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Storage & Compute at the Edge

Chris Bergey

VP, Embedded Solutions
Western Digital Corporation

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Forward-Looking Statements
Safe Harbor | Disclaimers

This presentation contains forward-looking statements that involve risks and uncertainties, including, but not limited to, statements regarding our addressable market, our product and technology positioning and compute platforms, the anticipated benefits of our new technologies, executing on our integrated strategic plans, realizing our strategic imperatives, including our embedded flash devices and storage technologies. Forward-looking statements should not be read as a guarantee of future performance or results, and will not necessarily be accurate indications of the times at, or by, which such performance or results will be achieved, if at all. Forward-looking statements are subject to risks and uncertainties that could cause actual performance or results to differ materially from those expressed in or suggested by the forward-looking statements.

Additional key risks and uncertainties include the impact of continued uncertainty and volatility in global economic conditions; actions by competitors; difficulties associated with go-to-market capabilities; business conditions; growth in our markets; and pricing trends and fluctuations in average selling prices. More information about the other risks and uncertainties that could affect our business are listed in our filings with the Securities and Exchange Commission (the "SEC") and available on the SEC's website at www.sec.gov, including our most recently filed periodic report, to which your attention is directed. We do not undertake any obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future developments or otherwise, except as otherwise required by law.

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MOBILE

COMPUTE

AUTO

- **Global leader in Storage –** Revenue $18B in 2017

- **Global leader in technology –** 13,500 active patents worldwide

- **Global leader in product and solutions portfolio**
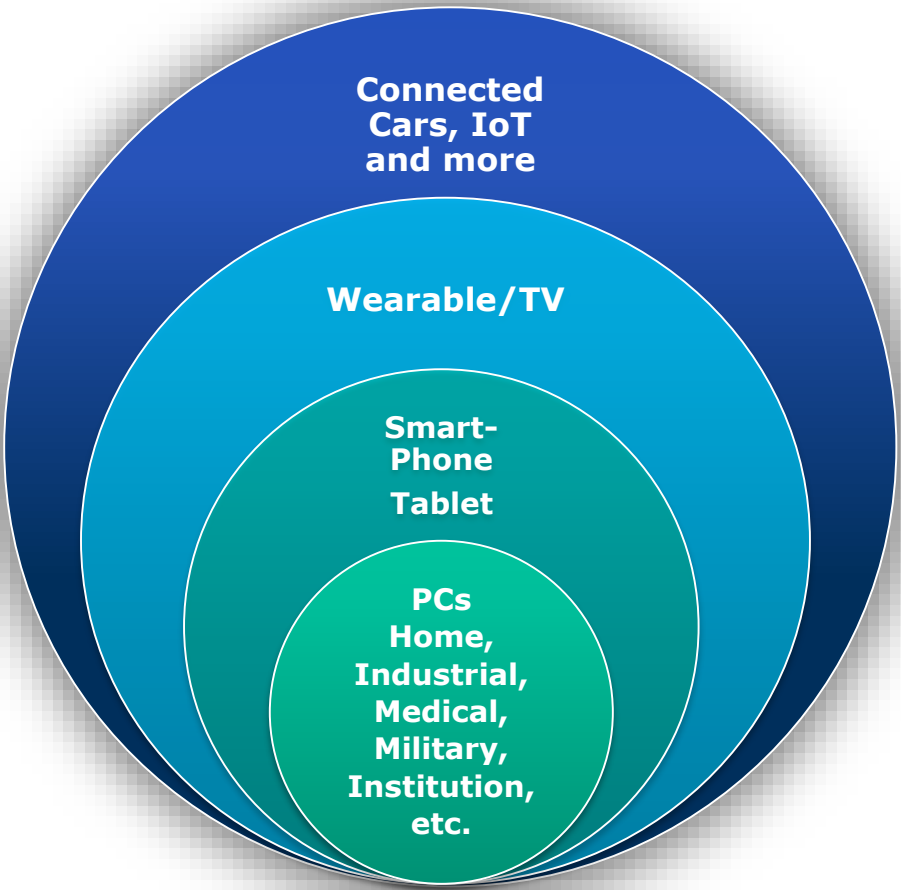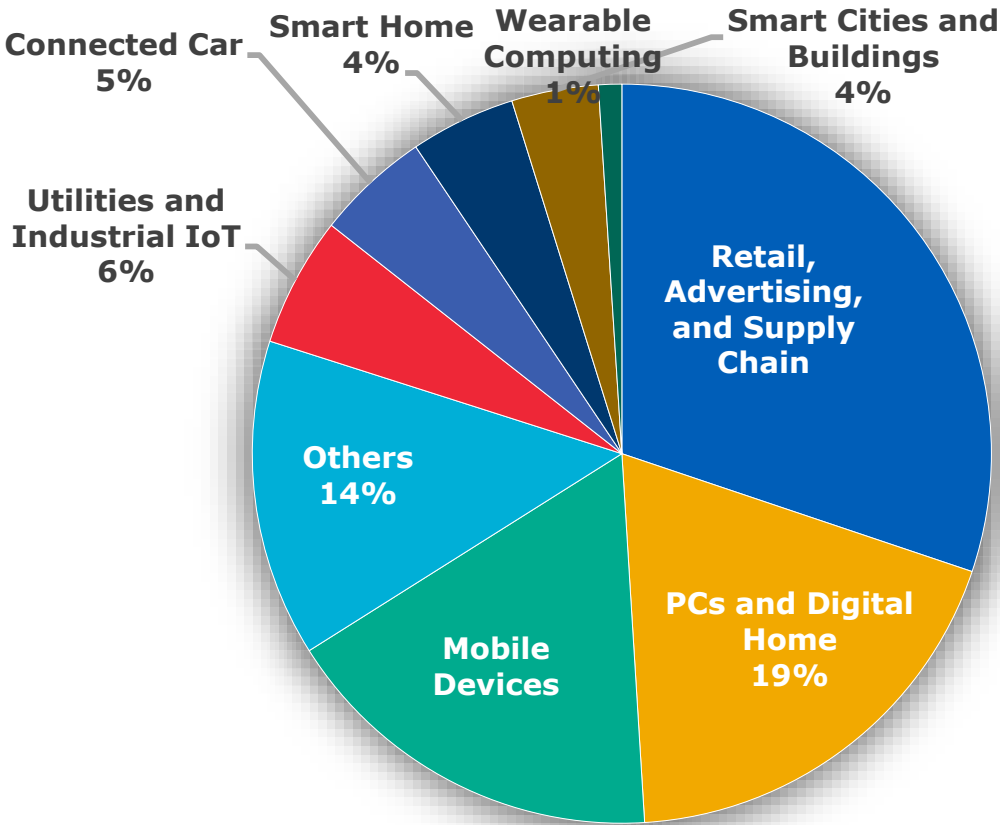
- **Enabling IoT** – from Edge to Core

INDUSTRIAL

HOME

DATACENTER

50 Billion Connected Devices by 2020
3.6 devices connected to the internet per person
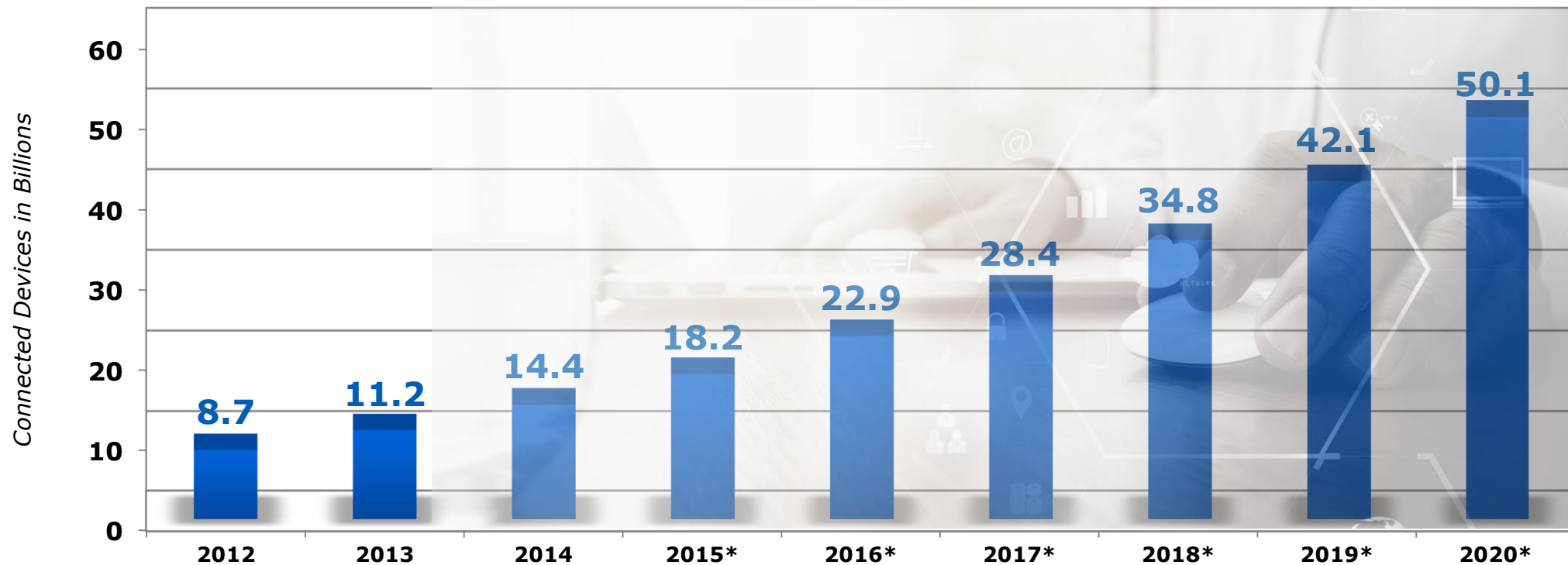

Connected device changes over the years

- Connected Cars, IoT and more
- Wearable/TV
- Smart-Phone Tablet
- PCs Home, Industrial, Medical, Military, Institution, etc.

Percentage of Connected device by 2020

- Connected Car 5%
- Smart Home 4%
- Wearable Computing 1%
- Smart Cities and Buildings 4%
- Utilities and Industrial IoT 6%
- Retail, Advertising, and Supply Chain
- Others 14%
- PCs and Digital Home 19%
- Mobile Devices

Source: ABI Research Internet Everything Market Tracker.

50 Billion Connected Devices by 2020
3.6 devices connected to the internet per person

Connected Devices in Billions

Year	Devices
2012	8.7
2013	11.2
2014	14.4
2015*	18.2
2016*	22.9
2017*	28.4
2018*	34.8
2019*	42.1
2020*	50.1

Source: ABI Research Internet Everything Market Tracker. Q1 2017.

Data from Billions of Connected Devices by 2020

0.00005% of generated data transmitted to the Cloud

67 EB

Only 4%

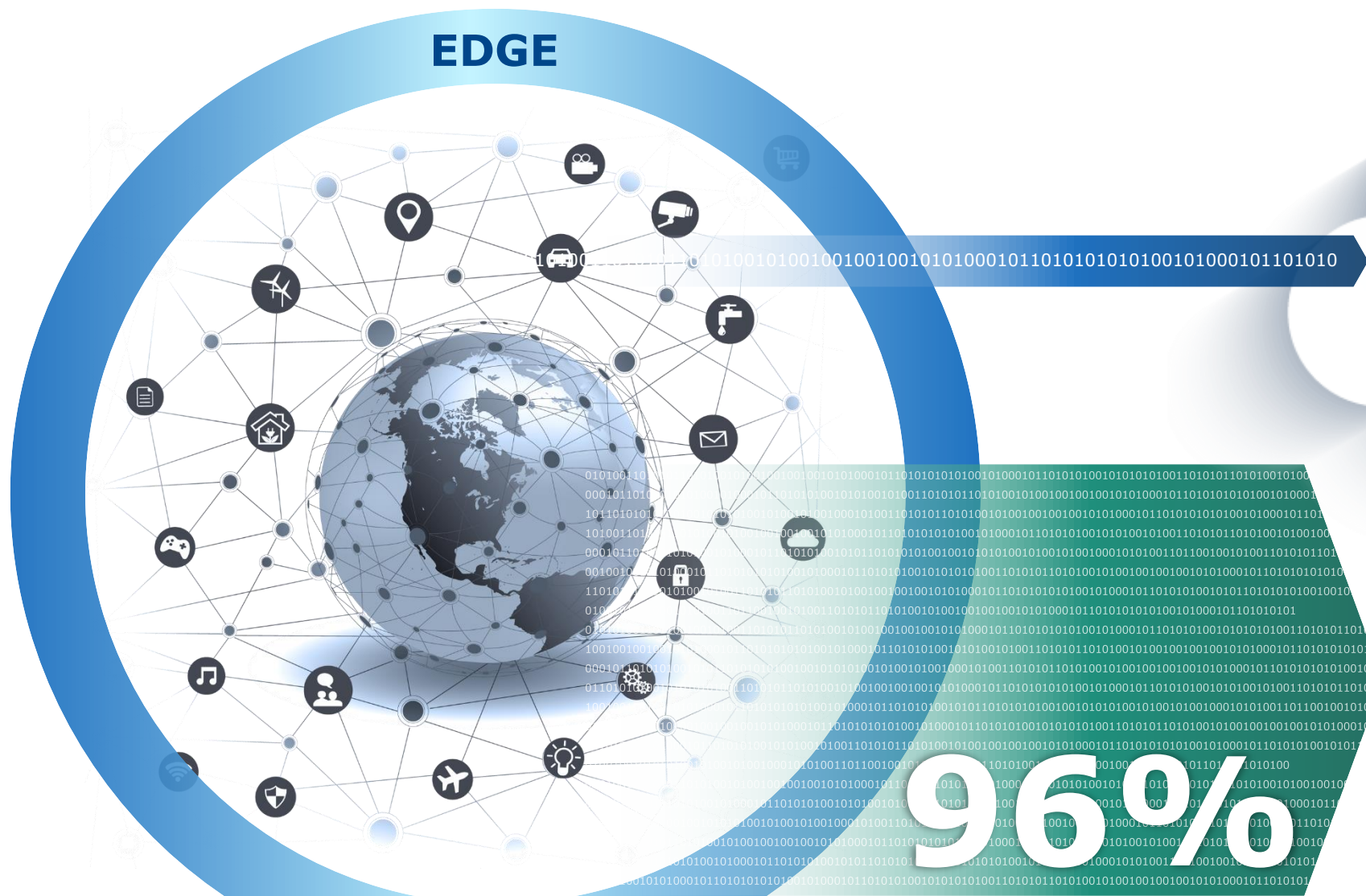**Out of data _captured_ by IoT devices will be transmitted to the Cloud**

0.0013% of generated data **captured**

1.5 ZB

100% of data **generated** by IoT

114.7 YB

(114,700 ZB)

Source: ABS Research Edge Analysis in IoT – 1Q 2017

EDGE

Only 4%
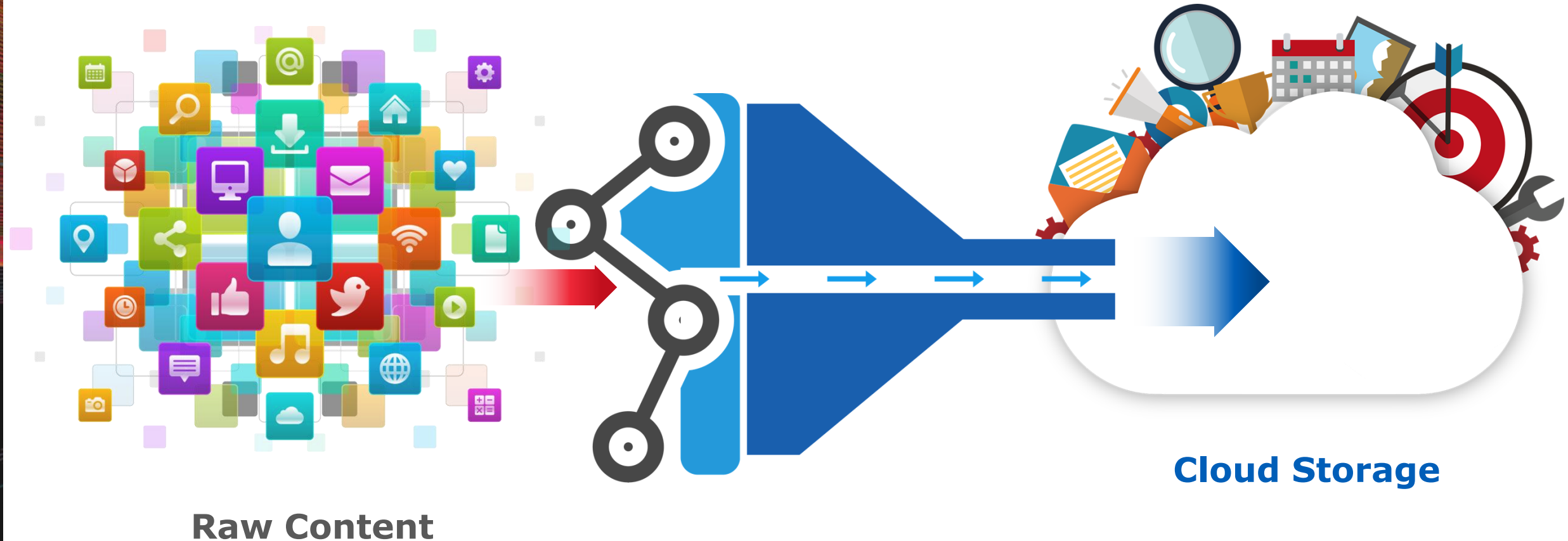of data captured by IoT devices will be transmitted to the Cloud

96%

114.7 Yottabyte
of data generated by IoT

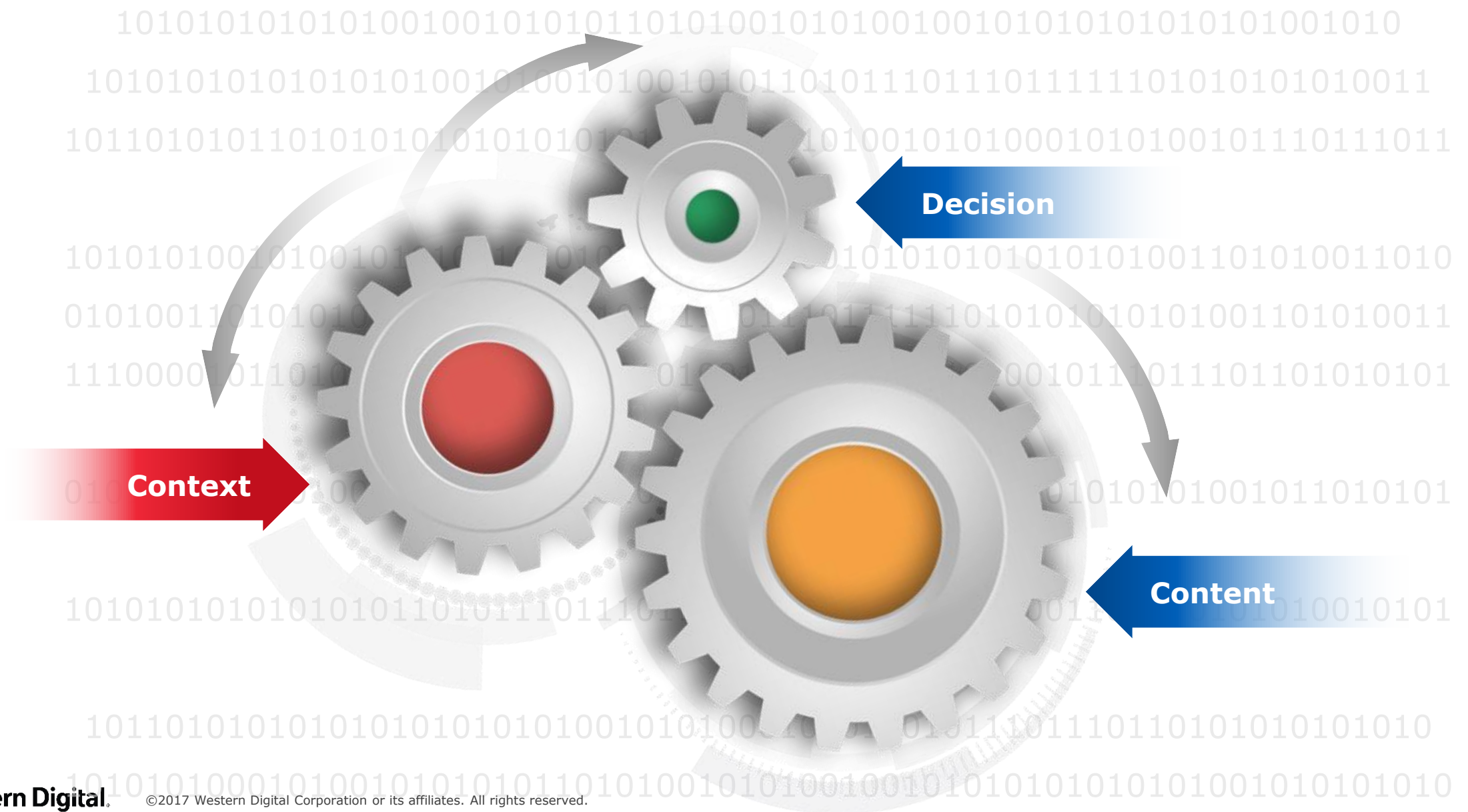of the data potential can be cultivated and monetized

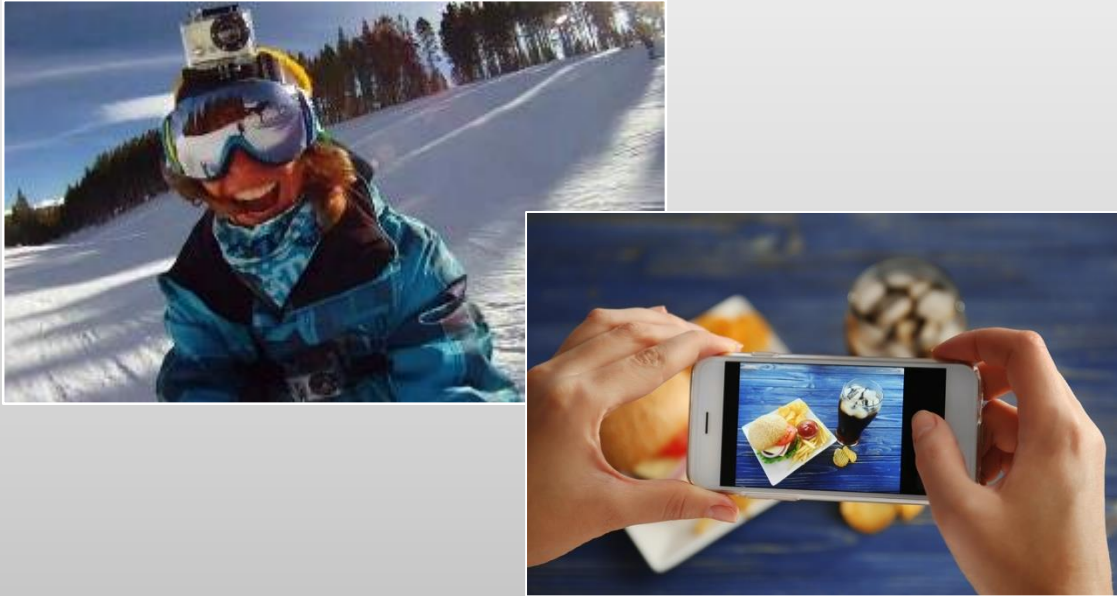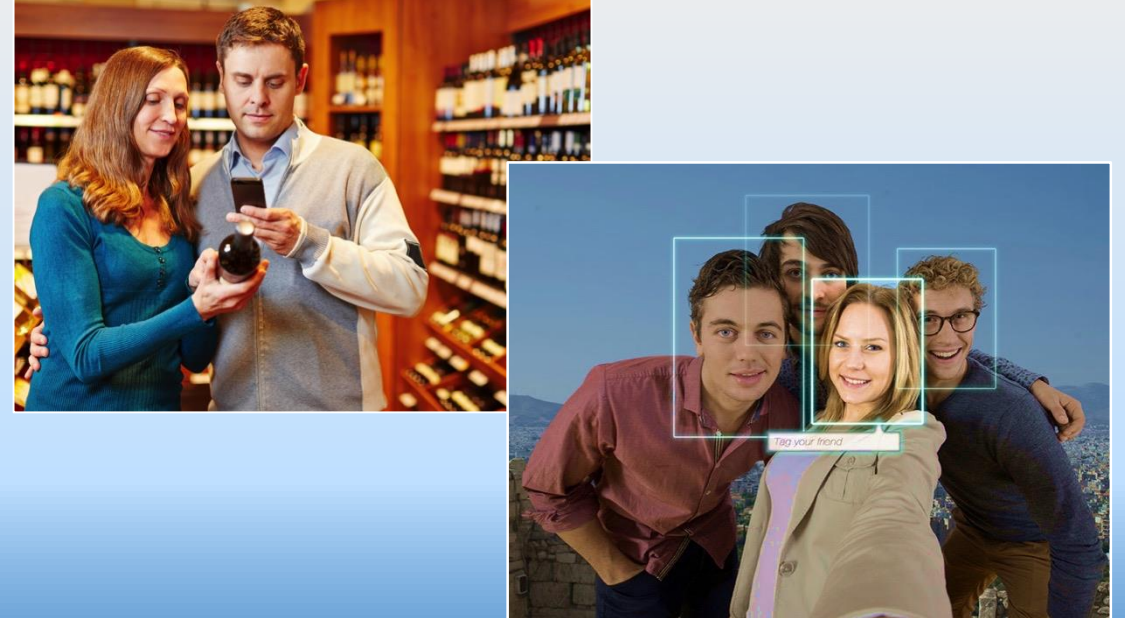# RAW Data at the Edge vs. Metadata in the Cloud

Raw Content

Cloud Storage

Context Complements Content

What is Context?

Yesterday

Today
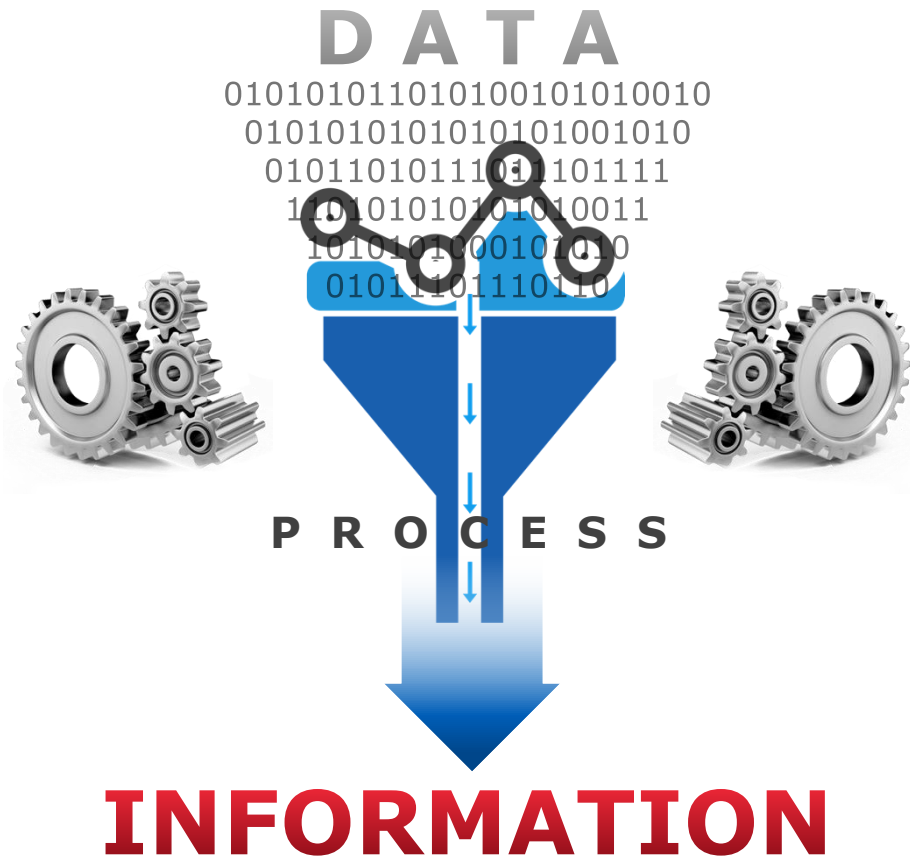
- Simply capture, compress and store video images
- No intelligent data processing at the edge

- Real time Face recognition, pattern matching
- Check pricing and order online
- Metadata, object on the fly

But Context is Hard . . .

D A T A

0101010110101001010100010
0101010101010101001010
0101101011101101111
10101010101010011
...10010...0
0101101110110

P R O C E S S

INFORMATION

Indoor Navigation

Self Driving Vehicle

Requires significant data and compute resources . . .

Context Provides Intelligence

- Verify the person for access approval
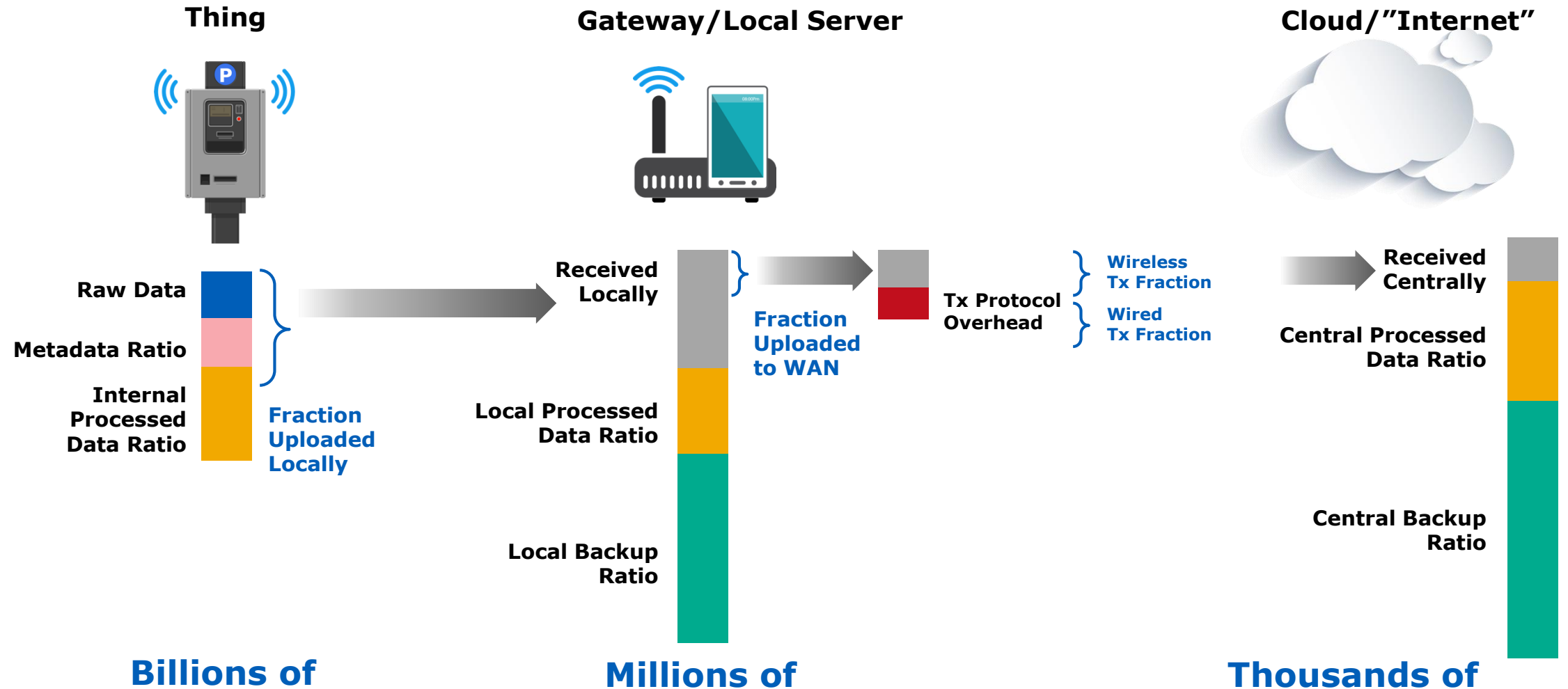- Keep data for weeks and month for security purpose

- Data analysis, new merchandise increase revenue by 30% since last week.
- Dwell time increase by 25% since last week

- Measure the effectiveness of advertisement in public transit
- Collect data to analyze the gender and average age of viewer.
- Average viewing time

The Shape of Future Data
DATA Transmission, Generation and Storage

Thing

Gateway/Local Server

Cloud/"Internet"

Raw Data

Metadata Ratio

Internal Processed Data Ratio

Fraction Uploaded Locally

Received Locally

Fraction Uploaded to WAN

Local Processed Data Ratio

Local Backup Ratio

Tx Protocol Overhead

Wireless Tx Fraction

Wired Tx Fraction

Received Centrally

Central Processed Data Ratio

Central Backup Ratio

Billions of

Millions of

Thousands of

Source: Gartner Forecast IoT Data Storage Capacity 2013-2020

Delivering Storage Solutions from Edge to Core
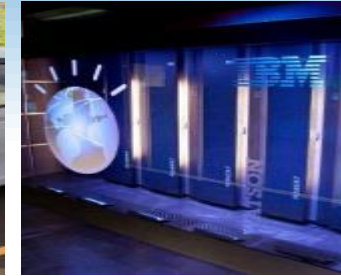

| Home | City | Medical | Industrial | Autonomous Vehicles | Machine Learning | Mobile |

- Drastic advances in computing and storage are not only happening in the cloud, i.e. 85% of stored data will be at the edge by 2020
- Winning solutions will balance their architectural decisions from the edge device to the heart of data center
- Adding context to data, making data more interesting and useful for users is a key opportunity and driver of value creation.

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