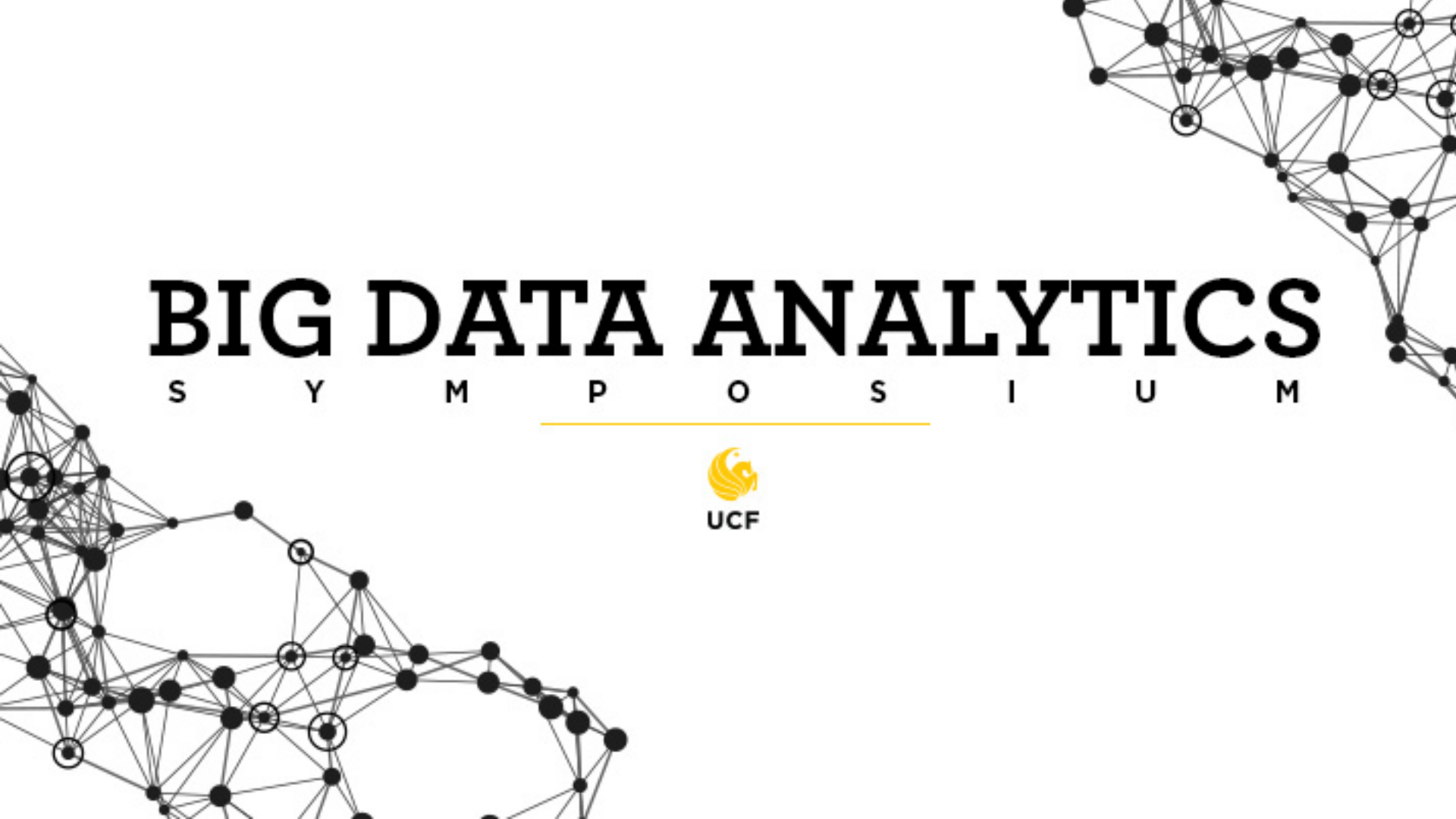

BIG DATA ANALYTICS
SYMPOSIUM
UCF


The
FUTURE
came yesterday


FUTURE

THE FUTURE

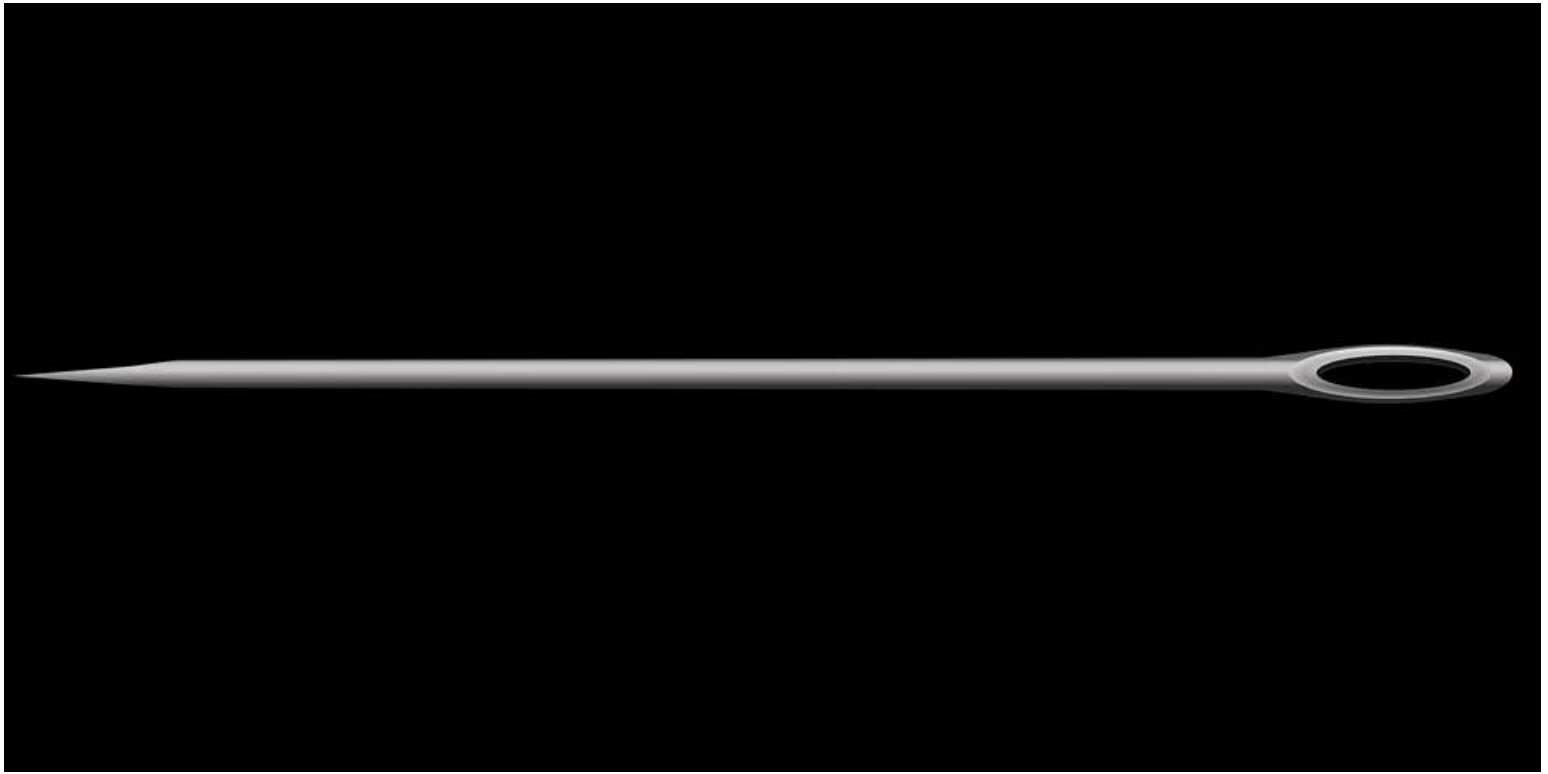
PREDICTIONS OF THE FUTURE

QUALITY OF THE PREDICTIONS

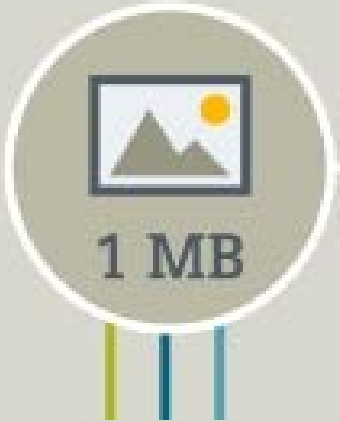
QUALITY OF THE INFORMATION

QUALITY OF THE DATA ANALYSIS

BIG DATA



Big Data – How Big Is Big?



1 megabyte ...

The typical size of a compressed digital image.

1 gigabyte ...

The storage capacity of a small MP3 player.

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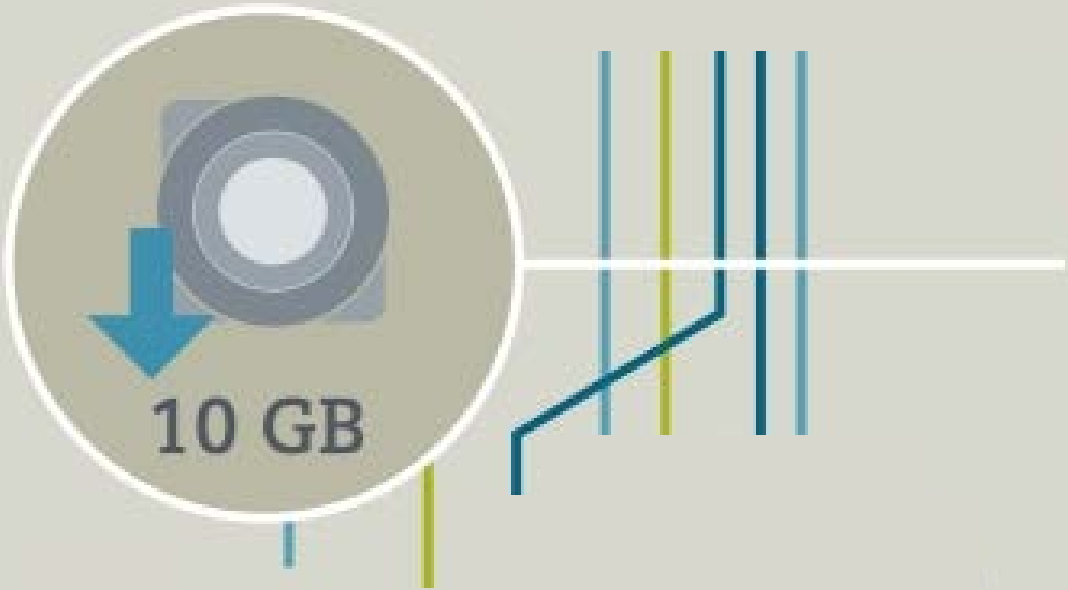


10 gigabyte ...

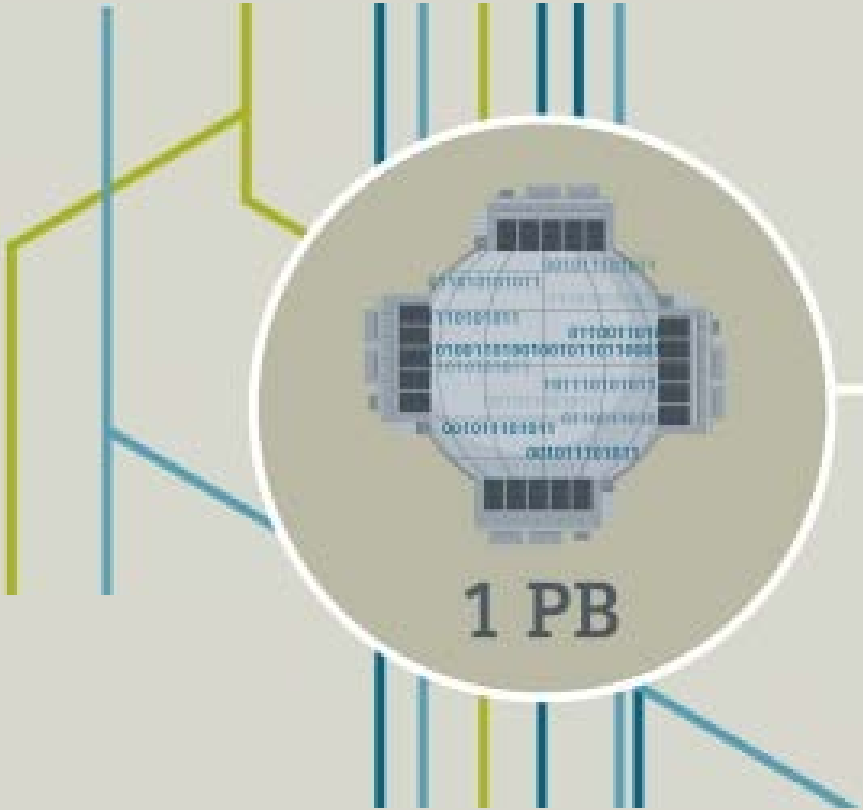
The size of an update for a CT scanner.

100 gigabyte ...

The amount of data that the 600 Siemens control systems installed in CERN's particle accelerator produce per day.

1 terabyte ...

The storage capacity of a typical hard drive in 2014.



1 petabyte ...

The capacity of all data centers worldwide in 2002.

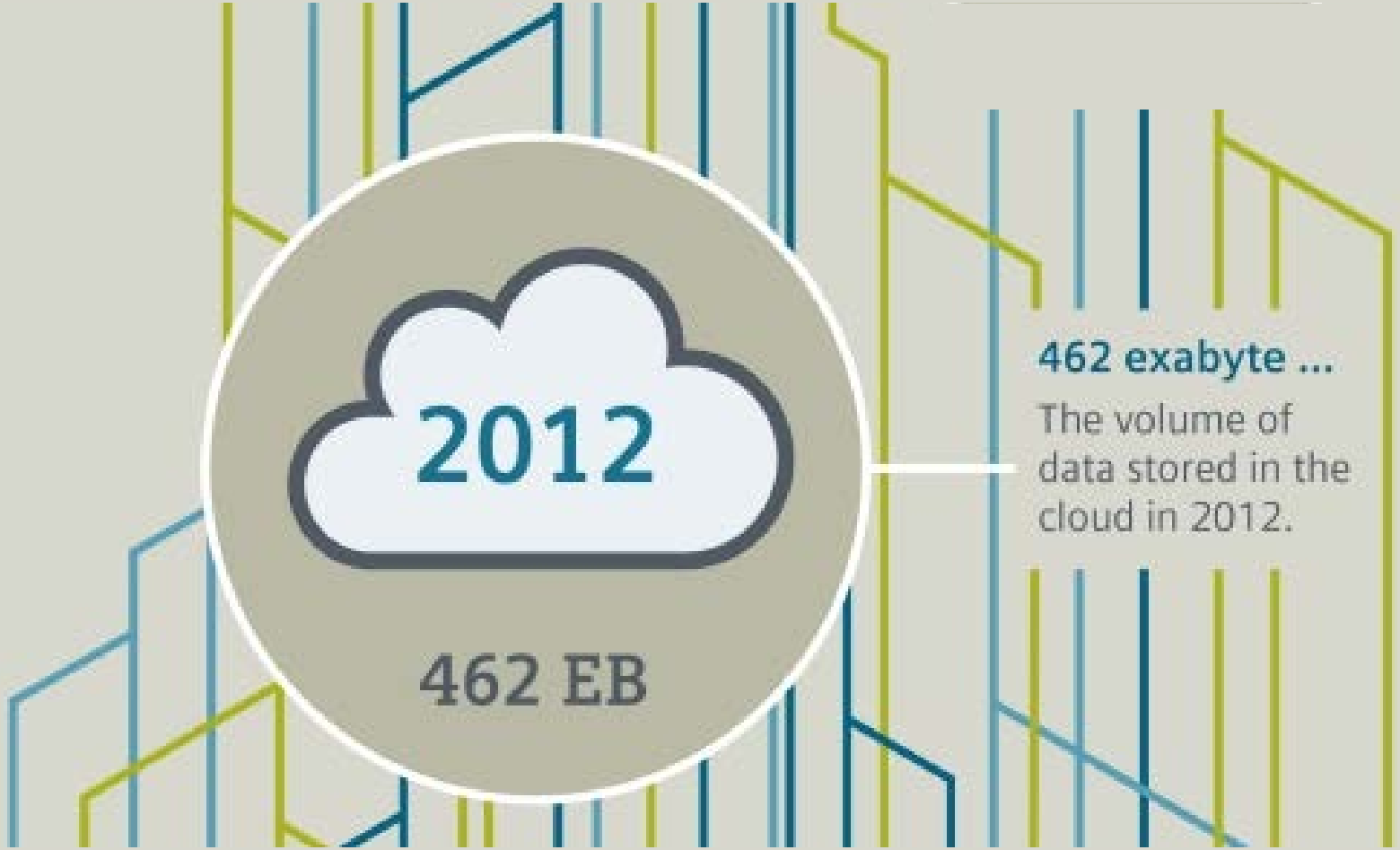
11 petabyte ...

The capacity of Siemens' data centers in 2014.

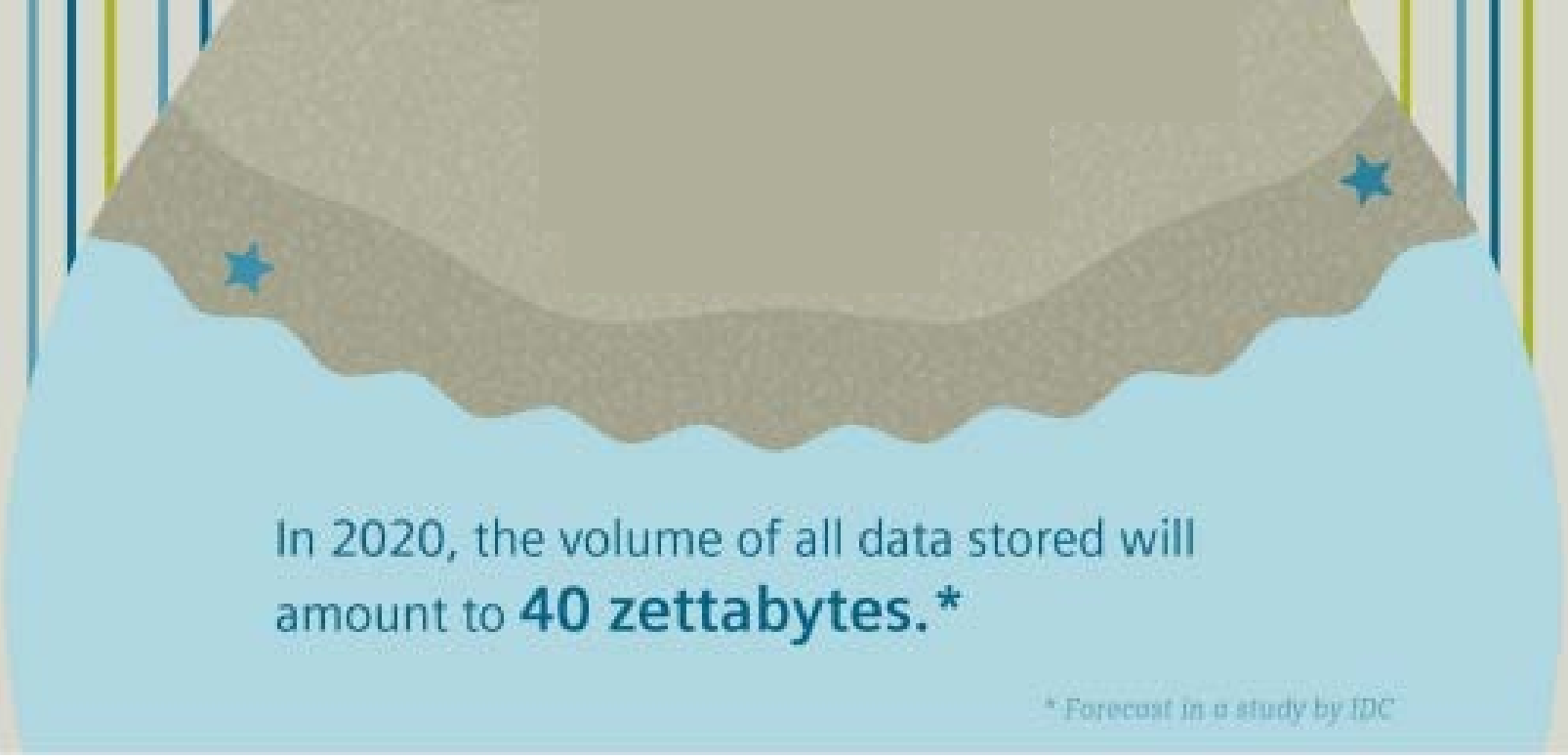
1 exabyte ...

Five times the amount of information contained in all the books ever printed.


52 exabyte ...
The volume of data stored in the cloud in 2010.
2010
52 EB


2012
462 EB
462 exabyte ...
The volume of data stored in the cloud in 2012.


1 ZE
1 zettabyte ...
1.5 times the amount of all grains of sand on all beaches on earth.



How can we make practical use of these data volumes?

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Maybe that’s a better question for you :-)

How can we make practical use of these data volumes?

The future came yesterday

1876:
"The Americans have need of the telephone, but we do not. We have plenty of messenger boys." — William Preece, British Post Office.

1878

?

X

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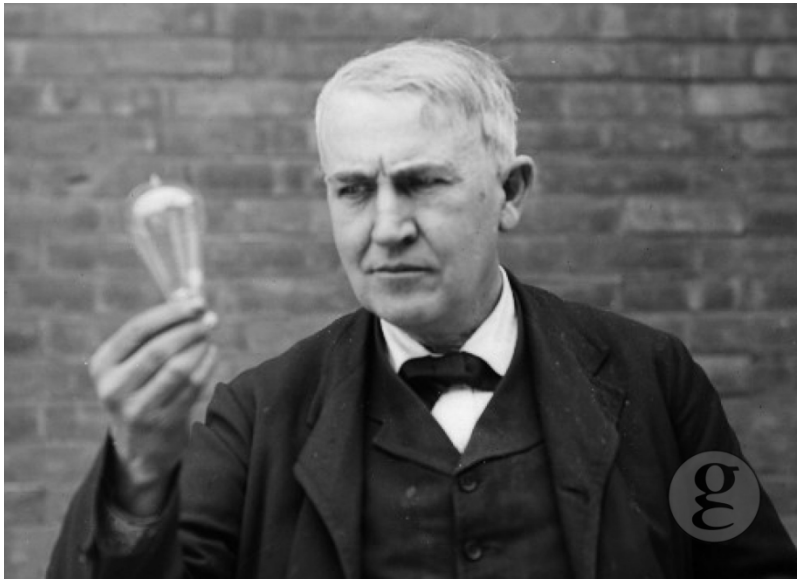
1889:
“Fooling around with alternating current (AC) is just a waste of time. Nobody will use it, ever.” — Thomas Edison



1886

X ? !

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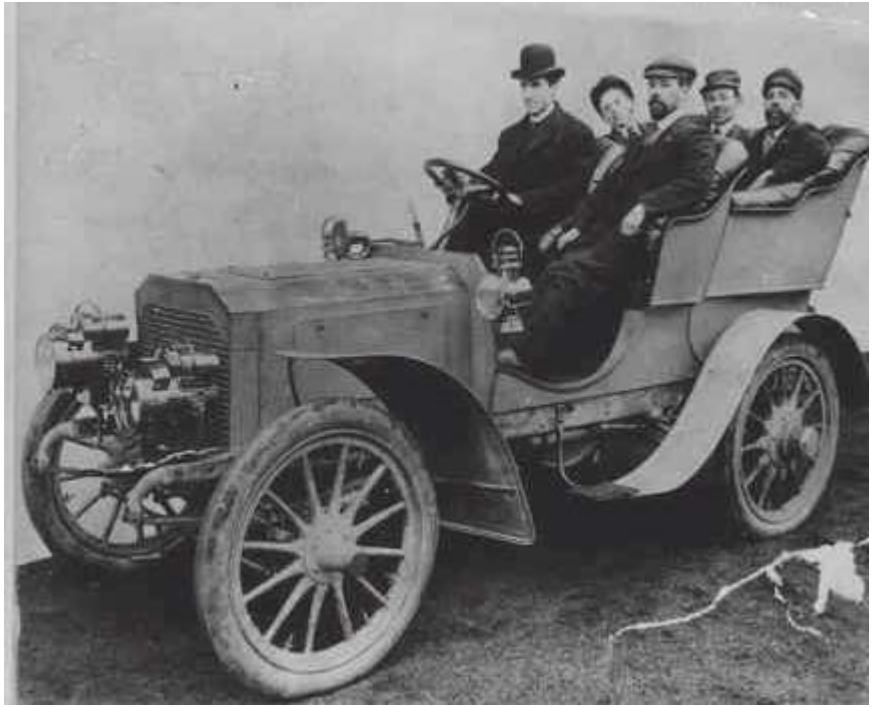

1903:
“The horse is here to stay but the automobile is only a novelty – a fad.” — President of the Michigan Savings Bank advising Henry Ford’s lawyer, Horace Rackham, not to invest in the Ford Motor Company.

1913

?

X

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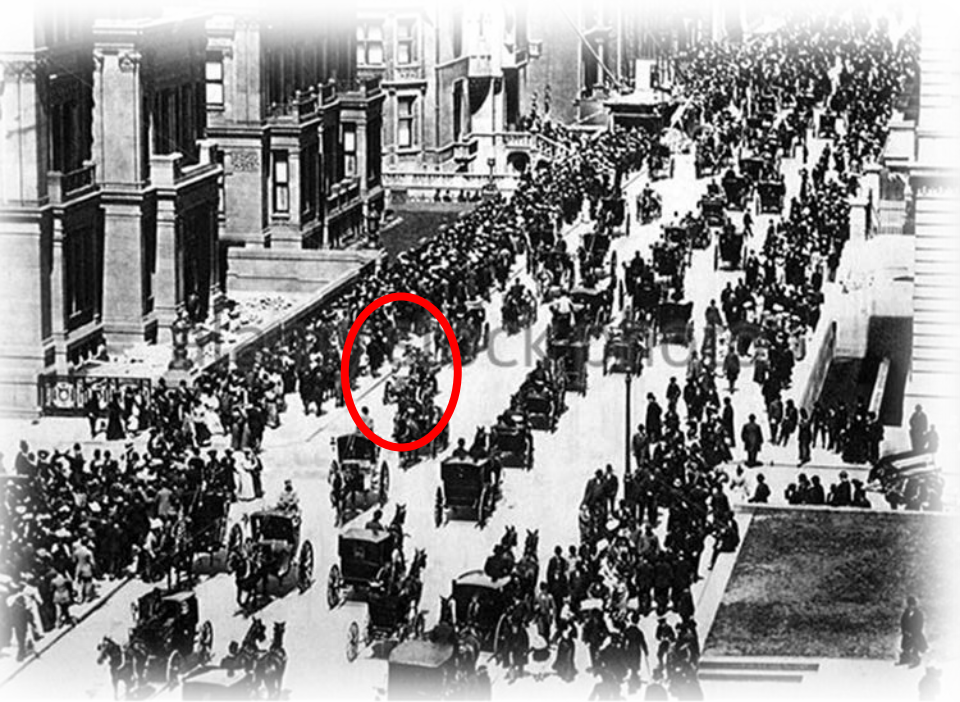
5th Avenue, New York

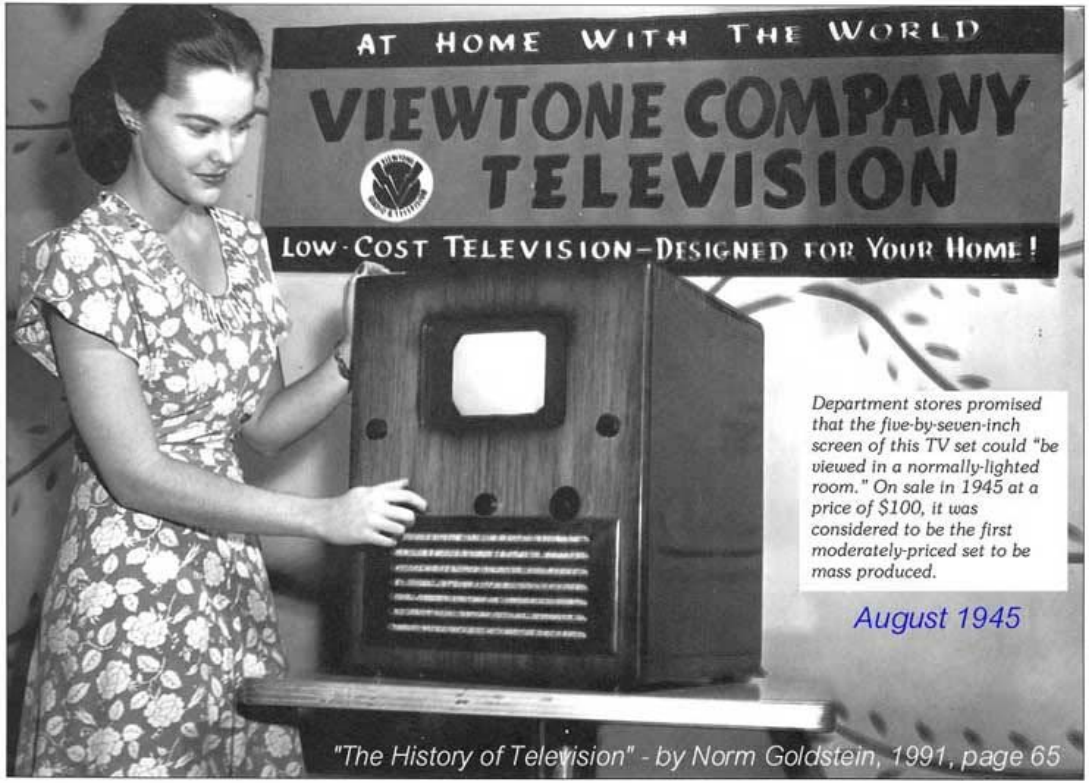


Easter, 1900

5th Avenue, New York

Easter, 1913

1946:
"Television won't be able to hold on to any market it captures after the first six months. People will soon get tired of staring at a plywood box every night." — Darryl Zanuck, 20th Century Fox.



1947

1950:
Vacuum Tube Powered Trains
"There is no fundamental reason," says Doctor Langmuir, "why we could not travel at a speed of 2000 to 5000 miles an hour in a vacuum tube. The Pacific coast might be only an hour away from the Atlantic.“

2020

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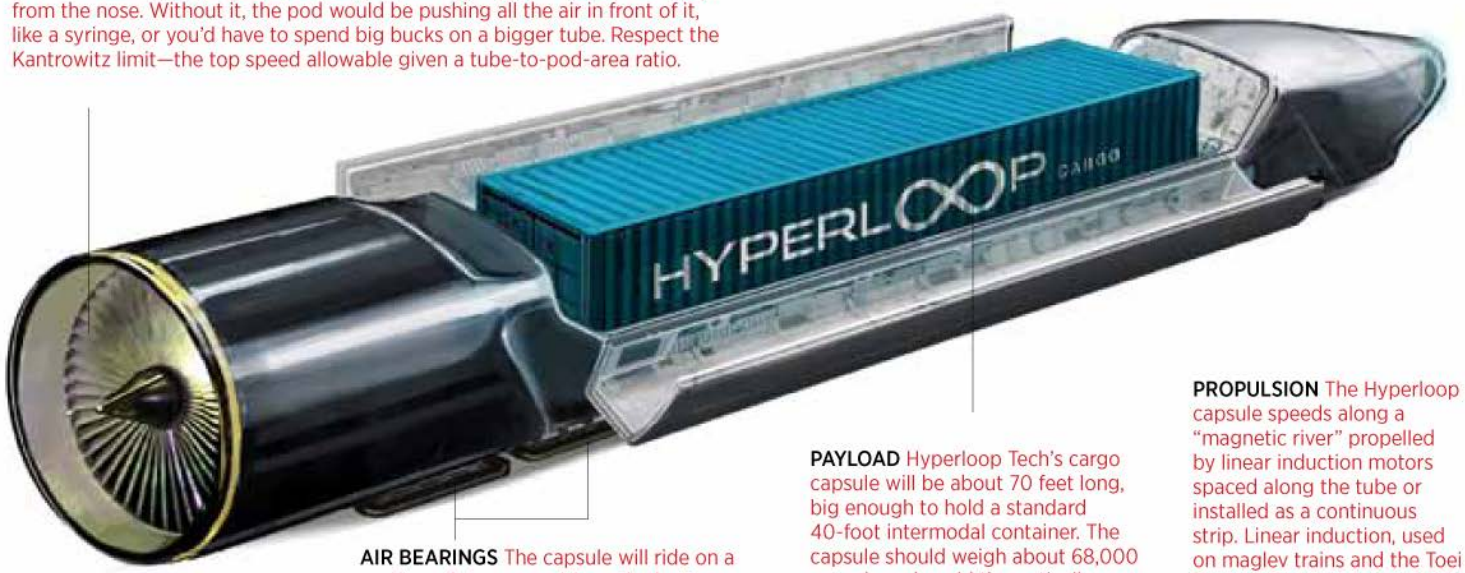
HOW THE HYPERLOOP WORKS

Elon Musk said that if the Concorde, a railgun and an air-hockey table had a three-way, the hyperloop would be the love child. Here's a look inside Hyperloop Tech's high-speed cargo pod.

VACUUM TUBE Capsules will travel in a near-vacuum to reduce drag significantly. Valves and pumps will keep internal air pressure at about 100 Pascals, or one-thousandth the air pressure at sea level. A little nitrogen may be injected into the tube as a desiccant.

COMPRESSOR Mounting a giant compressor fan on the front of the capsule is what makes the hyperloop possible, transferring huge volumes of air away from the nose. Without it, the pod would be pushing all the air in front of it, like a syringe, or you'd have to spend big bucks on a bigger tube. Respect the Kantrowitz limit—the top speed allowable given a tube-to-pod-area ratio.



AIR BEARINGS The capsule will ride on a cushion of air pumped from the bottom of lunch-tray-size sleds. Landing gear may need to be deployed as it comes to a stop.

PAYLOAD Hyperloop Tech's cargo capsule will be about 70 feet long, big enough to hold a standard 40-foot intermodal container. The capsule should weigh about 68,000 pounds and could theoretically accelerate from zero to 750mph in less than a minute.

PROPULSION The Hyperloop capsule speeds along a "magnetic river" propelled by linear induction motors spaced along the tube or installed as a continuous strip. Linear induction, used on maglev trains and the Toei Ōedo Line in Tokyo's subway, has no moving parts and low maintenance costs.

1950:
Housekeeping of the future
When the housewife of 2000 cleans house she simply turns the hose on everything. Why not? Furniture (upholstery included), rugs, draperies, unscratchable floors—all are made of synthetic fabric or waterproof plastic. After the water has run down a drain in the middle of the floor (later concealed by a rug of synthetic fiber) she turns on a blast of hot air and dries everything.

1964

2004

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X

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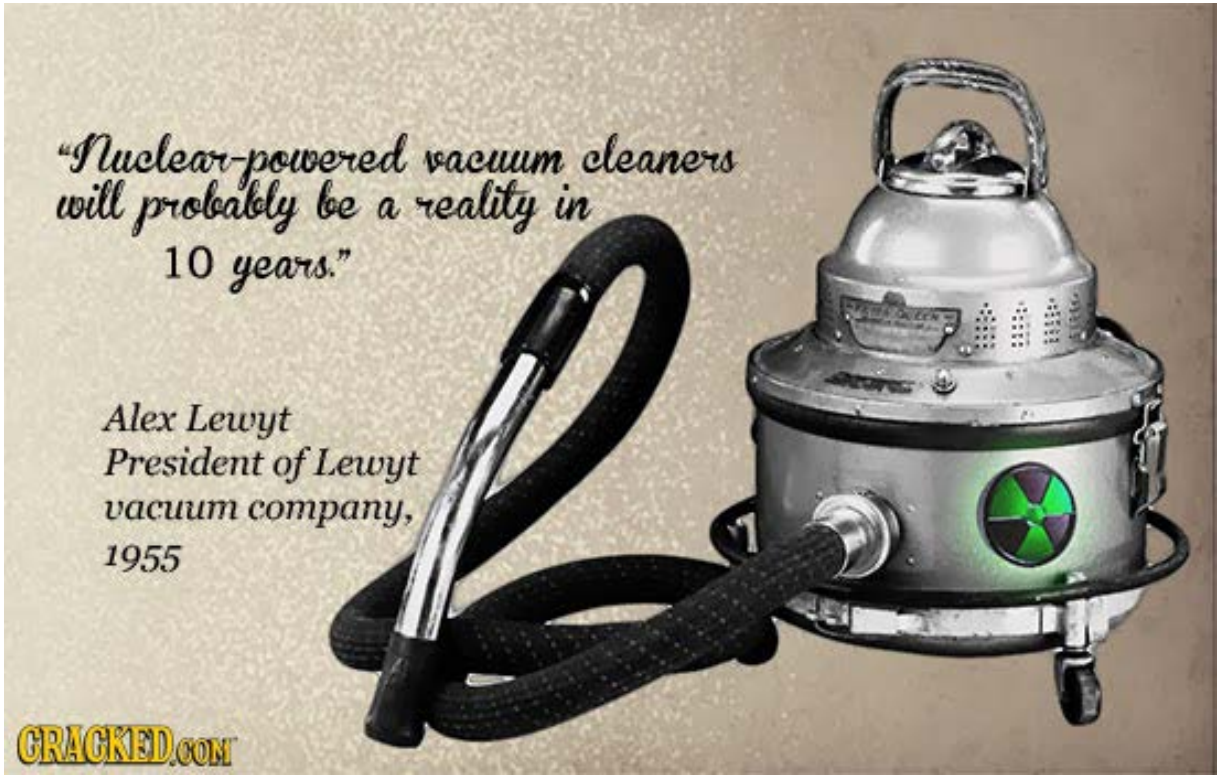

1965

2017

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X

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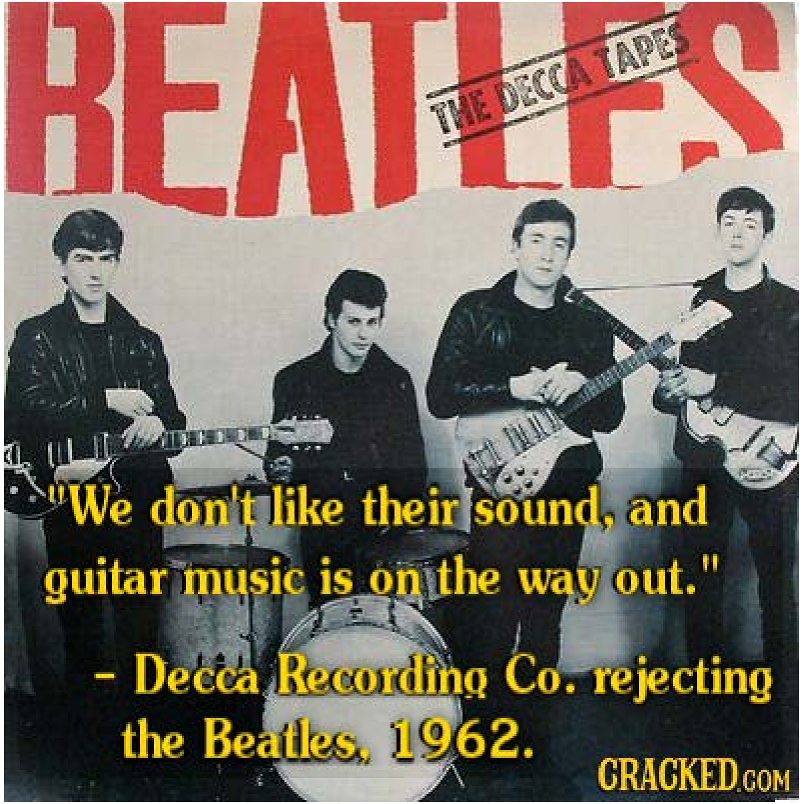
1957:
Flying Fan Vehicle
The "flying fan" vehicles of the future will be easier to fly than helicopters, and should cost a lot less. A rough guess is that in about 10 years you'll be able to buy a four-place fan for the price of a good car.

1967 2017

? ! X

1962:
Decca Records rejected the Beatles, saying "guitar groups are on the way out" and "The Beatles have no future in show business,"



1963

? X !

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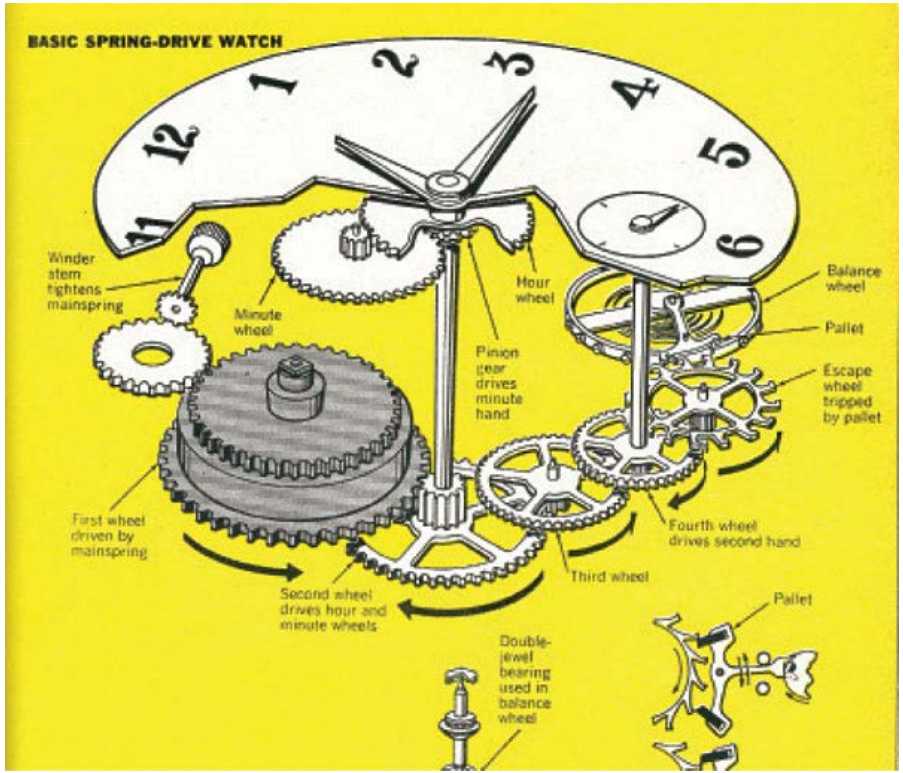

2000 2013

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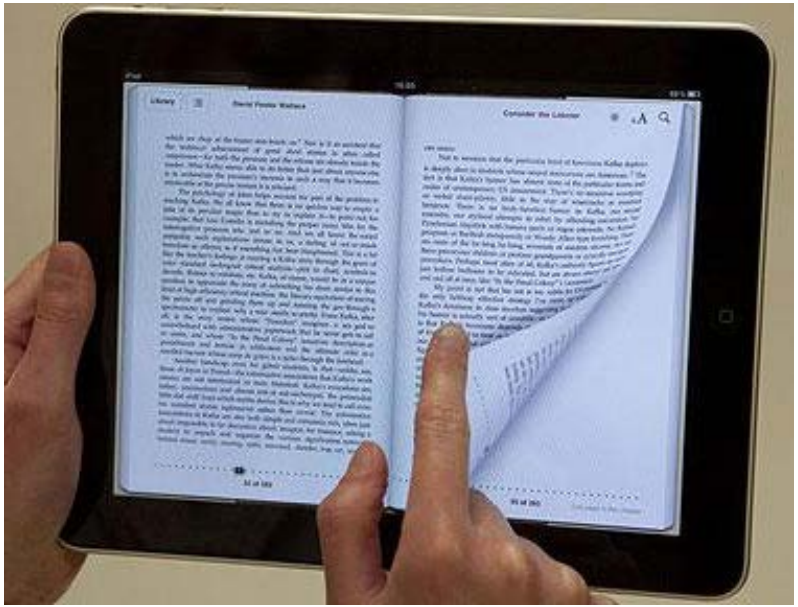
X



"Nicholas Negroponte, director of the MIT Media Lab, predicts that we'll soon buy books and newspapers straight over the Internet. Uh, sure.

So how come my local mall does more business in an afternoon than the entire Internet handles in a month?"

Clifford Stoll (1995, in Newsweek)

1998

?

X

!

CRACKED.COM

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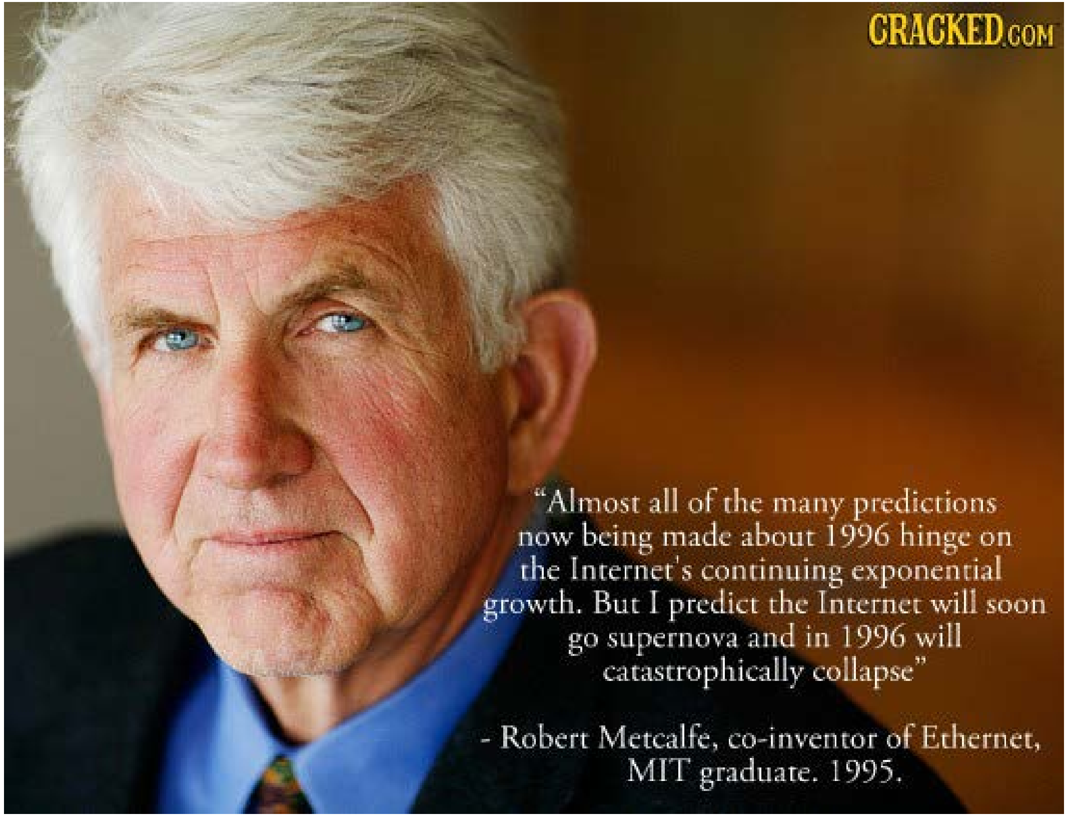
He also predicted that wireless networking would die out in the mid 1990s.:

After the wireless mobile bubble bursts this year, we will get back to stringing fibers ... bathrooms are still predominantly plumbed. For more or less the same reason, computers will stay wired.



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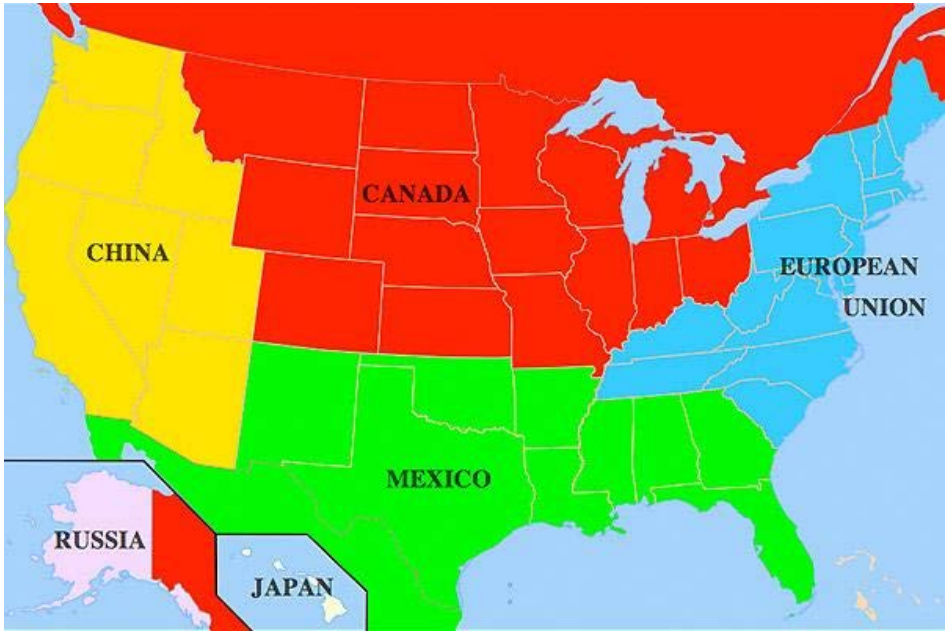


1998:
2010 collapse of the United States

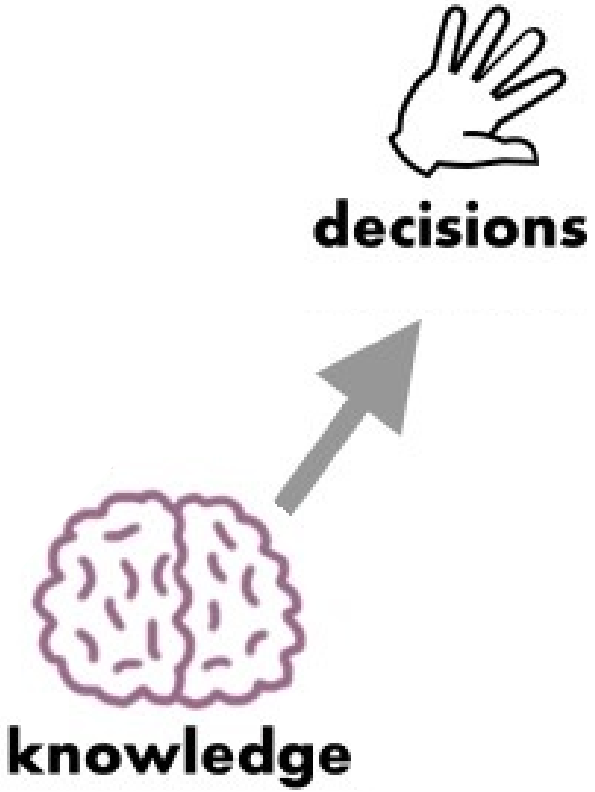
Russian political writer Igor Panarin claimed that the U.S. was on the verge of civil war, which would result in wealthier states withholding tax revenue from the federal government and seceding from the union. After the resulting collapse of the nation, it would be split into six parts and divided up by the newly dominant world powers. "There's a 55 to 45 percent chance right now that disintegration will occur," he said.

2007:
“There’s no chance that the iPhone is going to get any significant market share.”
— Steve Ballmer, Microsoft CEO.

43.5%
2016
?
X
!

The future came yesterday

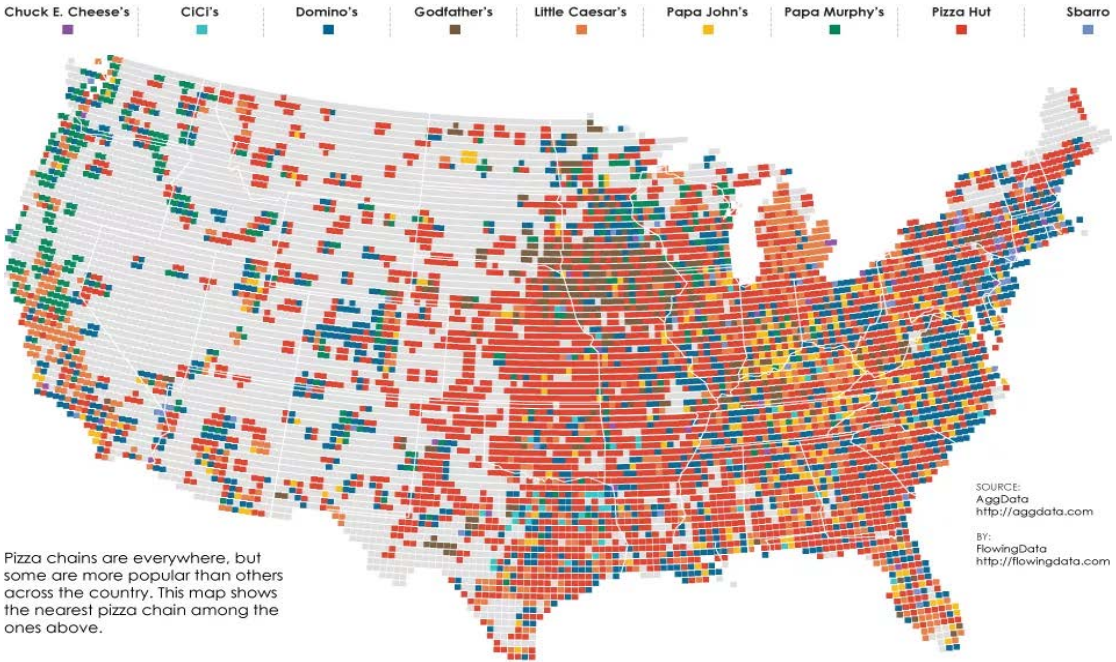
…and we partially predicted only 2 out of 15 outcomes


decisions
knowledge

data

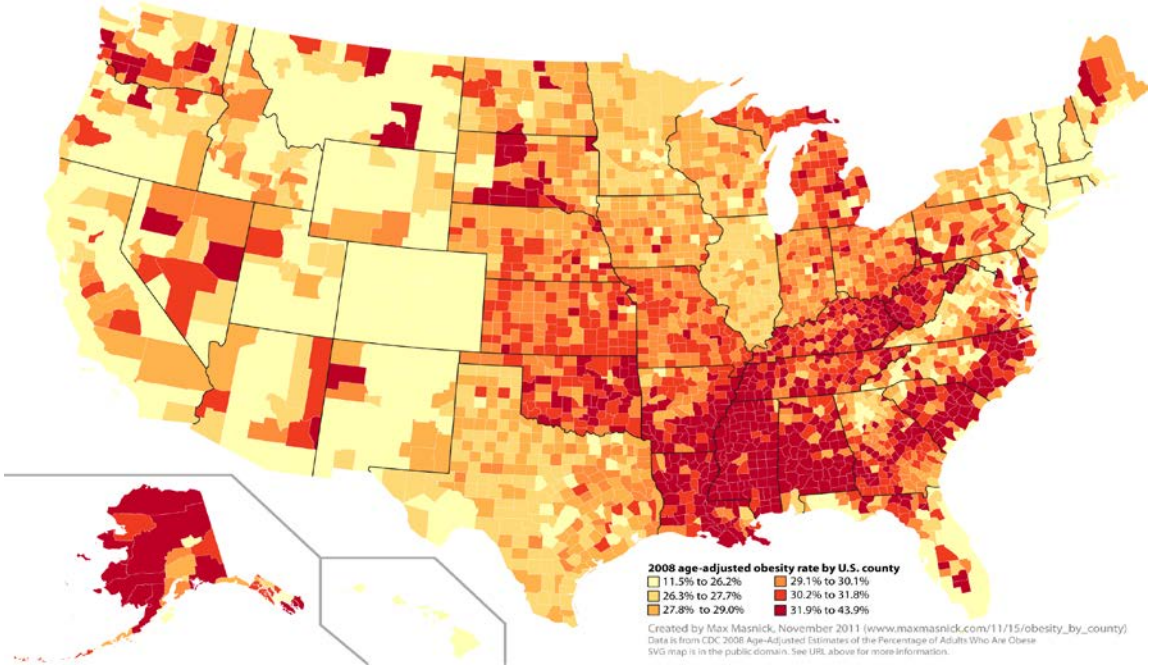
facts

Pizza Place Geography

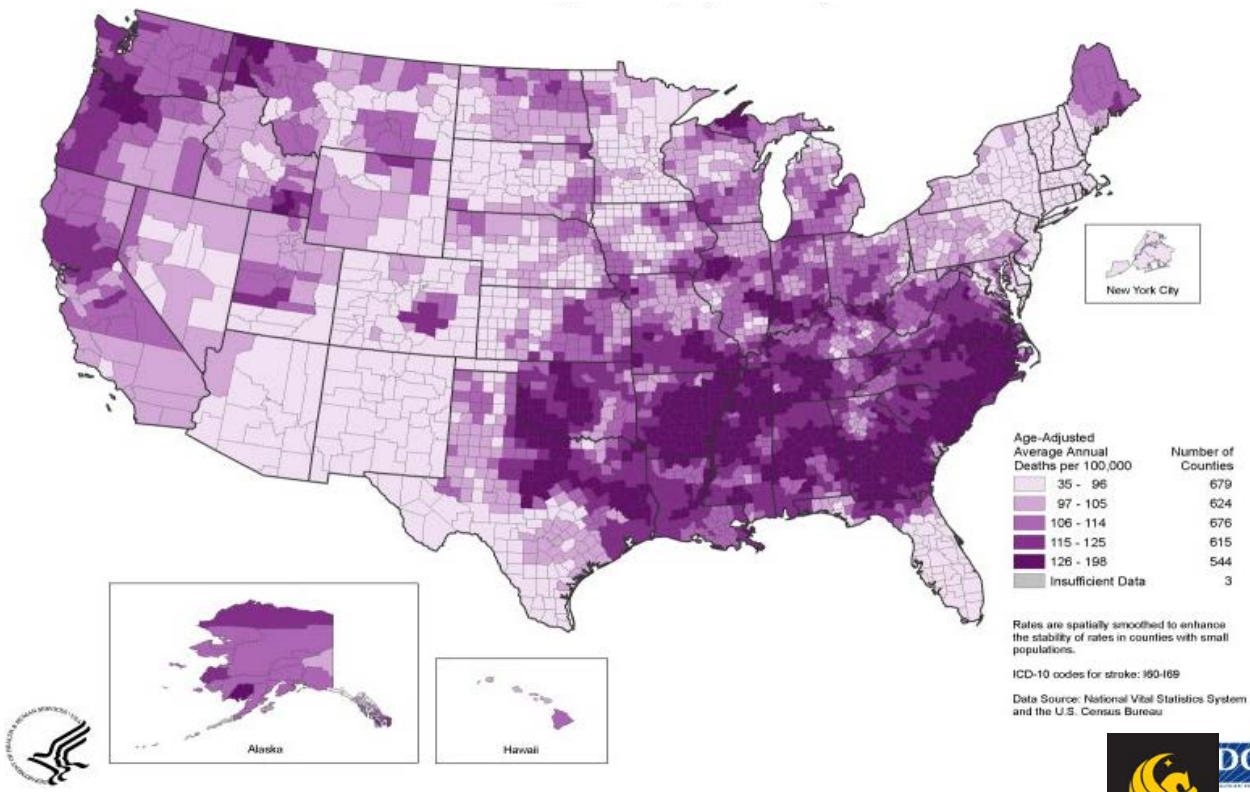


Pizza chains are everywhere, but some are more popular than others across the country. This map shows the nearest pizza chain among the ones above.

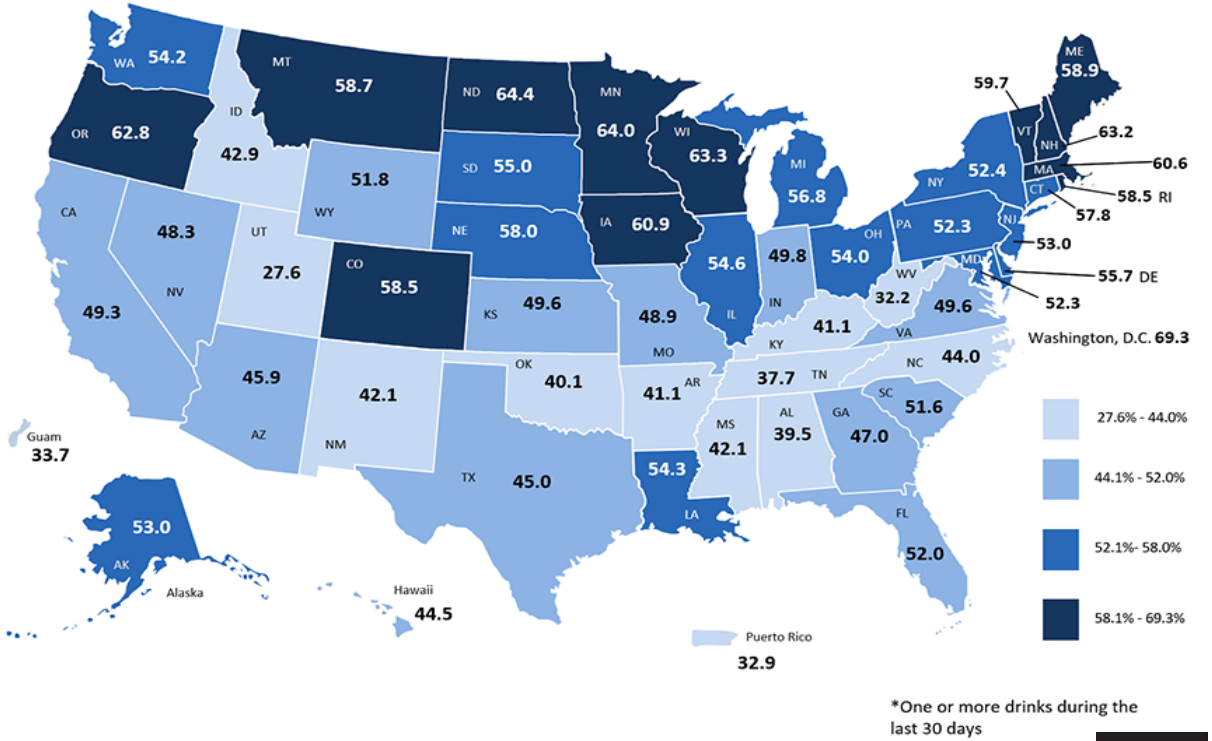
Age Adjusted Obesity Rates



Stroke Death Rates, Ages 35+



Weighted Estimates of Alcohol Use Among Women Aged 18-44 Years



*One or more drinks during the last 30 days

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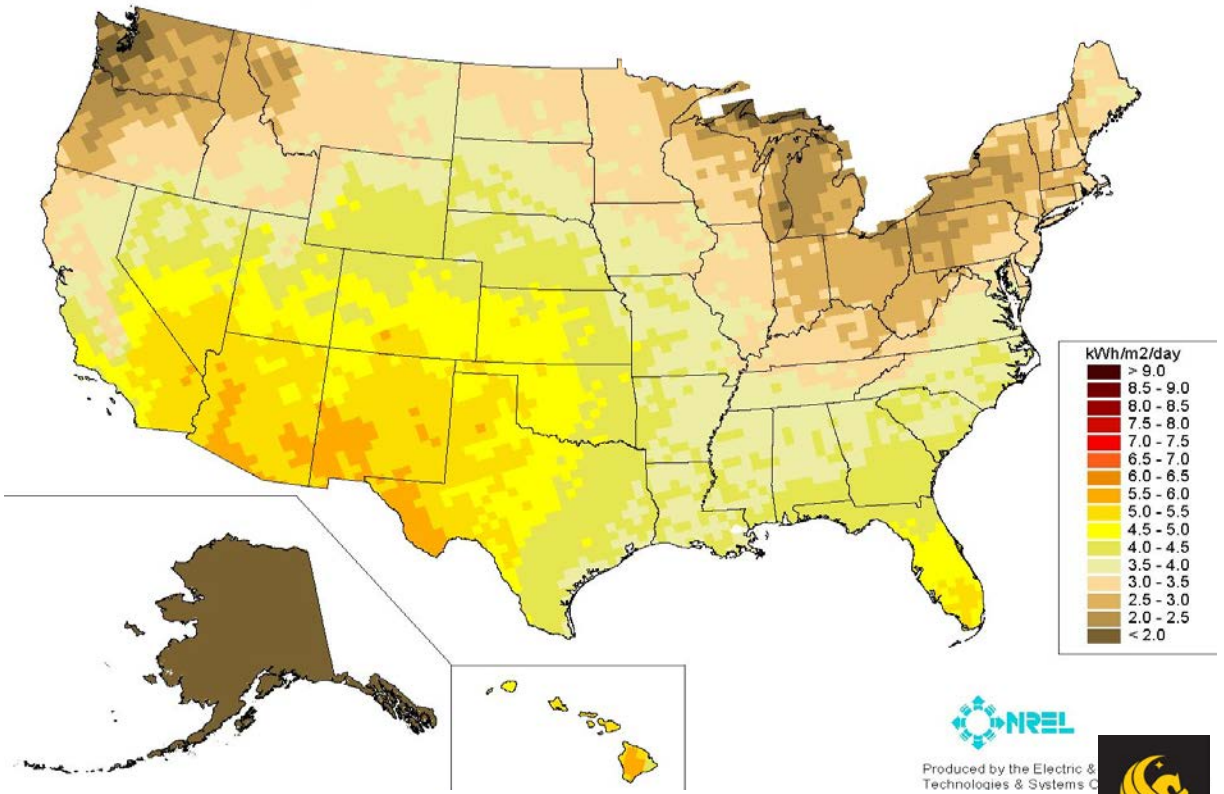
PV Solar Radiation



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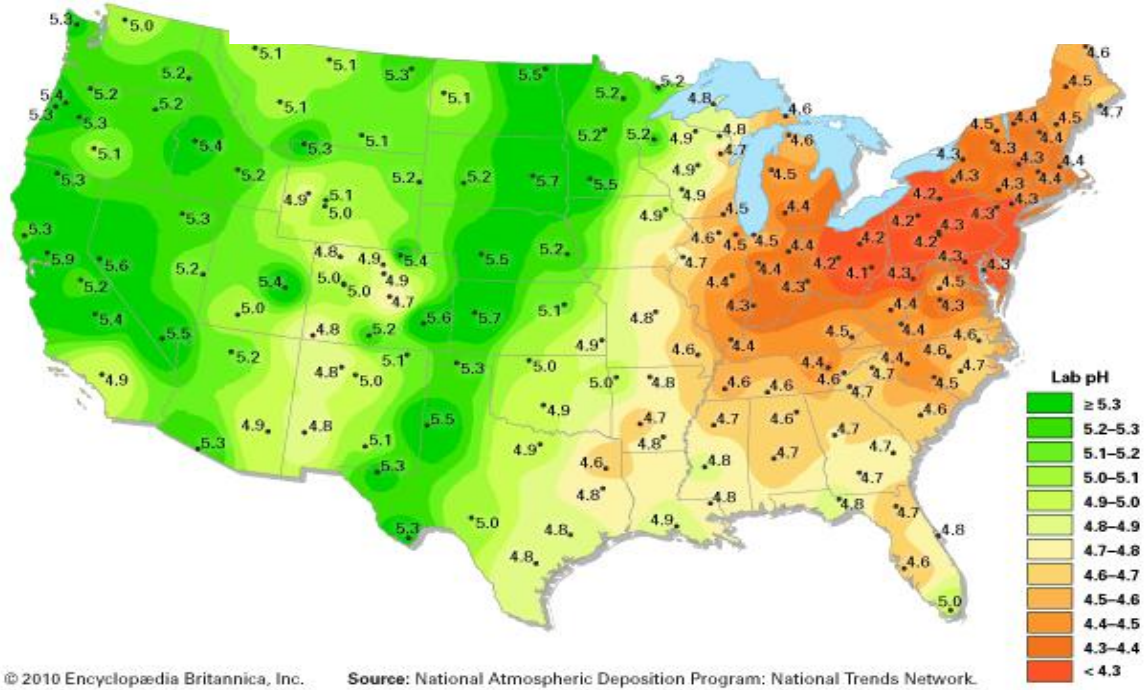
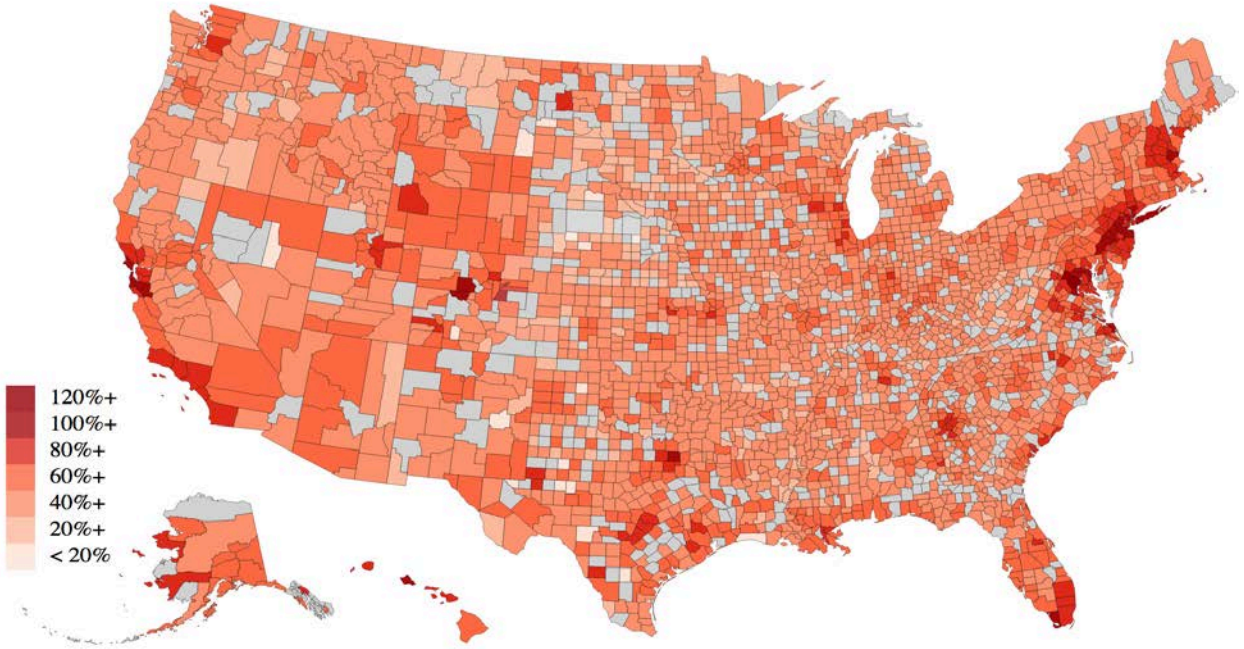
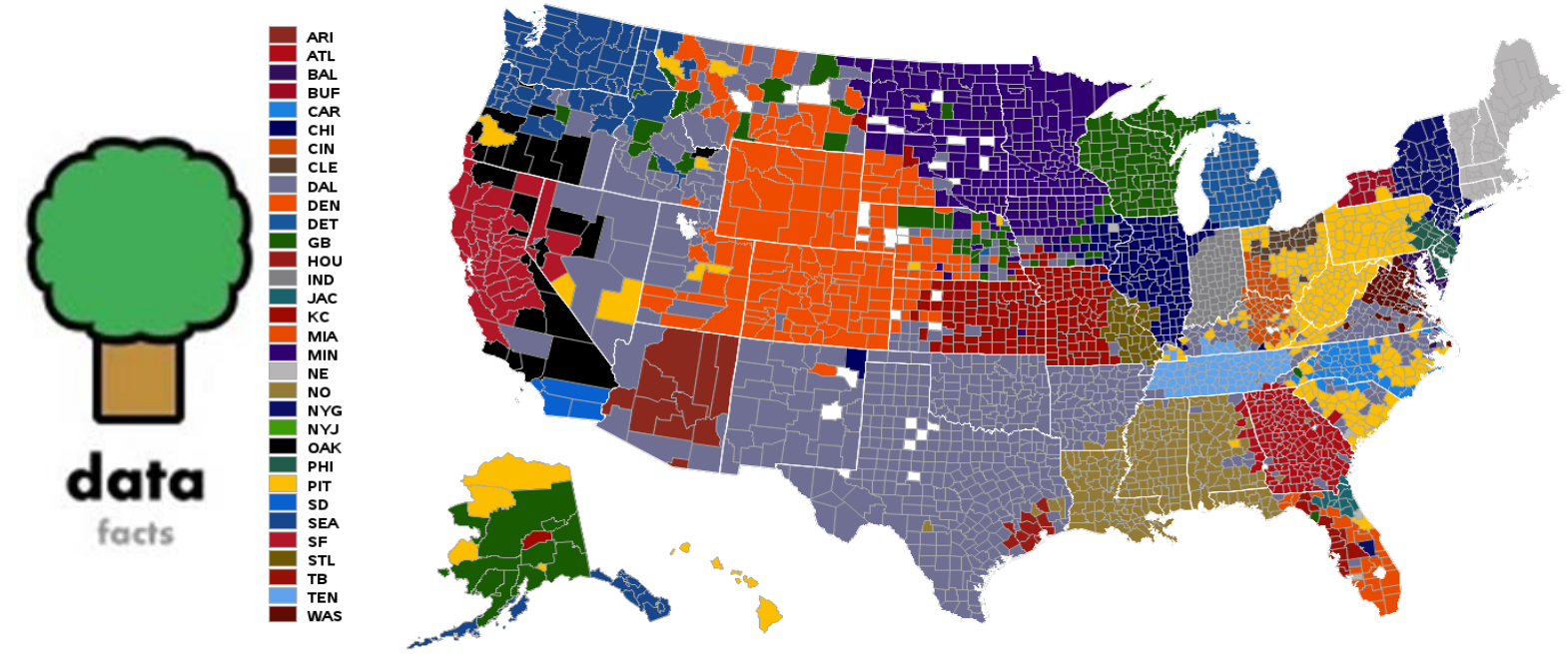
Annual pH of Precipitation



2 Bedroom Rent as Gross Income (%)

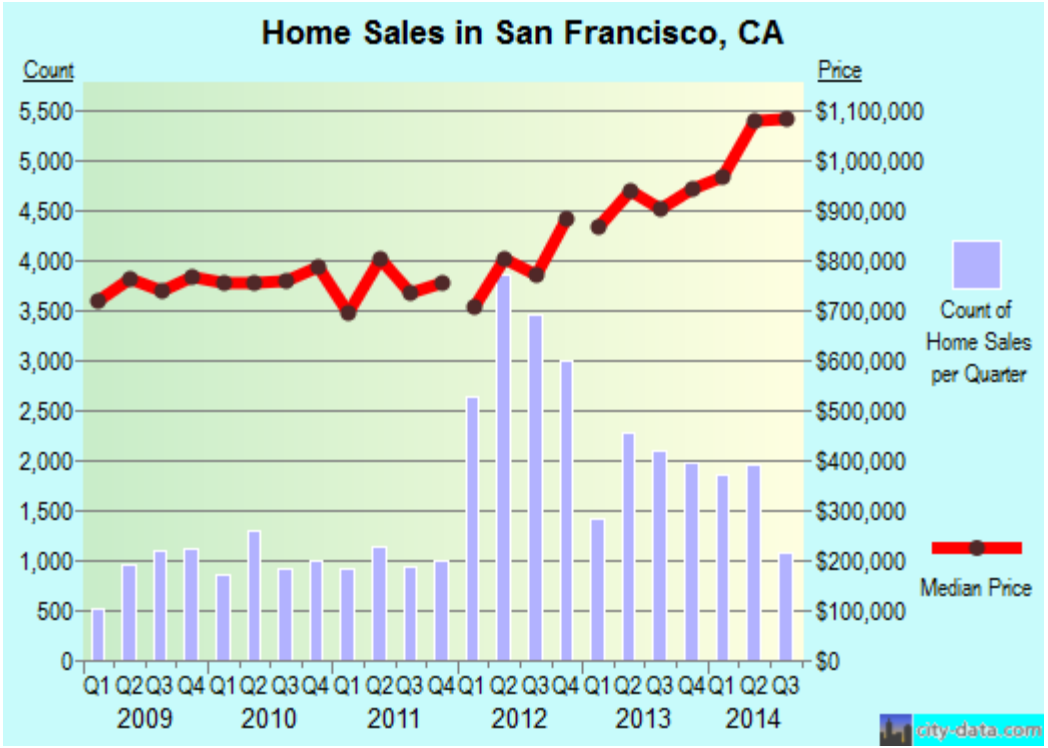


NFL Fans (based on Facebook)



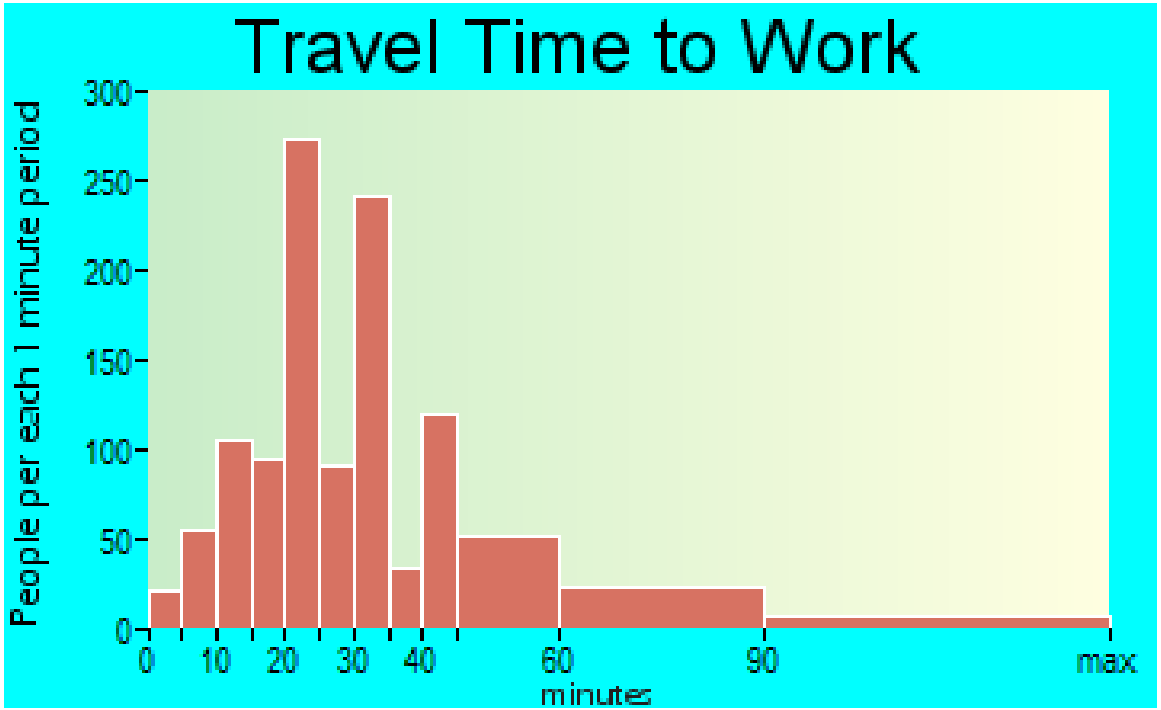
Based on Facebook data, January 2013

San Francisco



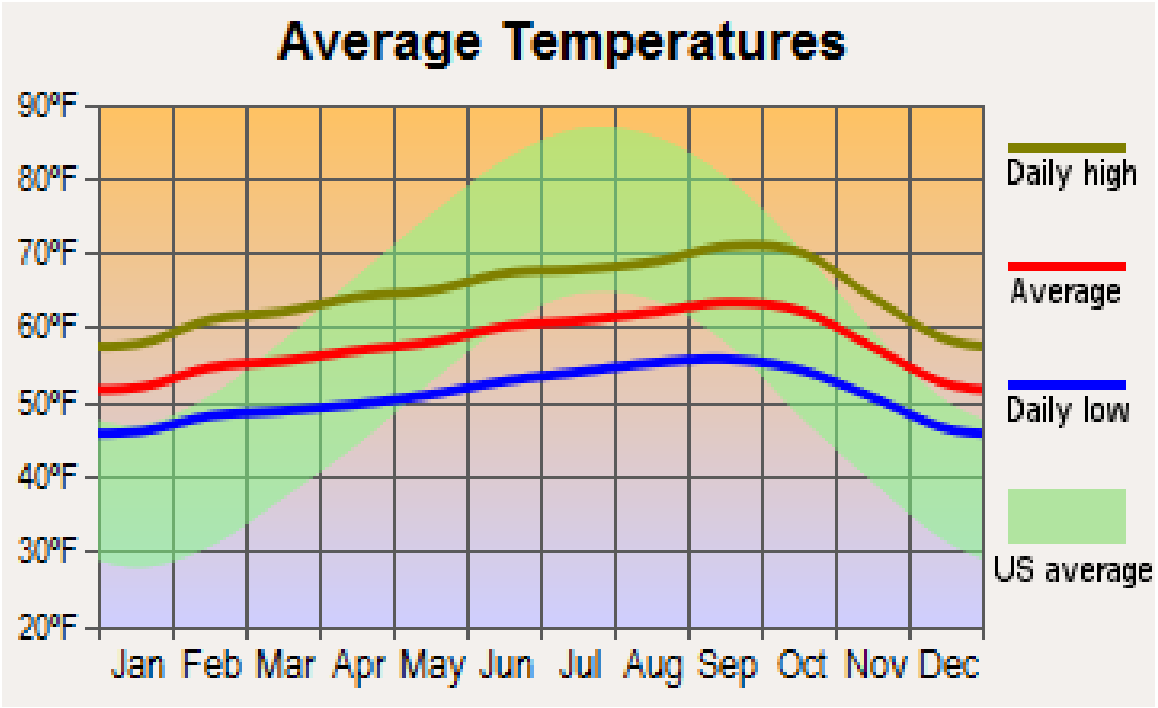
data
facts

San Francisco

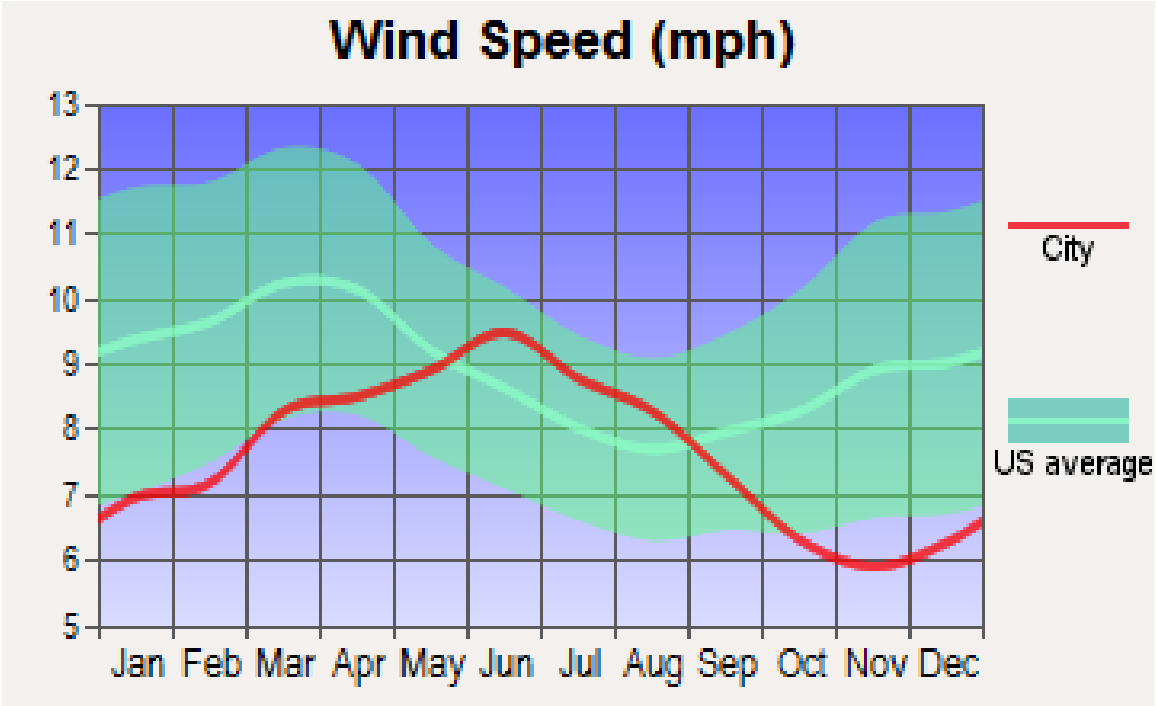


data
facts

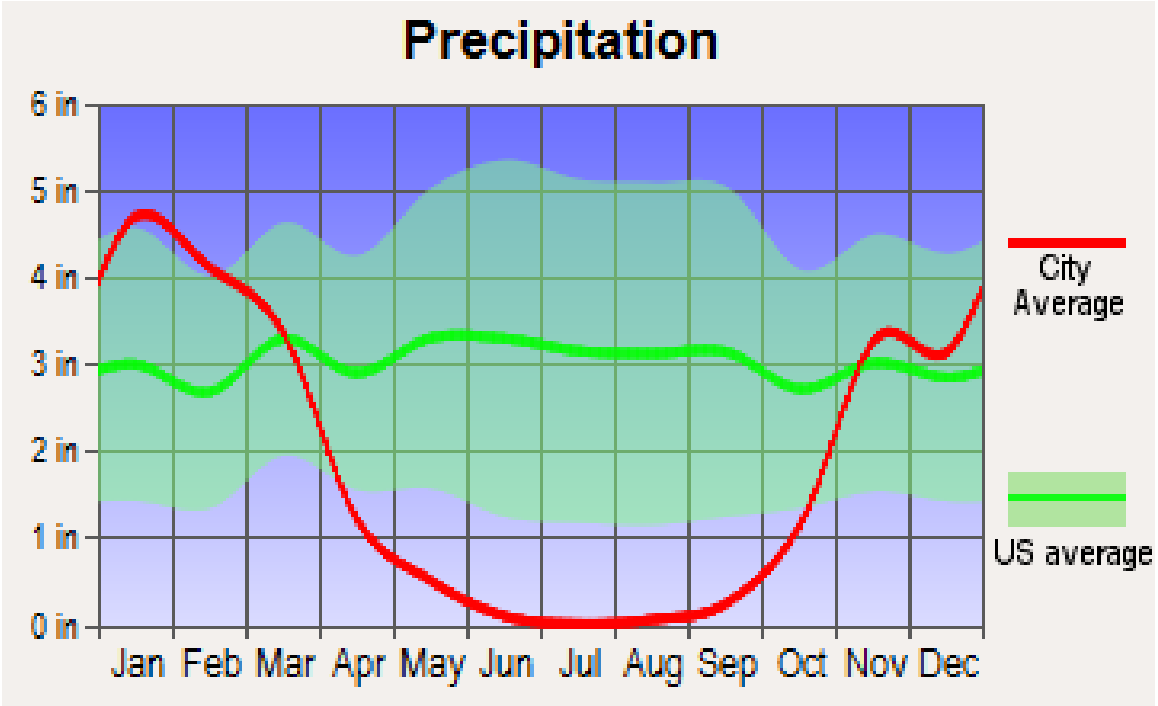
San Francisco



San Francisco



San Francisco




Downtown San Francisco
TREES
CRIMES
CABS
data
facts
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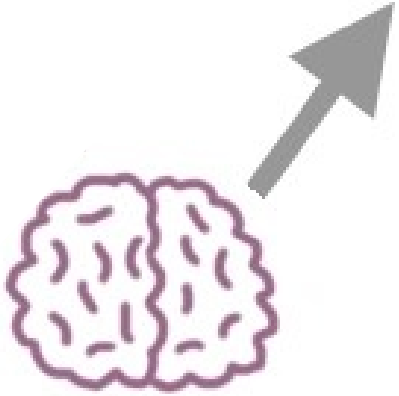
data

facts

decisions



knowledge

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The future came yesterday

Some future predictions were good,
Some future predictions were not.

In the past, we made predictions by guessing,
Now we can leverage data analytics.

Tomorrow is coming (again),
What do you predict will happen?

Anthony Renda