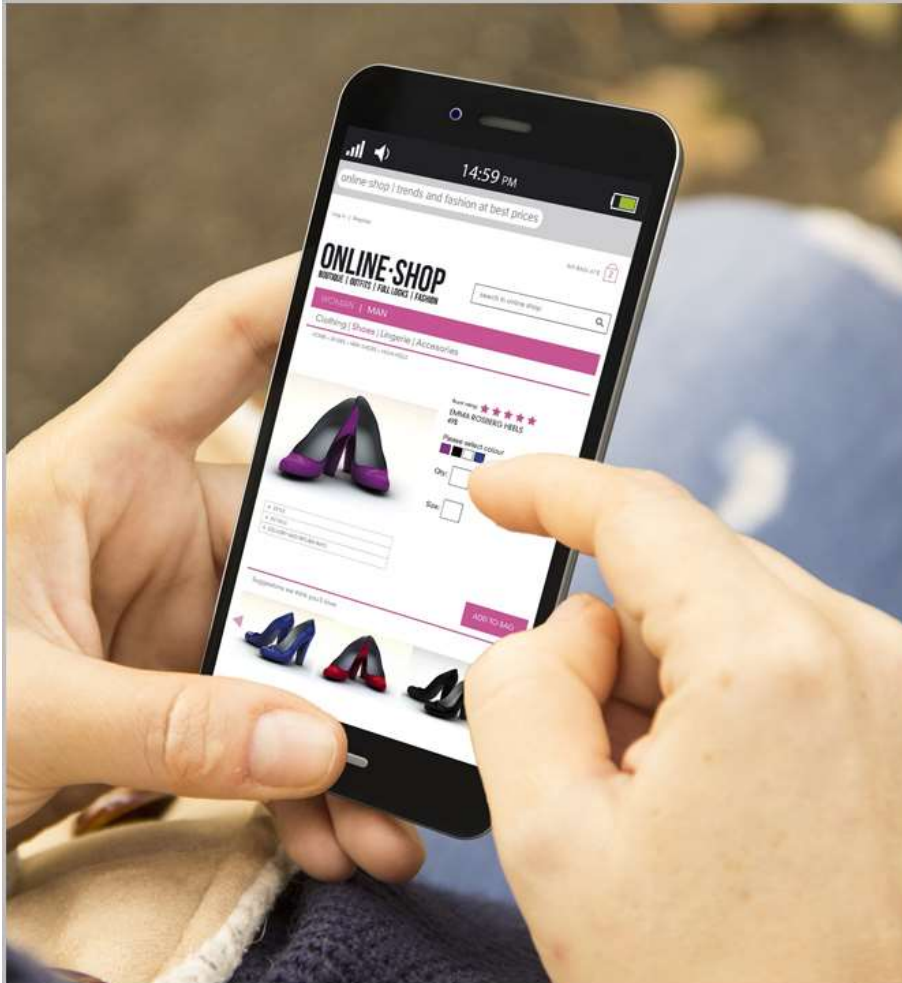


- Online sales - Smartphone
- Online sales - All other

# Mobile is changing the way people shop and buy

84% of smartphone users shop on their phones

45% of all online shopping purchases happen on a smartphone



# Consider photography

BEFORE

## Millennials are mobile

- Young adults, 18 to 24, send 2,022 texts per month on average — 67 texts on a daily basis
- Millennials are not using traditional computing devices, 58% only access social media on their smartphones
- Millennials complete many practical activities on their smartphones – 71% of millennials report reading news on their smartphones





## Your new consumers are mobile natives



**58%**

of millennials access  
social media on mobile only



**2K/mo**

average number of texts  
sent by 18- to 24-year-olds



**71%**

of millennials read news  
via smartphone

Source: Facebook

# Don't supply any extraneous data

BEFORE

	A	B	C	D	E	F	G	
1	Population (thousands)							
2	City	Country	2015	2020	2025	2050	2015-2050 Growth	
3	Tokyo	Japan	36,090	36,370	36,400	36,400	0.9%	
4	Mumbai	India	20,070	21,950	24,050	26,385	31.5%	
5	Delhi	India	17,020	18,670	20,480	22,498	32.2%	
6	Dhaka	Bangladesh	14,800	17,020	19,420	22,015	48.8%	
7	São Paulo	Brasil	19,580	20,540	21,120	21,428	9.4%	
8	Ciudad de México	México	19,480	20,190	20,700	21,009	7.8%	
9	New York-Newark	US	19,440	19,970	20,370	20,628	6.1%	
10	Kolkata	India	15,580	17,040	18,710	20,560	32.0%	
11	Shanghai	China	15,790	17,210	18,470	19,412	22.9%	
12	Karachi	Pakistan	13,050	14,860	16,920	19,095	46.3%	
13	Kinshasa	D.R. Congo	9,050	11,310	13,880	16,762	85.2%	
14	Lagos	Nigeria	10,570	12,400	14,130	15,796	49.4%	
15	Total top 12		210,520	227,530	244,650	261,988	24.4%	
16	Source: Nordpil World Database of Large Cities, 2016							

AFTER

# The world rapidly urbanizes

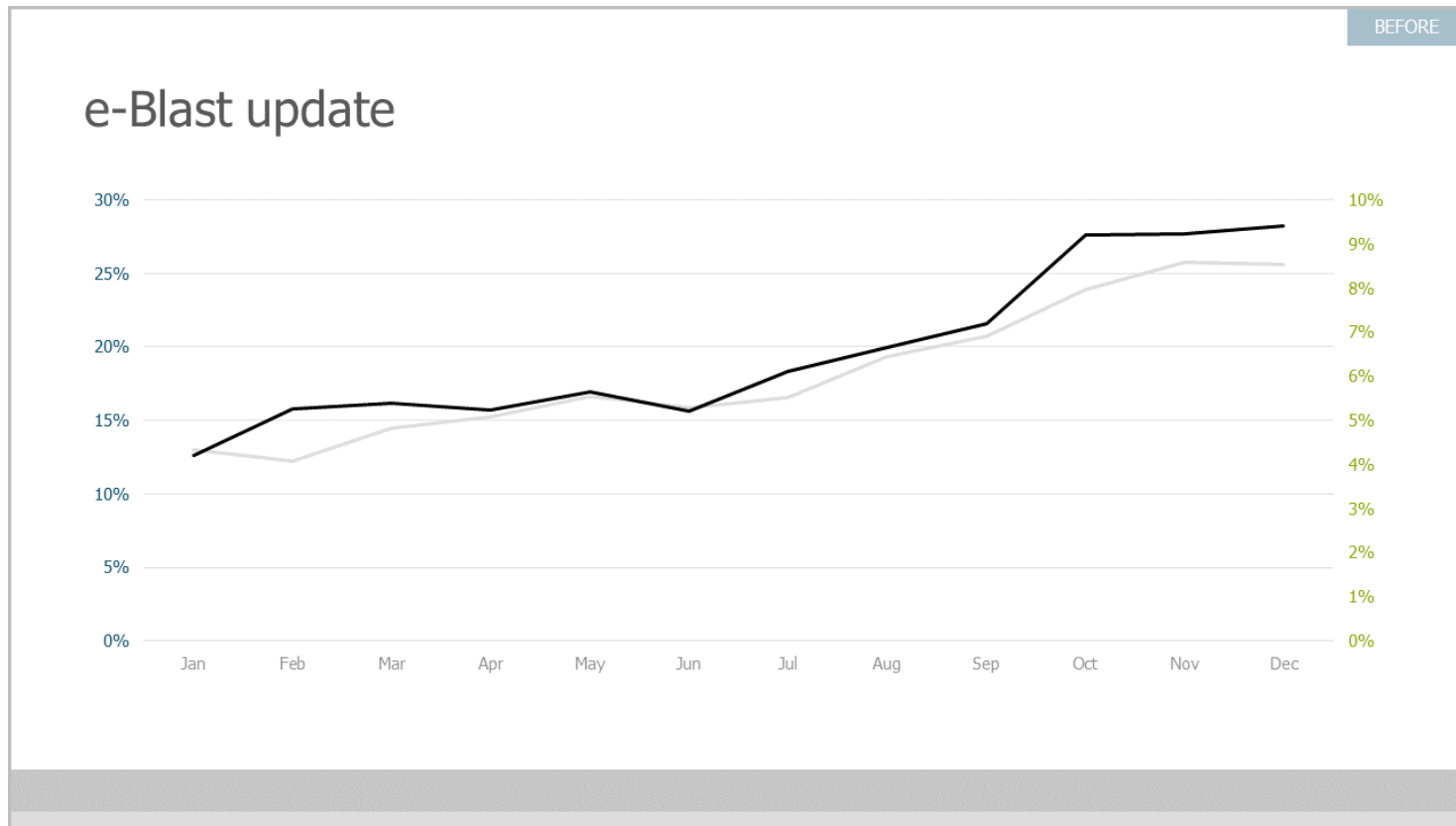
BY 2050,  
TOP 12  
METROS ADD

51M  
PEOPLE

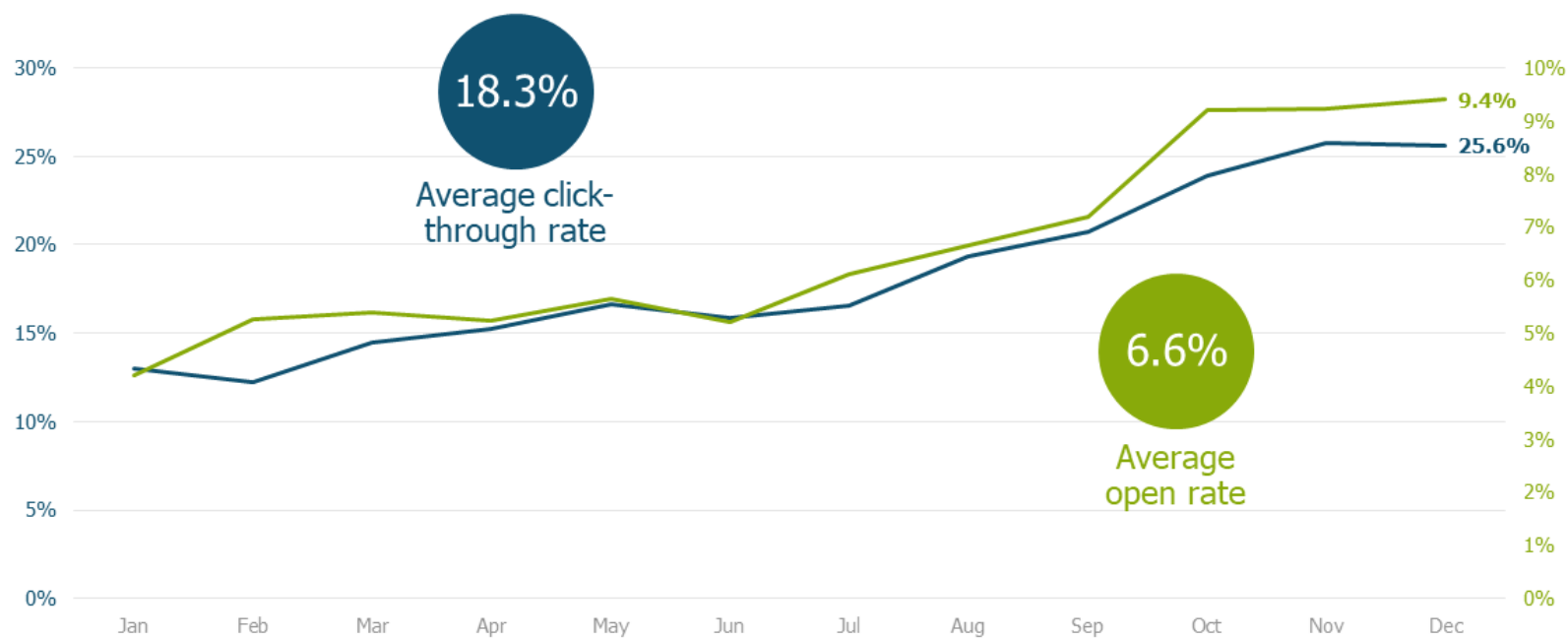




# Use call-outs to highlight important data



## e-Blast investment delivers results



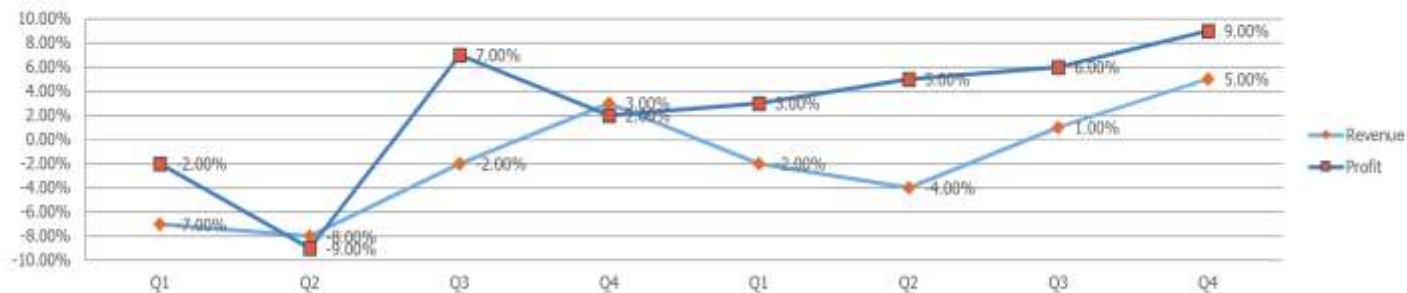
# Don't use a chart if you don't need one

BEFORE

## Quarterly business review

### Results

- Revenue 5% above target
- Profit 9% above target
- Profit and revenue performance driven by growth in the direct channel
- EMEA profits (-4% v target/-2%YoY) trend needs to be monitored





AFTER

## Q4 delivers excellent financial results, Forecast suggests challenges ahead

Revenue and profits exceed target

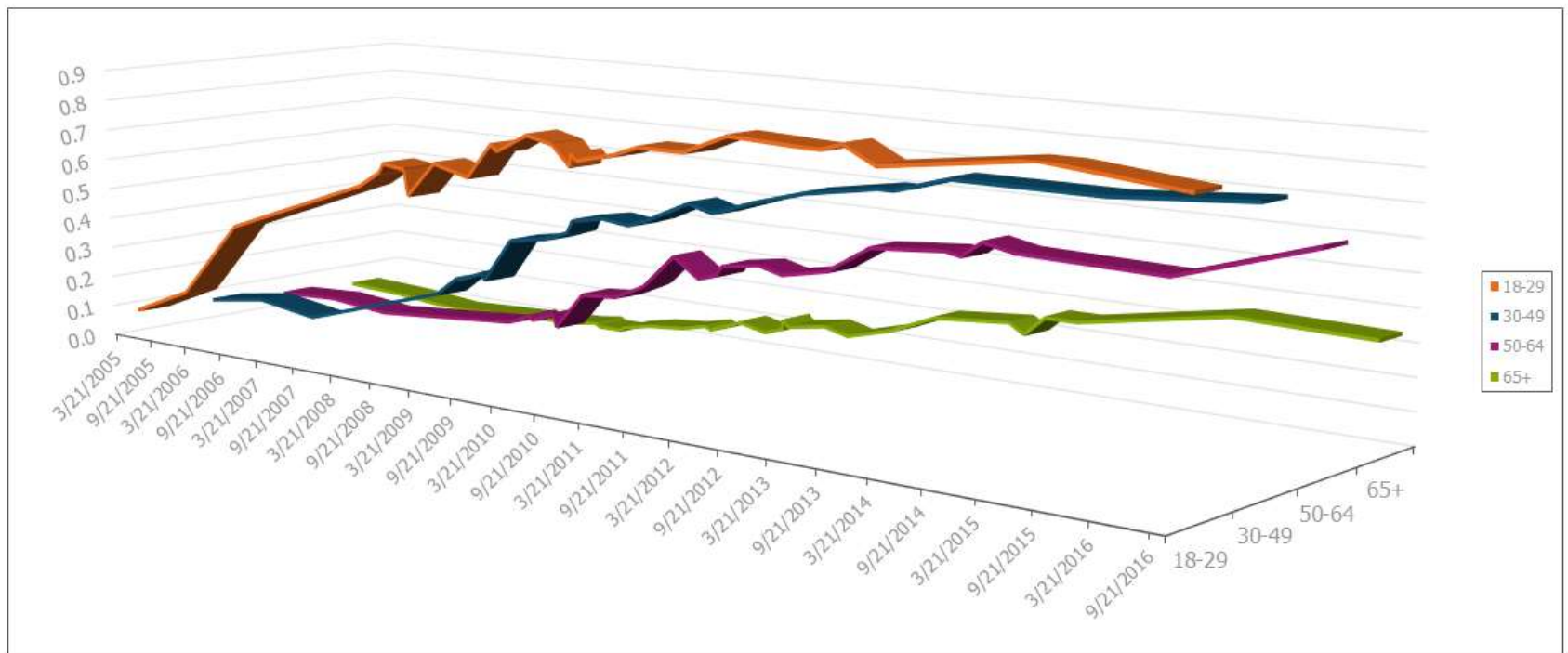
Economic indicators lag in 3 of 4 regions

Mixed performance on IT initiatives

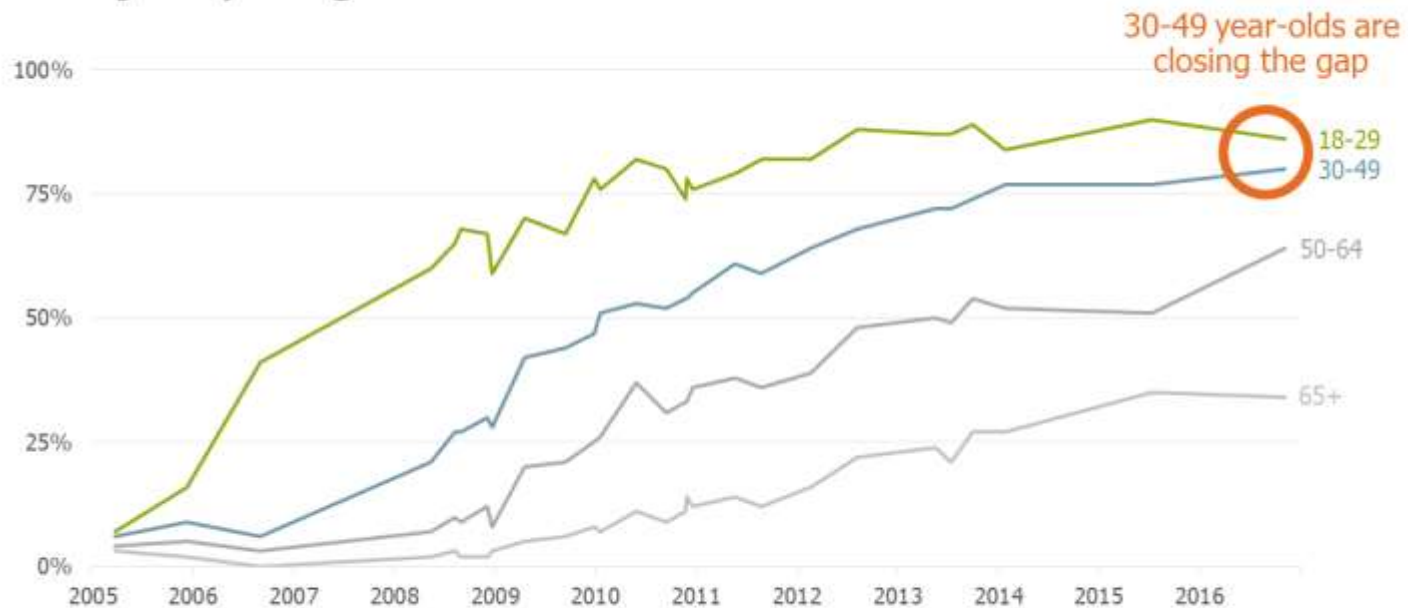
# Minimize the Noise

BEFORE

## Social media use by age



## Social media use now popular with more than just young adults



Source: Pew Research Center, US data

# Why Tableau?

- Why use Tableau software when there are a whole lot of tools available to perform data visualization?
- Analyzed very quickly
- Visualizations are generated as dashboards and worksheets.
- Tableau allows one to create dashboards that provide actionable insights and drives the business forward.
- Tableau products always operate in virtualized environments when they are configured with the proper underlying operating system and hardware.
- Tableau is used to explore data with limitless visual analytics.

# Features of Tableau

- Real-time analysis
- Data blending
- Collaboration of data
- Allowing to work on without technical knowledge



# How does Tableau work?

- The major work of Tableau software is to connect and extract the data stored in various places.
- It can pull data from any platform.
- Tableau can extract data from any database, be it Excel, PDF, Oracle, or even Amazon Web Services.
- Once Tableau is launched, ready data connectors are available which allow you to connect to any database.
-

- The data extracted can be connected live to the Tableau data engine, Tableau Desktop.
- Data Analyst or a Data Engineer work with the data that was pulled up and develop visualization.
- The created dashboards are shared with users in the form of static files.
- The users receiving dashboards view the files using Tableau Reader.
-

- The data extracted from Tableau Desktop can be published to Tableau Server, which is an enterprise platform where collaboration, distribution, governance, security model, and automation features are supported. Using Tableau Server, end users can access the files from all locations, be it a desktop or a `mobile phone.



Tableau	MS Excel
<p>Tableau is basically a data visualization tool which provides pictorial and graphical representations of data.</p>	<p>Excel is basically a spreadsheet for working with data in rows and columns. You need to first represent your data into a tabular format and then you can apply visualizations on top of it.</p>
<p>In Tableau, you can gain insights that you never thought possible. You can play with interactive visualizations, deploy data drilling tools, and explore various data that is available, and you don't need to have any specific knowledge of the insight you are looking for.</p>	<p>When it comes to Excel, you need to have a prior knowledge of the insight that you want and then work with various formulae in order to get there, along with that tabulation is also needed.</p>
<p>With Tableau, it is all about an easy and interactive approach.</p>	<p>In Excel, you need to have some programming in order to come up with real-time data visualization.</p>

# Advantages of Using Tableau

- **Fantastic Visualizations**

- You can now work with a lot of data that doesn't have any order to it and create a range of visualizations. Well, thanks to the in-built features of Tableau which help you create visualizations that surely stand out of the crowd. You also have the option of switching between different visualizations to bring about a greater context, ways of drilling down data, and exploring the data at a minute level.

- **In-depth Insights**

- Tableau can help enterprises futuristically to analyze data without any specific goals in mind. You can explore visualizations and have a look at the same data from different angles. You can frame 'what if' queries and work with data by hypothetically visualizing it in a different manner and dynamically adding components for comparison and analysis. When you are working with real-time data, then these capabilities are highlighted in a huge manner.

- **User-friendly Approach**

- This is the greatest strength of Tableau. It is built from the ground level for people who don't have any technical skills or coding experience. So, everything can be done with this tool by anybody without any prior set of skills. Since most of the features are in a drag-and-drop format, each visualization is so intuitive and self-depicting.

- **Working with Disparate Data Sources**

- Tableau has a powerful reason to be included by various organizations in today's data-driven world where data can come from any point and any disparate sources. Tableau has an edge over other Business Intelligence and Analytics tools as it lets you work by connecting to various data sources, data warehouses, and files which exist in the cloud, big data that exists in spreadsheets, and non-relational data, among other types of data. Tableau effortlessly blends all different types of data to help organizations come up with compelling visualizations.

- **Adding Datasets**

- Be it a database or an Excel workbook, with Tableau one can easily add new datasets which get automatically blended with Tableau using common fields.

- **Switching Between Visualizations**

- You also have the option of switching between different visualizations to bring about a greater context, with ways of drilling down data and exploring it at a minute level.
- Tableau is one of the top Business Intelligence and Data Visualization tools available today. It is being used by most of the Fortune Global 500 list of companies in order to derive valuable insights from their data.
- Prepare yourself for the Top [Tableau Interview Questions And Answers.](#)
- The best part of Tableau is that there is no requirement of any technical knowledge or programming skills for working with it. Most of its features are self-explanatory and it has provides a drag-and-drop feature.
- For businesses on the constant lookout for more valuable insights to grow, a tool like Tableau becomes more indispensable, regardless of the industry vertical and customer segmentation.

User-friendly

1

10

Seamless data connectivity

Intuitive storytelling

2

9

Interactive dashboard reporting

Follows any data structure

3

8

Free of IT dependency

Interactive data visualization

4

7

Publishing online/offline

One view for multiple data

5

6

Strong security protocols

