



# The Zen of **Visual Analysis** in a **Big Data** World

**Mrunal Shridhar**

Senior Product Consultant, EMEA

big data  
Search term

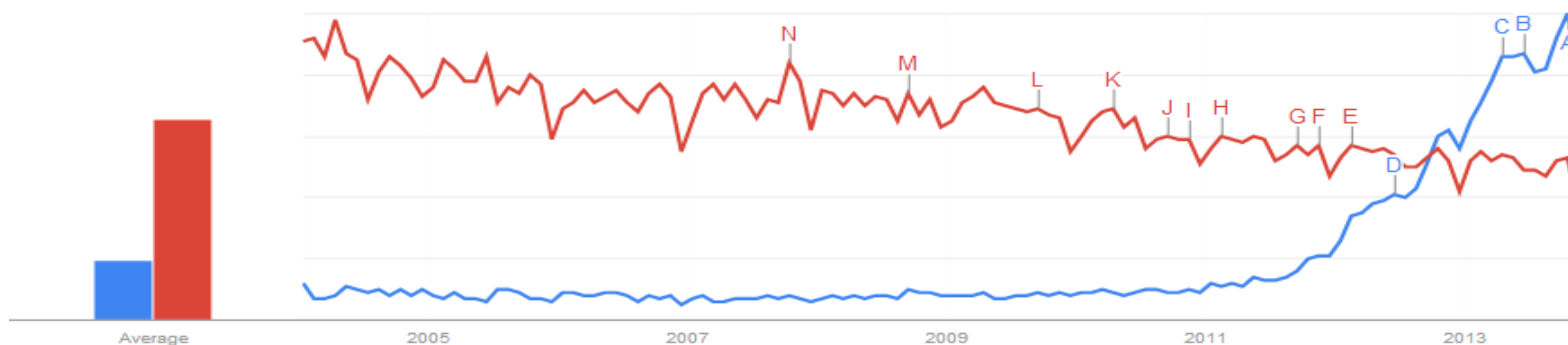
business intelligence  
Search term

+ Add term

Interest over time ?

☒ News headlines

☐ Forecast ?



Embed

Regional interest ?

big data

business intellig...

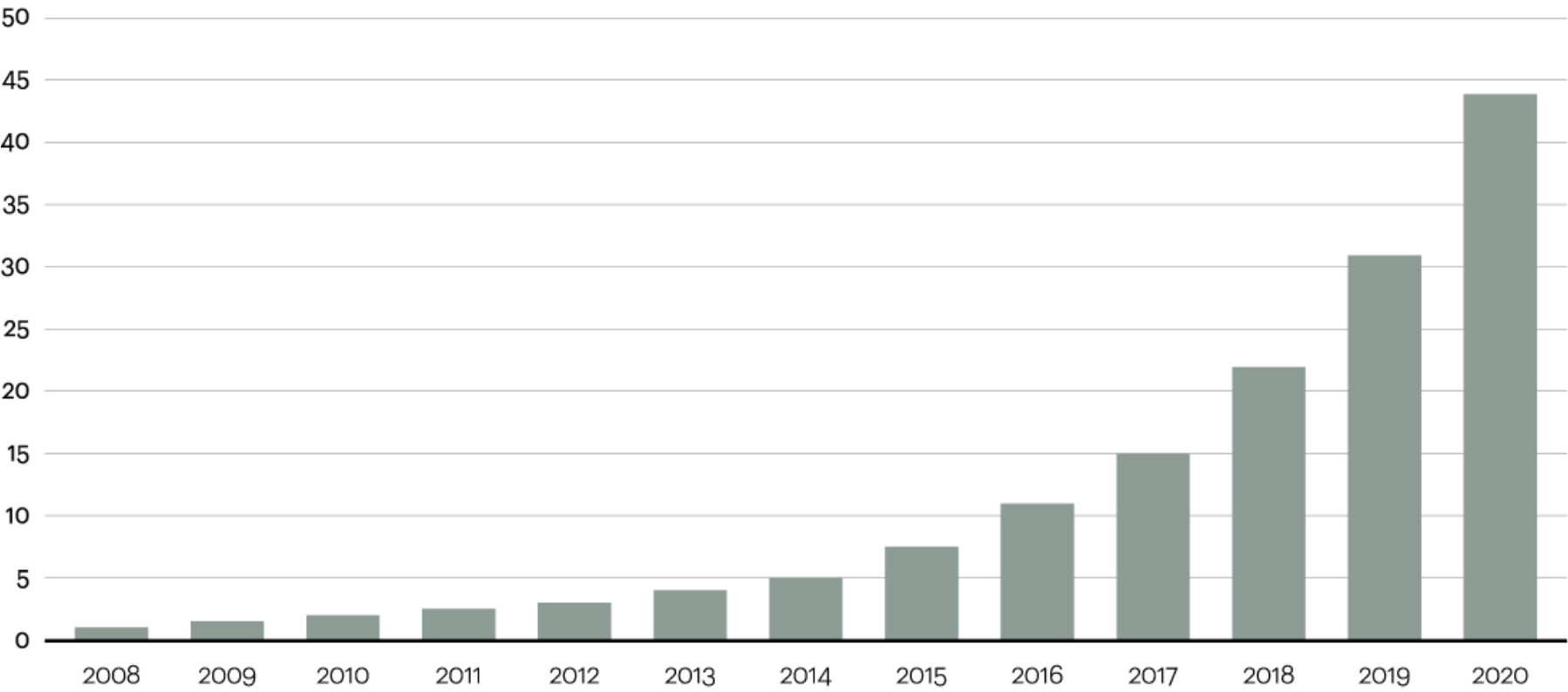
Region | City



India	100	<div><div></div></div>
South Korea	64	<div><div></div></div>
Singapore	60	<div><div></div></div>
Hong Kong	40	<div><div></div></div>
United States	39	<div><div></div></div>
Taiwan	38	<div><div></div></div>
South Africa	31	<div><div></div></div>

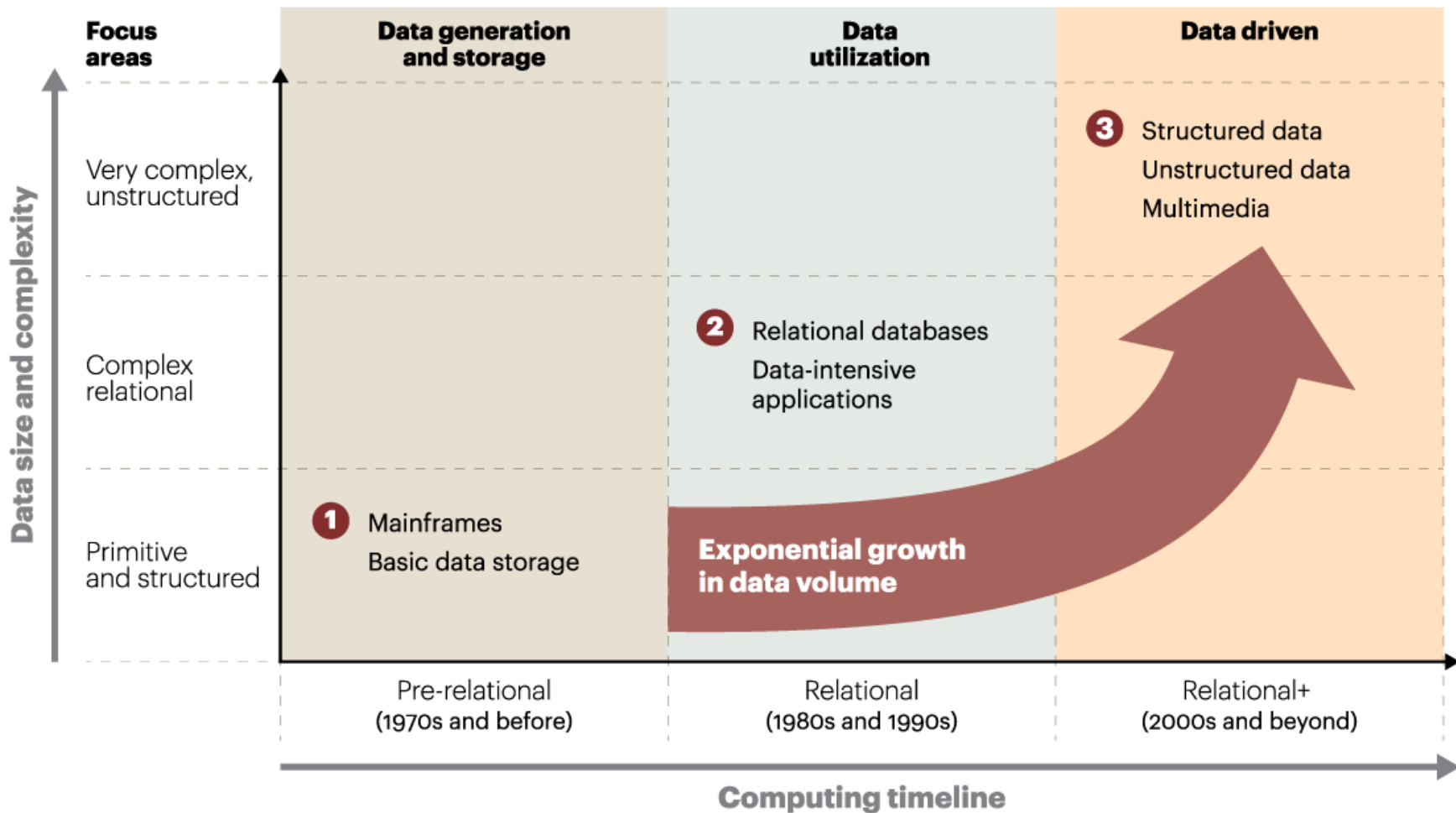
**Data is growing at a 40 percent compound annual rate, reaching nearly 45 ZB by 2020**

**Data in zettabytes (ZB)**



Source: Oracle, 2012

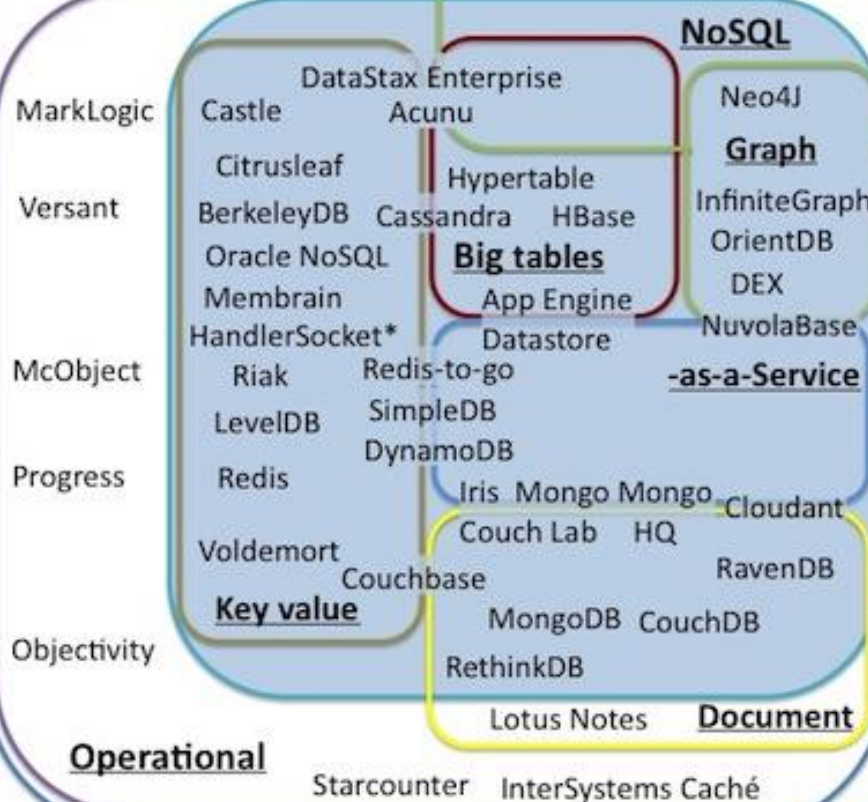
## The evolution of big data



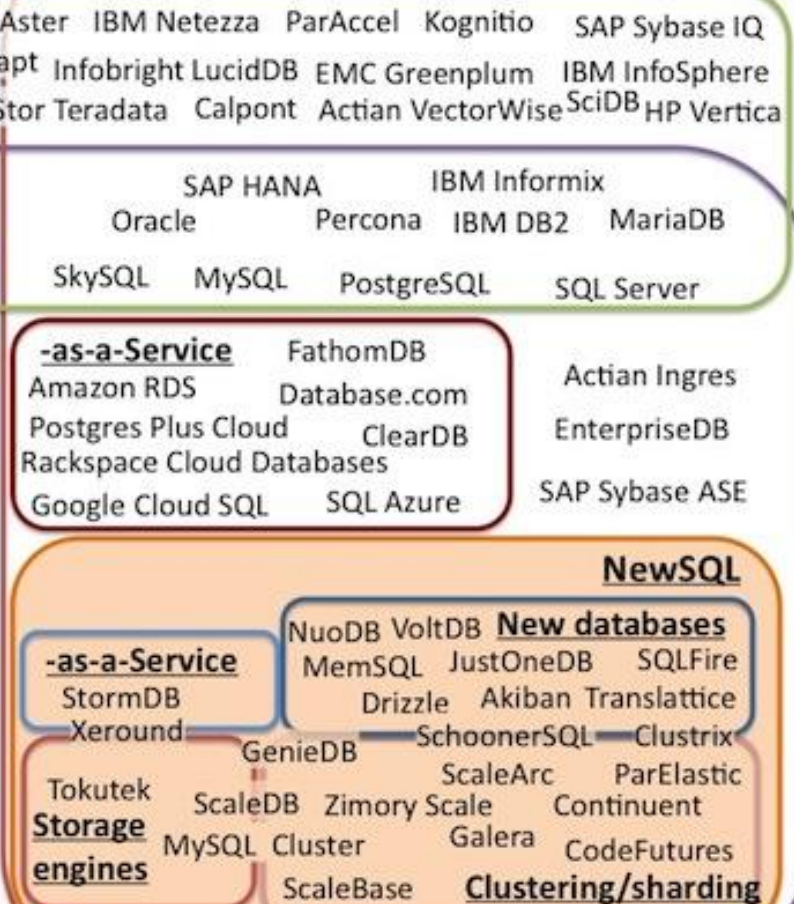
# The evolving database landscape

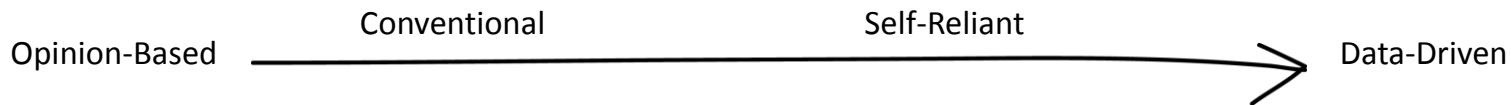
451 Research

## Non-relational

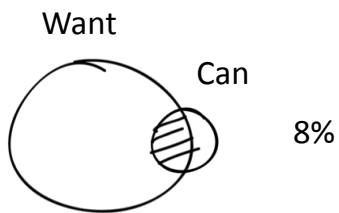


## Relational

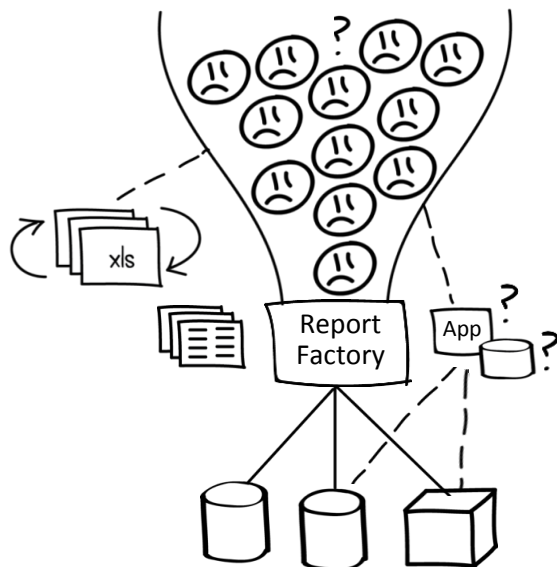
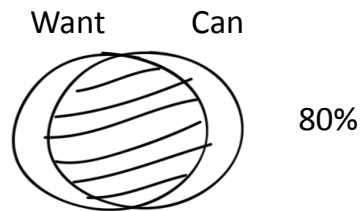




- Lost time and speed
- Costly decisions
- Lost talent



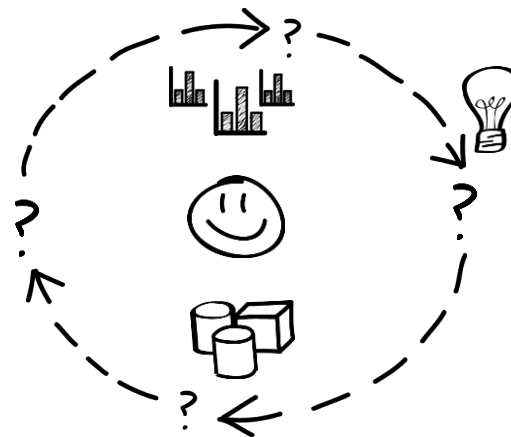
People



Speed to Opinion  
(Weeks/Months)

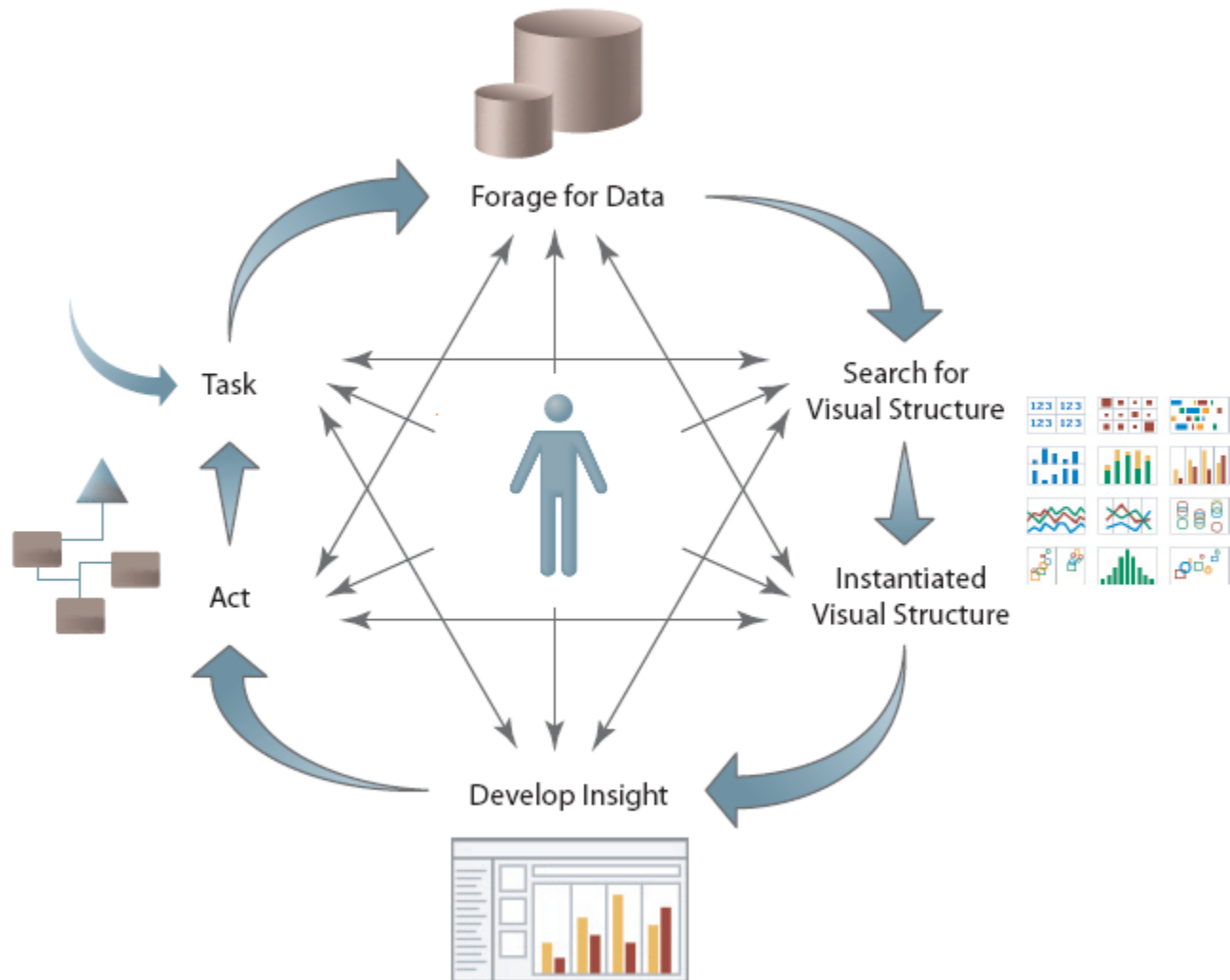
Experience

Time



Speed to Insight  
(Seconds/Minutes)

# The Cycle of Visual Analysis



# The human visual system is powerful

How many 9s?

3 3 0 3 0 1 8 7 6 8 2 1 4 0 3 8 3 7 7 2 0 5 2 3 2 7 0 2 0  
7 1 4 6 0 2 1 3 2 7 6 0 2 5 6 3 2 5 7 6 3 3 0 2 0 3 0 7 2  
8 7 5 7 2 8 3 8 7 7 8 2 0 7 7 5 2 3 1 1 5 6 3 8 4 7 8 2 0  
0 5 0 5 1 6 1 7 5 6 8 0 4 4 6 7 4 7 1 4 0 0 8 4 4 3 0 3 2  
2 4 3 1 3 5 4 9 5 0 7 6 0 7 4 3 1 8 2 7 3 4 6 0 2 4 8 2 3  
8 6 2 2 6 5 4 6 7 0 7 6 0 0 3 9 0 2 4 7 1 7 2 3 3 5 8 7 0  
0 8 4 5 1 3 1 7 6 4 5 4 1 2 4 5 3 3 5 4 9 6 7 7 6 3 4 2 5  
4 7 7 0 2 2 0 1 1 7 7 7 0 2 6 6 4 7 5 8 6 1 4 3 7 8 5 4 6  
4 3 6 6 4 6 6 2 8 4 8 5 3 7 8 8 1 3 8 5 4 5 7 4 0 3 2 8 4  
5 5 0 3 5 3 5 3 8 3 2 3 8 2 3 1 6 2 7 2 4 6 3 6 4 4 3 2 5  
4 4 0 2 1 7 2 4 4 7 4 1 9 2 4 5 2 5 0 4 0 0 5 3 6 3 3 6 7  
7 4 6 6 8 7 5 7 9 2 0 2 8 8 8 8 3 2 4 2 6 4 0 4 6 3 7 2 1  
0 1 7 1 5 9 1 4 2 8 7 3 7 1 4 5 1 8 7 8 0 5 1 7 0 5 8 8 1  
2 8 5 2 1 2 8 7 7 6 2 5 6 2 6 4 1 5 1 6 1 2 1 1 0 5 6 4 0  
2 1 1 7 7 2 0 0 1 8 7 0 2 9 0 2 8 5 7 8 4 6 0 6 5 0 7 1 2  
0 5 2 4 1 5 3 3 1 5 5 1 4 0 1 6 4 3 3 9 8 8 3 4 6 8 4 8 6  
7 3 7 5 2 4 0 2 7 6 3 8 5 5 4 5 8 8 7 5 5 6 5 6 7 9 7 7 4  
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4 4 8 3 3 3 5 0 1 0 3 8 6 3 2 0 5 0 6 1 3 3 4 3 6 1 5 8 6  
1 0 2 2 7 6 3 3 0 8 8 0 3 1 8 8 1 2 1 7 5 2 9 3 5 8 3 2 5



# The human visual system is powerful

3	3	0	3	0	1	8	7	6	8	2	1	4	0	3	8	3	7	7	2	0	5	2	3	2	7	0	2	0
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8	6	2	2	6	5	4	6	7	0	7	6	0	0	3	9	0	2	4	7	1	7	2	3	3	5	8	7	0
0	8	4	5	1	3	1	7	6	4	5	4	1	2	4	5	3	3	5	4	9	6	7	7	6	3	4	2	5
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0	5	2	4	1	5	3	3	1	5	5	1	4	0	1	6	4	3	3	9	8	8	3	4	6	8	4	8	6
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1	0	2	2	7	6	3	3	0	8	8	0	3	1	8	8	1	2	1	7	5	2	9	3	5	8	3	2	5

# Accountants exploit pop-out

		Market							
Product Type	Product	Central		East		South		West	
		Profit	Sales	Profit	Sales	Profit	Sales	Profit	Sales
Coffee	Amaretto	\$5,104	\$14,012	\$1,010	\$2,994			(\$1,224)	\$9,263
	Colombian	\$8,525	\$28,911	\$27,256	\$47,385	\$8,767	\$21,663	\$11,256	\$30,352
	Decaf Irish Cream	\$9,635	\$26,157	\$2,726	\$6,262	\$2,935	\$11,596	(\$1,307)	\$18,233
Espresso	Caffe Latte					\$3,873	\$15,443	\$7,502	\$20,456
	Caffe Mocha	\$14,642	\$35,218	(\$6,232)	\$16,646	\$5,202	\$14,166	\$4,066	\$18,874
	Decaf Espresso	\$8,859	\$24,483	\$2,411	\$7,720	\$5,930	\$15,381	\$12,302	\$30,578
	Regular Espresso			\$10,065	\$24,031				
Herbal Tea	Chamomile	\$14,435	\$36,571	\$764	\$2,193	\$3,178	\$11,183	\$8,854	\$25,631
	Lemon	\$6,253	\$21,982	\$7,902	\$27,177	\$2,593	\$14,494	\$13,121	\$32,273
	Mint	\$4,069	\$9,335	(\$2,243)	\$11,991			\$4,328	\$14,384
Tea	Darjeeling	\$10,769	\$30,284	\$6,500	\$14,094			\$11,784	\$28,773
	Earl Grey	\$10,334	\$32,883	\$3,404	\$6,507			\$10,426	\$27,382
	Green Tea	\$1,227	\$5,209	\$5,654	\$11,576			(\$7,112)	\$16,065

# The human visual system is powerful



# Demo

advice:

Iterate, explore, and  
experiment

...regardless of task



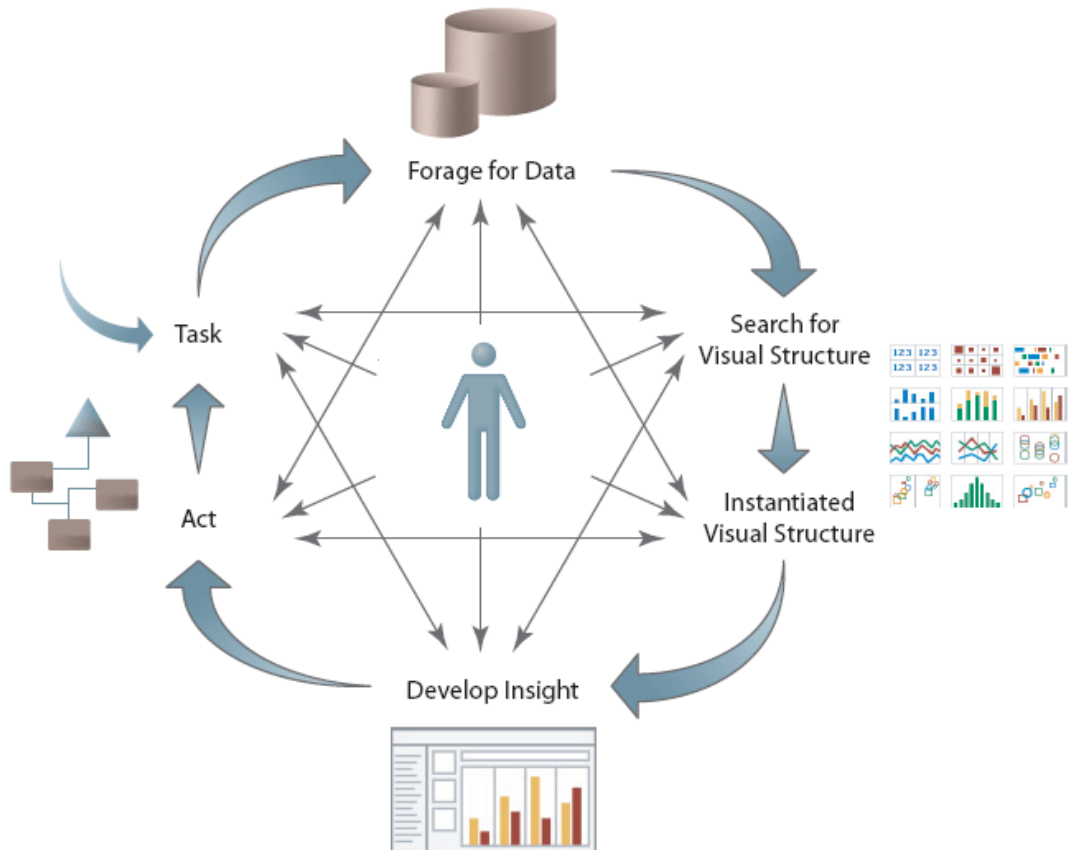
How do we **empower** individuals and groups to  
effectively **analyze and share data?**



## A close-up photograph of a human eye. The iris is a vibrant blue with a complex, fibrous texture. The pupil is dark and centrally located. The sclera (white part of the eye) is visible around the iris. The eyelids are closed, and the eyelashes are dark and well-defined. The skin around the eye is light-colored and shows some fine lines.

- 
- The screenshot shows the Tableau Desktop interface with a trellis chart. The Columns shelf contains 'Product Type' and 'Product'. The Rows shelf contains 'Market' and 'SUM(Sales)'. The Marks card is set to 'Automatic' with 'SUM(Profit)' as the color. The view is a trellis chart with three rows (Central, South, West) and four columns (Market, Coffee, Espresso, Tea). A red arrow points from the 'SUM(Profit)' field in the Marks card to the 'Profit' dimension in the Columns shelf.

**Incremental**  
**Expressive**  
**Unified**  
**Direct**

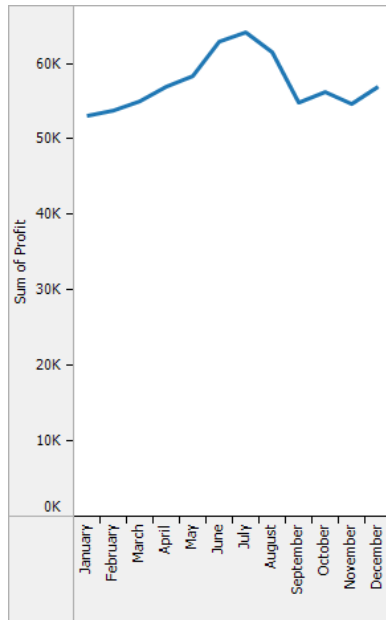




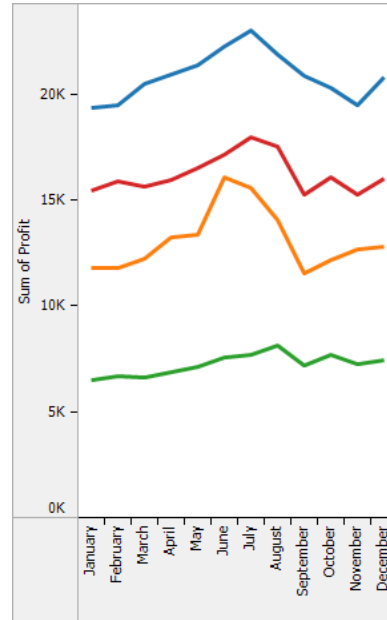
Supporting the “Cycle of Visual Analysis”:

## Incremental

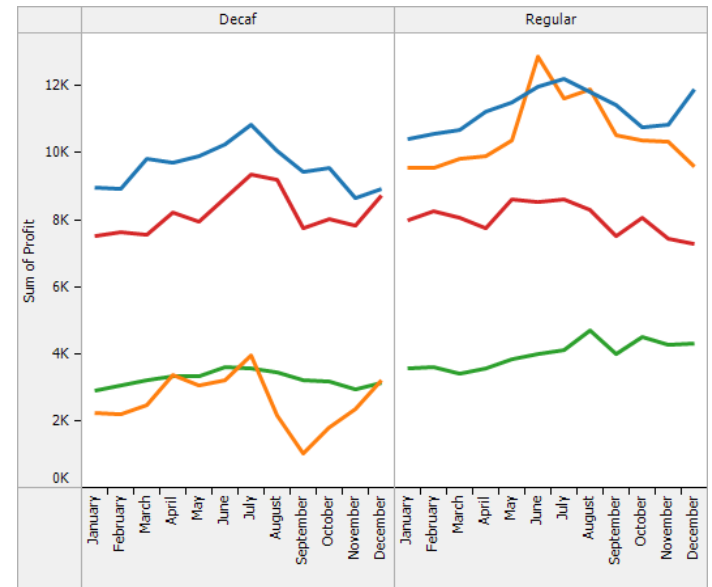
Allow people to easily and incrementally  
**change the data** and  
**how they are looking at it**



click



click



advice:

Start **simple**...



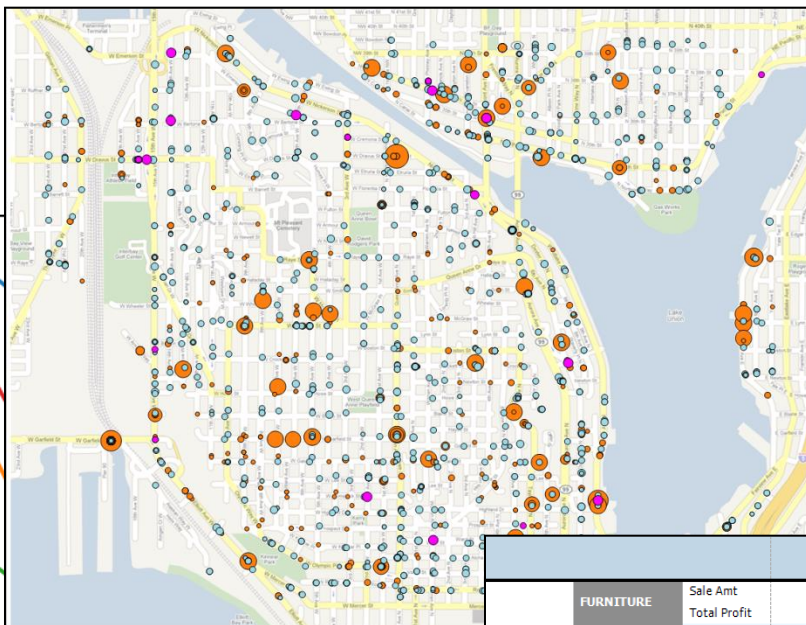
Supporting the “Cycle of Visual Analysis”:

## Expressive

There is no **single view** for  
all tasks and all data



# Expressive



					20												Grand Total	
					Q1	Q2												
CENTRAL	FURNITURE	Sale Amt	\$755	\$4,942	West	California												
		Total Profit	\$53	\$482		Nevada												
	OFFICE SUPPLIES	Sale Amt	\$30,336	\$17,503		Oregon												\$84,545
		Total Profit	\$7,071	\$3,646		Utah												\$2,899
	TECHNOLOGY	Sale Amt	\$77,475	\$49,930		Washington												\$167,643
		Total Profit	\$28,803	\$18,456														\$30,090
	Regional Total	Sale Amt	\$108,565	\$72,374		\$91,029	\$67,554	\$80,688	\$121,453	\$124,184	\$116,641							\$782,488
		Total Profit	\$35,927	\$22,584		\$19,737	\$19,906	\$17,500	\$36,384	\$37,583	\$34,962							\$224,584
	EAST	FURNITURE	Sale Amt	\$43,862		\$17,796	\$64,375	\$19,513	\$19,305	\$8,299	\$52,177	\$52,240						
Total Profit			\$5,262	(\$957)	\$1,871	(\$1,397)	(\$3,216)	(\$1,345)	(\$697)	\$6,211							\$5,733	
OFFICE SUPPLIES		Sale Amt	\$54,634	\$53,860	\$59,396	\$30,633	\$42,446	\$48,290	\$67,669	\$56,916							\$413,845	
		Total Profit	\$10,453	\$7,001	\$15,506	\$6,512	\$3,390	\$7,719	\$9,586	\$7,706							\$67,872	
TECHNOLOGY		Sale Amt	\$128,564	\$161,100	\$178,333	\$136,831	\$136,863	\$151,549	\$169,573	\$238,820							\$1,301,633	
		Total Profit	\$45,076	\$58,269	\$64,013	\$52,587	\$49,552	\$57,788	\$59,722	\$90,918							\$477,924	
Regional Total		Sale Amt	\$227,060	\$232,756	\$302,105	\$186,977	\$198,613	\$208,138	\$289,419	\$347,977							\$1,993,045	
		Total Profit	\$60,791	\$64,313	\$81,390	\$57,702	\$49,725	\$64,162	\$68,611	\$104,834							\$551,528	
Grand Total		Sale Amt	\$335,625	\$305,131	\$393,133	\$254,531	\$279,301	\$329,591	\$413,603	\$464,618							\$2,775,533	
	Total Profit	\$96,718	\$86,897	\$101,127	\$77,608	\$67,225	\$100,546	\$106,194	\$139,796							\$776,112		

		Coffee		Espresso		Smoothie		Tea							
		Anaretto	Columbian	Decaf Irish C.	Caffe Latte	Caffe Mocha	Decaf Espresso	Regular Espresso	Blueberry		Chocolate	Lemon	Darjeeling	Earl Grey	Green Tea
Central	Colorado														
	Illinois														
	Iowa														
	Missouri														
	Ohio														
East	Wisconsin														
	Connecticut														
	Florida														
	Massachusetts														
	New Hampshire														
South	New York														
	Louisiana														
	New Mexico														
	Oklahoma														
	Texas														
West	California														
	Nevada														
	Oregon														
	Utah														
	Washington														
															Grand Total

advice:

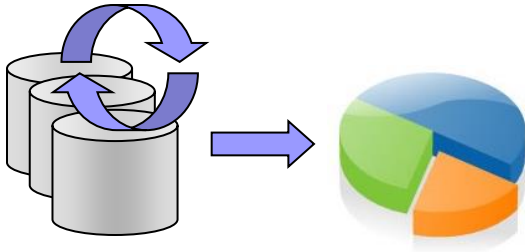
Reverse your thinking

– start with the data

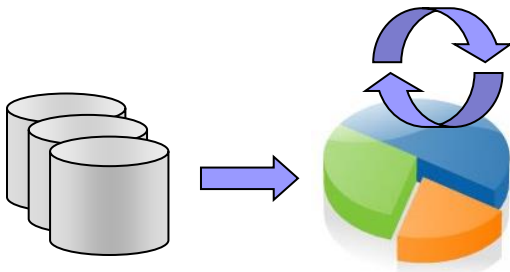


Supporting the “Cycle of Visual Analysis”:

# Unification with the database

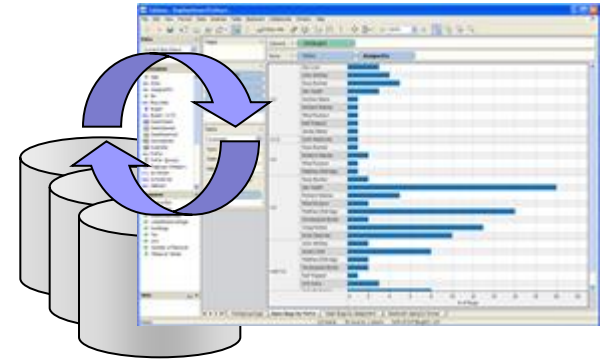


**Traditional Reporting Tools**



**Traditional Visualization Tools**

**versus**



**Tableau**

Supporting the “Cycle of Visual Analysis”:

# Unification with the database

Leverage the **revolutionary** changes  
in **database technology**



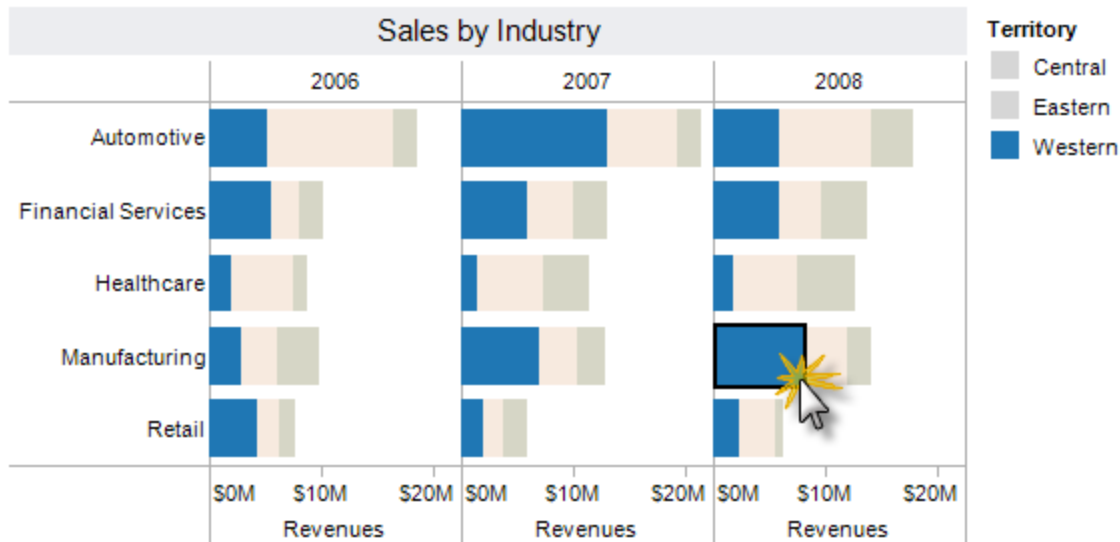
Supporting the “Cycle of Visual Analysis”:

## Direct Interaction

**Make the tool disappear.**

Allow the user to

**directly interact**  
with the data.



Sales by industry for each territory. The Western region has grown its manufacturing sales but lost retail sales.



# Where can you use Tableau?

- Analyze student data
  - Enrollment statistics
  - Achievement
  - Demographics
- Target areas for alumni activities and demographics
- Data-driven feedback on student performance
- Course, program, college, and teacher evaluations
- Public reporting for parents and public

# Find out more...

- Education Analysis solutions page
  - <http://www.tableausoftware.com/solutions/education-analytics>



**+tableau®**  
S O F T W A R E