



# What is “Big Data” ?



Weekly charts

Chart (2014)	Peak position
Canada (Canadian Hot 100) <sup>[10]</sup>	75
US Bubbling Under Hot 100 Singles (Billboard) <sup>[11]</sup>	6
US Hot Rock Songs (Billboard) <sup>[10]</sup>	8
US Rock Airplay (Billboard) <sup>[12]</sup>	2
US Adult Alternative Songs (Billboard) <sup>[13]</sup>	13
US Adult Top 40 (Billboard) <sup>[14]</sup>	30
US Alternative Songs (Billboard) <sup>[10]</sup>	1

# What is “Big Data” ?

## Large amounts of data

Changed factor = Quantity

“Organizations have always accumulated information but, in this digital age, the amount of data being generated and retained is **growing exponentially**”

– Morrison | Foerster

“An all-encompassing term for any collection of data sets so large or complex that it becomes **difficult to process** them using traditional data processing applications” - wikipedia

## New analytical processes

New data uses

“Big data describes the process of extracting **actionable intelligence** from disparate, and often times non-traditional, data sources.”

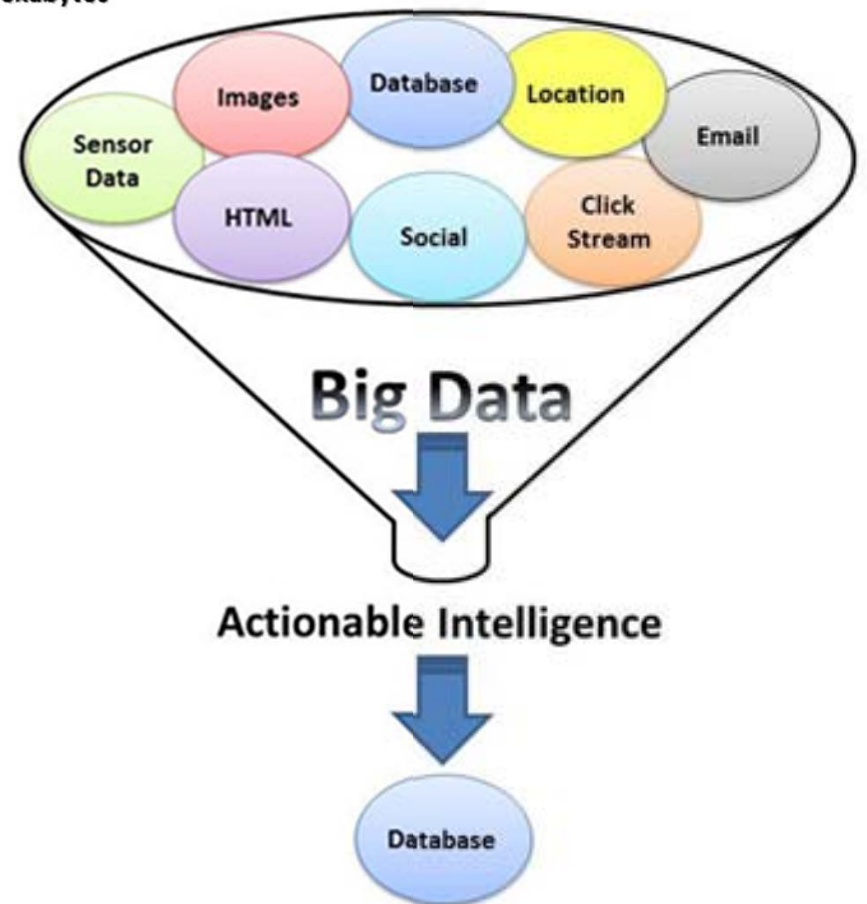
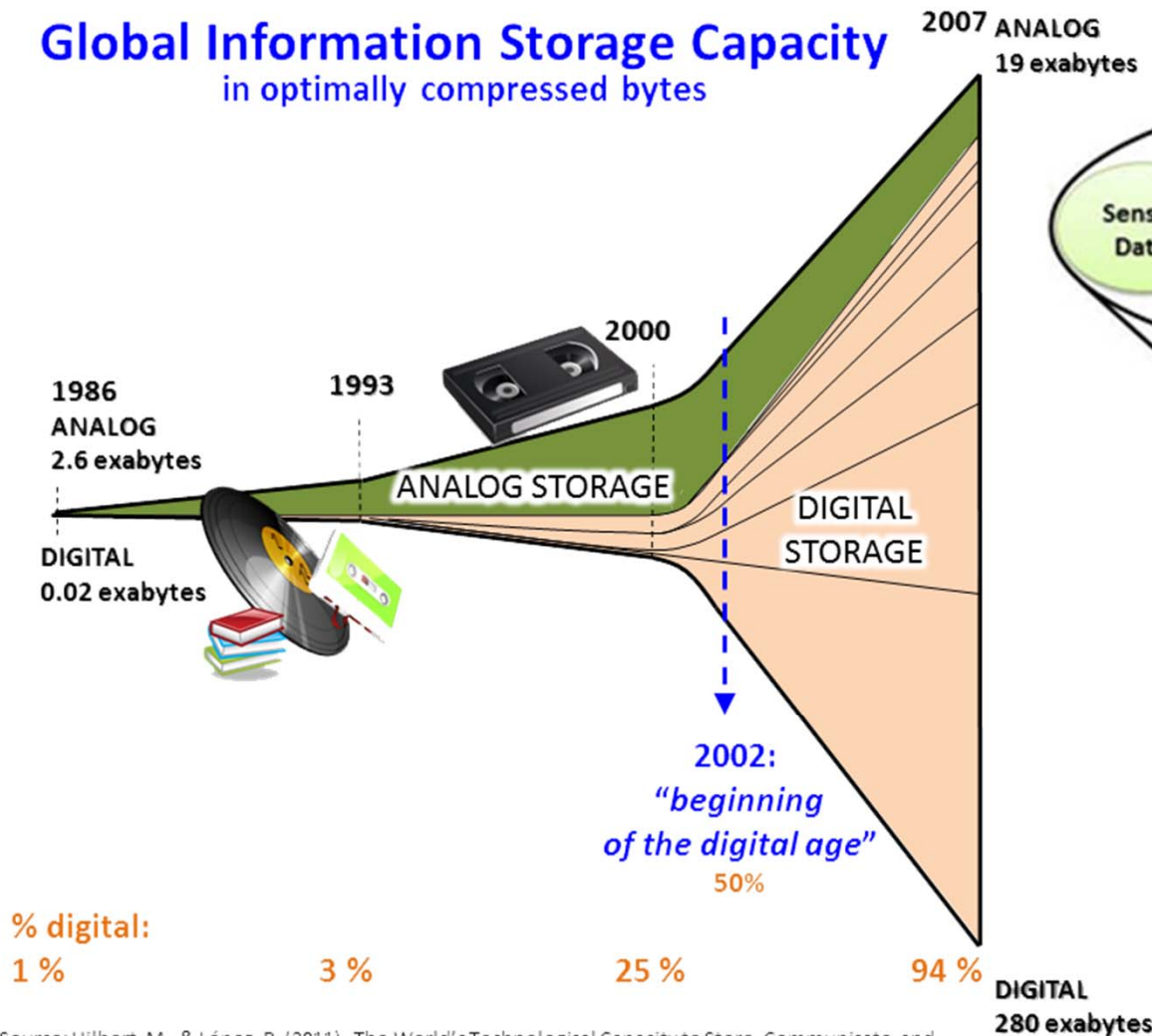
- ScaleDB

“Big data entails a new way of looking at data, thereby **revealing information** which may have been previously difficult to extract of **otherwise obscured**”

– 36<sup>th</sup> International Conference of Data Protection & Privacy Commissioners

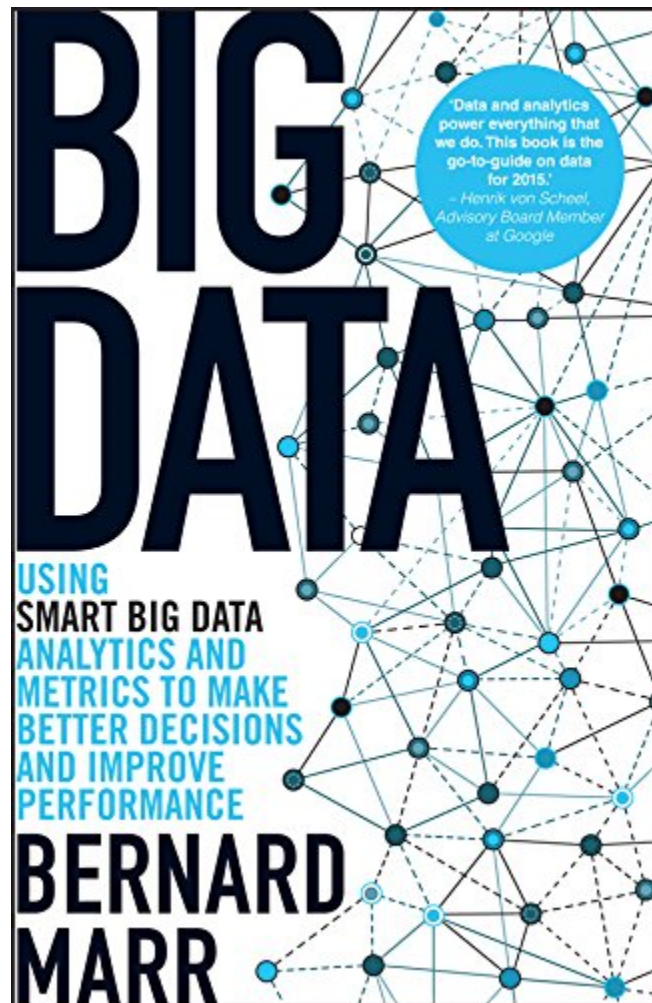
# Distilling the keywords into graphics...

## Global Information Storage Capacity in optimally compressed bytes



Source: <http://www.scaledb.com/big-data.php>

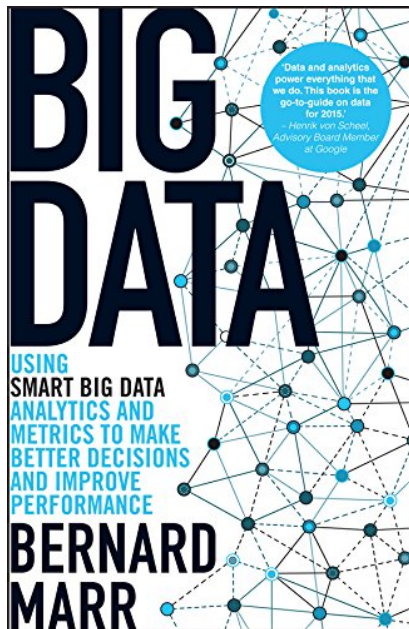
# What do we use big data for?



“Historically, organizations may not have been able to **draw value** from the data that they held, particularly where such data was **unstructured**” – Morrison | Foerster

**Examples of Big Data applications and previously unrealized benefits.**

# What do we use big data for?



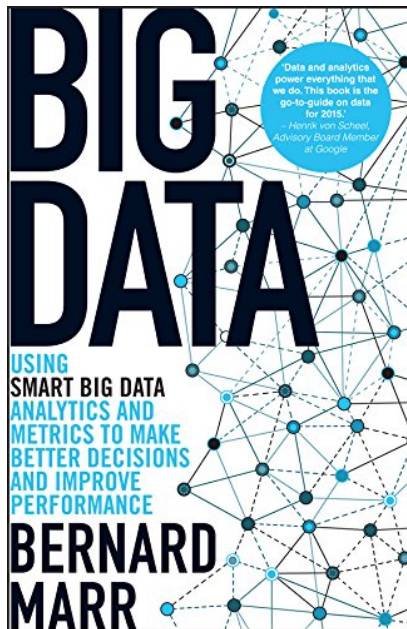
Understanding and Targeting Customers.



**TARGET**

Accurately predict when one of their customers will expect a baby.

# What do we use big data for?



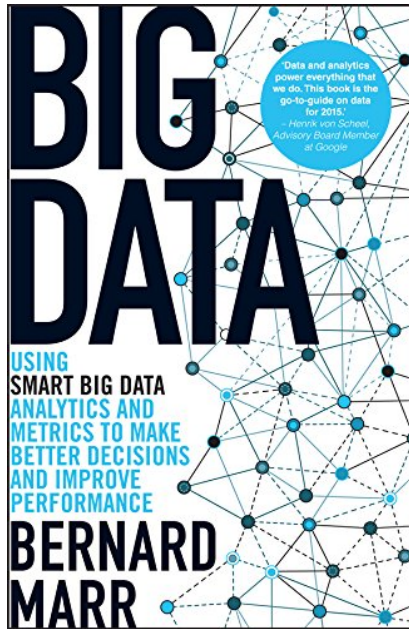
Understanding and Optimizing Business Processes.



WE ♥ LOGISTICS™

GPS and radio frequency identification sensors are used to track goods or delivery vehicles and optimize routes by integrating live traffic data.

# What do we use big data for?



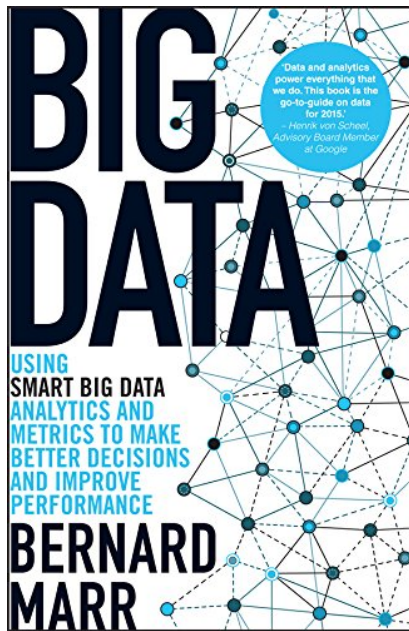
## Improving Healthcare and Public Health.



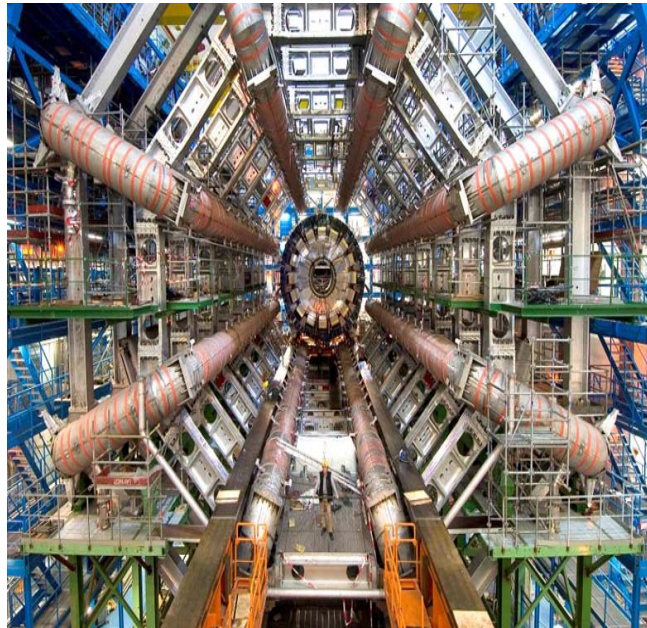
In a NICU, by recording and analyzing every heartbeat and breathing pattern of every baby, the unit was able to develop algorithms that can now predict infections 24-hrs before any physical symptoms appear.



# What do we use big data for?

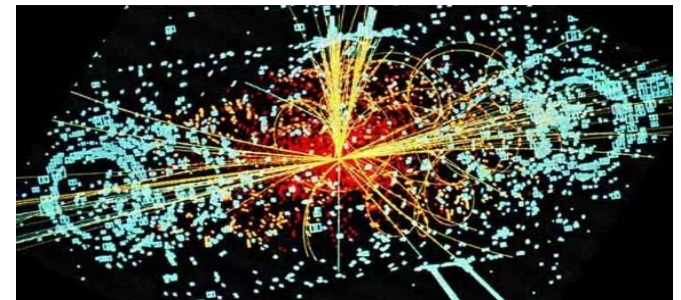


## Improving Science & Research.



### CERN LHC data center:

- 65,000 processors
- 30 petabytes of data
- 150 datacenters worldwide



# Risks and Precautions

“Big Data is not a game played by different rules.”

– 36<sup>th</sup> International Conference of Data Protection & Privacy Commissioners

- Legal risks
  - Purpose limitation
  - Legitimate interest
- Data privacy
  - Anonymization
  - Transparency
- Data Security
  - 3<sup>rd</sup> party data sets
- Data Quality



# Big Data; coming out of the Badlands

“**New technologies** and their subsequent innovations don’t directly cause social change; instead they **create problems** and dilemmas that drive society to **seek new solutions** from a diverse set of choices.”

“Institutional and organizational **structures evolve to solve the problems** and meet the demands of the times.”

“Today’s social ferment from growing global networks is the breeding ground for radical innovations, for good and for ill. Social experimentation with new **disruptive technologies** will be a prominent feature of the next twenty years.”

“New values and structures are not yet firmly in place. In the Badlands, we experience considerable pain and bewilderment as one way of life ends, and we grapple with how to create the next.”

# How does this relate to IH?



Foresight  
Alliance

*See What's Possible*

## AIHA Environmental Scan

Summary Report



January 9, 2014

- Technology and Innovation
- Global Change & Markets
- Changing Society & Workplace
- Policy & Regulation
- Knowledge, Education & Research

# Content Development Timeline

July 2013

- AIHA BOD approved implementation of a content strategy.

Oct 2013

- Environmental scan commissioned.

Jan 2014

- Foresight Alliance report issued.

Feb 2014

- Leadership workshop
- Content strategy discovery instrument

June 2014

- Content strategy developed by Content Portfolio Management Team

Near Future

- Plan implementation

# AIHA Content Portfolio Development

## CONTENT PORTFOLIO RECOMMENDATIONS FY 2015

*These content areas are proposed for AIHA investment and implementation in the next fiscal year. It is likely they will continue to require resources beyond next year. Some projects may require more time and effort with a multi-year development and rollout of new products and services.*

### Ranked high to low

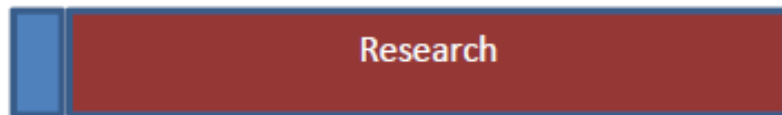
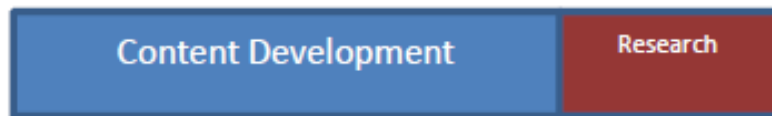
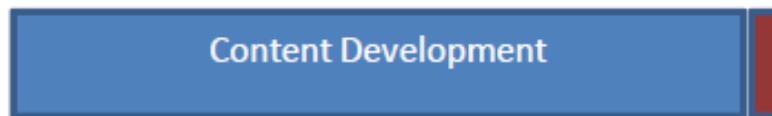
1. Hazard Banding / OEL Process
2. Sensor Technologies
3. Emerging Markets /Global EHS Standard of Care
4. IH Value Strategy/Business Case Development
5. Changing Workforce Demographics / Environment
6. Big Data, Data Management and Interpretation



Source: Barbara Dawson, AIHA Past President, AIHA NER Meeting Presentation 12/5/2014.  
"State of the AIHA/IH Profession, domestically and globally."

# Research & Development

## FOUR CATEGORIZATIONS



## SIX CONTENT RECOMMENDATIONS

1. Hazard Banding/OEL Process
2. Sensor Technologies
3. Emerging Markets/Global EHS Standard of Care
4. IH Value Strategy/Business Case Development
5. Changing Workforce Demographics/Environment
6. Big Data, Data Management & Interpretation

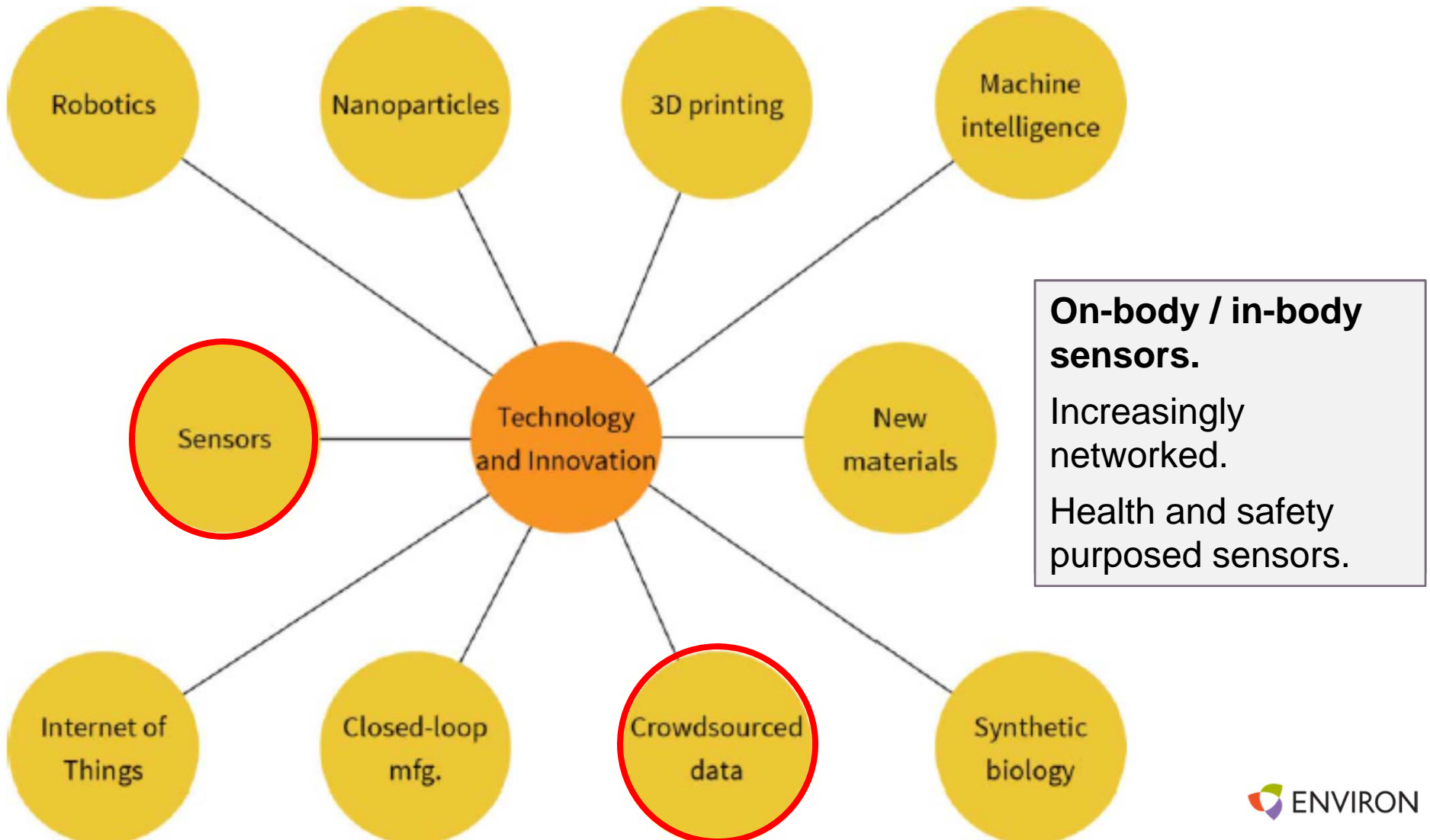
# AIHA's Agenda for "Big Data"



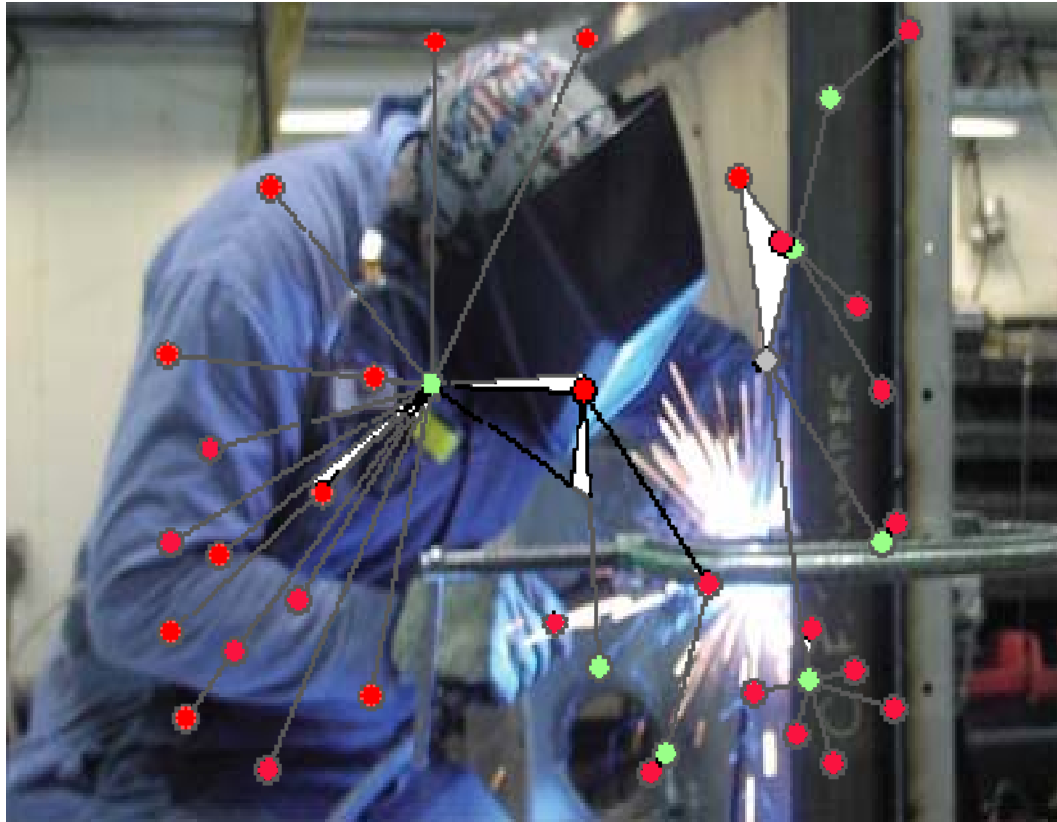
- Research
  - Technical challenges / capabilities
  - Available datasets
  - Potential market interest
- Partnership opportunities: ORC, NIOSH
- Monograph or White Paper
- Volunteer team with Board lead
- Timeframe: Q4 2015 – AIHce 2016



# AIHA Environmental Scan: Technology & Innovation



# IH exposure assessment in the future of big-data analytics



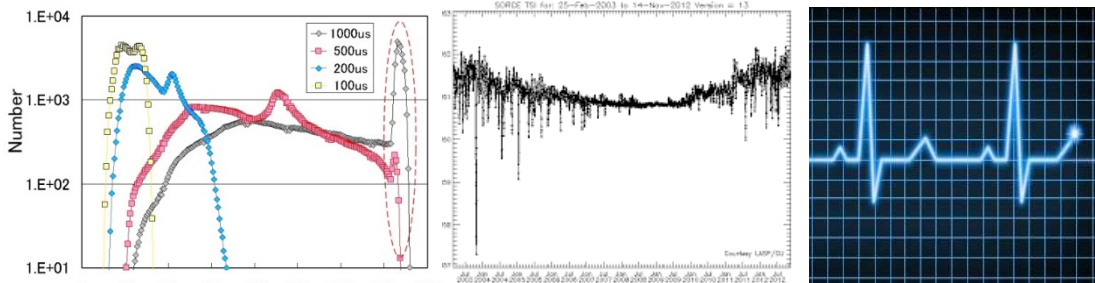
Real-time datalog monitor with particle size differentiation and elemental analysis.

Virtualized tracking of worker movement patterns into/out of fume plume and NF:FF zones.

Networked smart-welder reports:  
- arc-time, wire feed rate  
- voltage/current settings.

Worker biometrics on-body  
- heartrate, respiration rate, and stress sensors.

Plume migration / LEV capture efficiency modeling via interpolative video.



# Big Data will...

- Provide the ability to dig into data and answer questions that were not originally envisioned
- Alter the way we define and evaluate “acceptable risk”
- Allow for more personalized risk assessments



# As you continue to listen to the panelists...

- Think about how the age of “Big Data” will influence:
  - Developing and validating models
  - Defining risk acceptability criteria
  - Deriving site-specific risk-based exposure criteria
  - Communicating probability & risk concepts





# Thank you. Questions?

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# References

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