New Information Governance Challenges

Greater Sacramento Capitol Chapter — ARMA

Welcome — City of SACRAMENTO

March 21st, 2017

ignpower™

By Bassam Zarkout

About Bassam Zarkout

❑ Experience in IG, RM, ECM, BPM (25 years)
- RSD: CTO, Chief Strategy Officer
- IGnPower: Founder
- IG prototype research with US DoD
- Design and develop IG/RM products/solutions
  - eManage ByteQuery design, DoD 5015.2
  - GLASS creative design, patents
- IG projects: Government, Banking, Automotive, Utilities, etc.

❑ Experience in Internet of Things (IoT)
- IoT, Industrial IoT, Smart Cities
- Artificial Intelligence
- Industrial Internet Consortium

❑ Public Speaking on IG, RM, IoT:
- ARMA, MER, AIIM, IGI, ThingsExpo, etc.
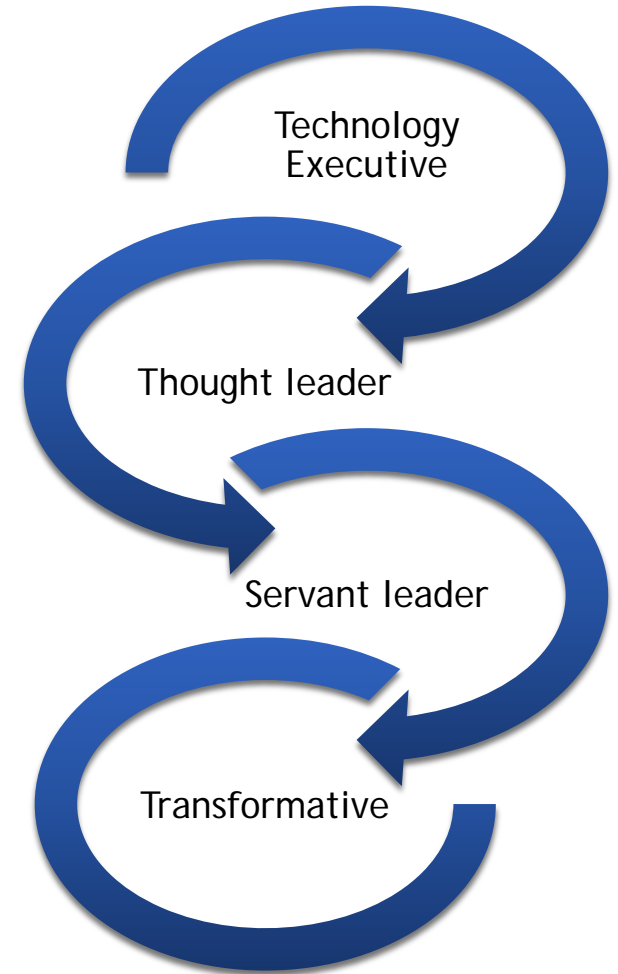
Technology Executive

Thought leader

Servant leader

Transformative

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New Information Governance Challenges

Corporate Information Assets
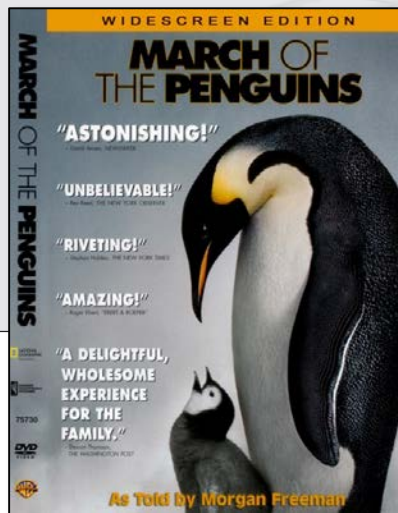
Internet of Things Data

Artificial Intelligence

Discussion

Corporate Information Assets

Benefits of Digitalization

- March towards digitalization of business has delivered significant benefits to organizations
- Corporate information is "lifeblood of organization"… hence the <u>Information Asset</u>

Challenges of Digitalization

- Exploding volume of corporate information created, stored and consumed
  - Exabytes, Zettabytes and Yottabytes
  - Curiosities few years ago… reality today
- Information landscape increasingly complex
  - Human-created documents and emails, high-volume reports from business systems, social media content, IoT data
- Information scattered across many systems
  - Many platforms
  - On-premises and cloud
- Growing Data Residency issues
  - Differences in regulatory and legal requirements across jurisdictions

A new term has emerged:
The Information Asset

# Corporate Information Assets: Lifecycle

| Lifecycle policy based on…	Retention during lifecycle…	At end of life of asset…
• Business requirements • Operational requirements • Regulatory requirement • Legal requirements	• Maintain integrity, accessibility and compliance with privacy • Duration may be decades long • Lifecycle may be longer than lifecycle of systems used to create it and store it	• Decision needed re what actions to take • Regulations and laws may require disposition of asset

Activity

Regulatory Filing   Analytics   Regulatory Filing

Disposal

day   month   year   decade   Time
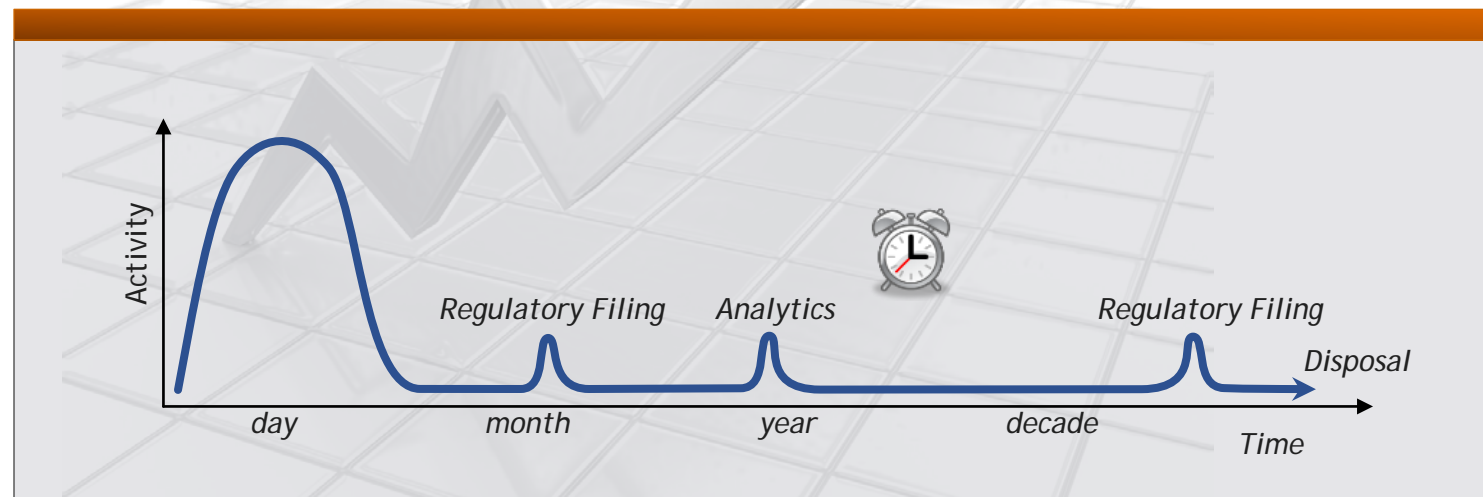
Information Governance (IG)

- **Information Governance***: term used in industry for "looking after" information
  - Splitting hair? "Looking after" or "Take care of"?

- Need sustainable IG program with clear objectives:
  - Reduce cost of ownership of corporate information
  - Reduce legal and regulatory compliance risks associated with owning this information
  - Increase business value of this information

Information Governance Program

Risk	Cost	Value
Reduce cost of ownership of corporate information	Reduce legal and regulatory compliance risks associated with owning information	Increase business value of information

* Different from the governance of systems that generate information.
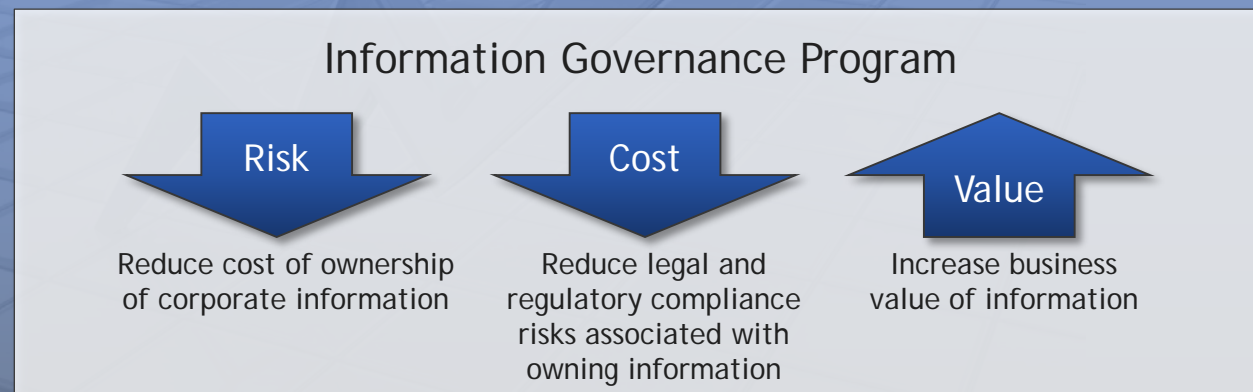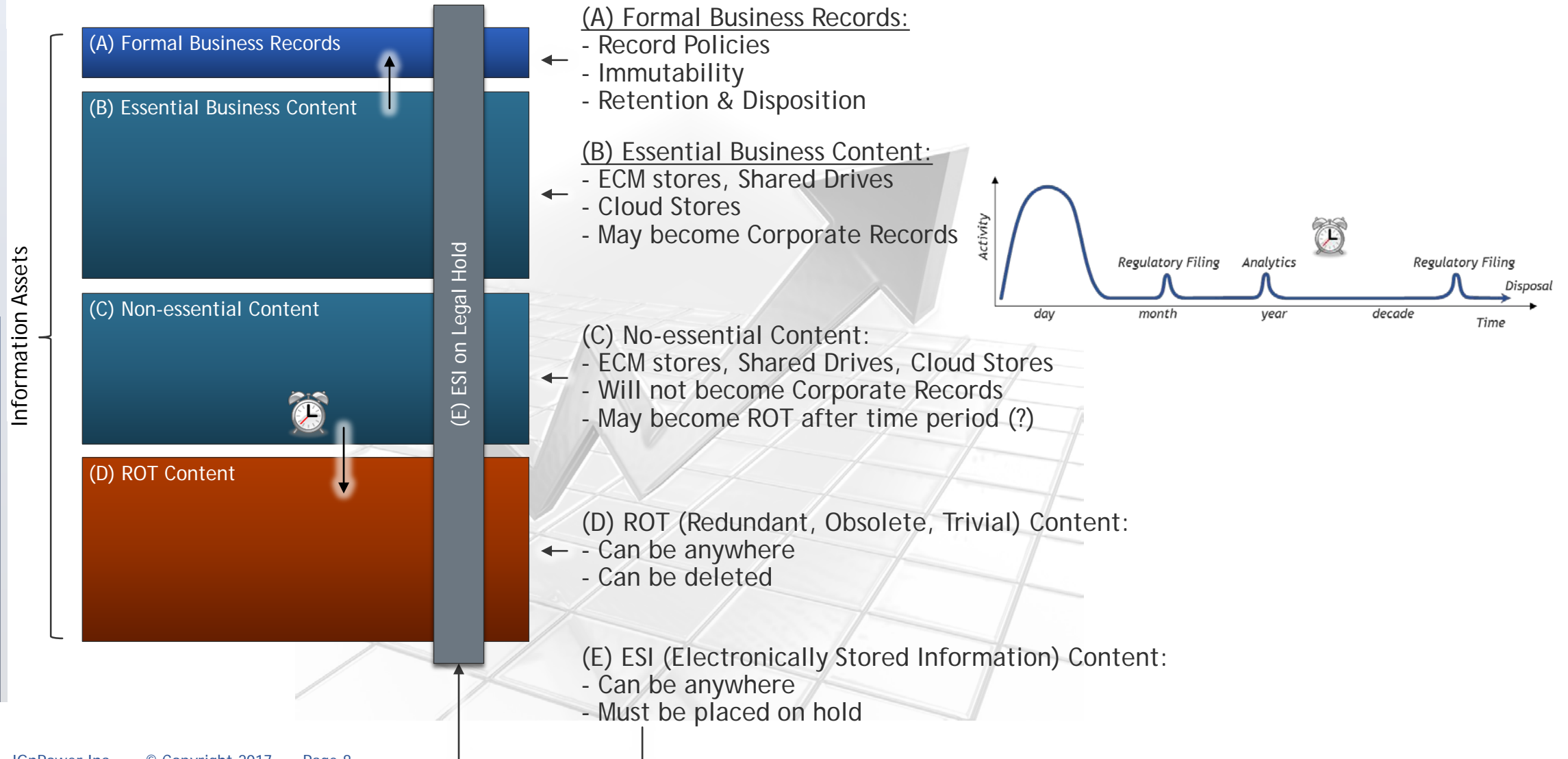
Growing Information Governance Debt

Growing gap between <u>increasing volumes of Information Assets</u> and <u>limited amounts of governance controls</u> being applied to them is resulting in an **Alarming IG Debt**

Information Assets in the Organization

(A) Formal Business Records

(B) Essential Business Content

(C) Non-essential Content

(D) ROT Content

(E) ESI on Legal Hold

Information Assets

(A) Formal Business Records:
- Record Policies
- Immutability
- Retention & Disposition

(B) Essential Business Content:
- ECM stores, Shared Drives
- Cloud Stores
- May become Corporate Records

(C) No-essential Content:
- ECM stores, Shared Drives, Cloud Stores
- Will not become Corporate Records
- May become ROT after time period (?)

(D) ROT (Redundant, Obsolete, Trivial) Content:
- Can be anywhere
- Can be deleted

(E) ESI (Electronically Stored Information) Content:
- Can be anywhere
- Must be placed on hold

Activity

Regulatory Filing   Analytics   Regulatory Filing

day   month   year   decade   Disposal   Time
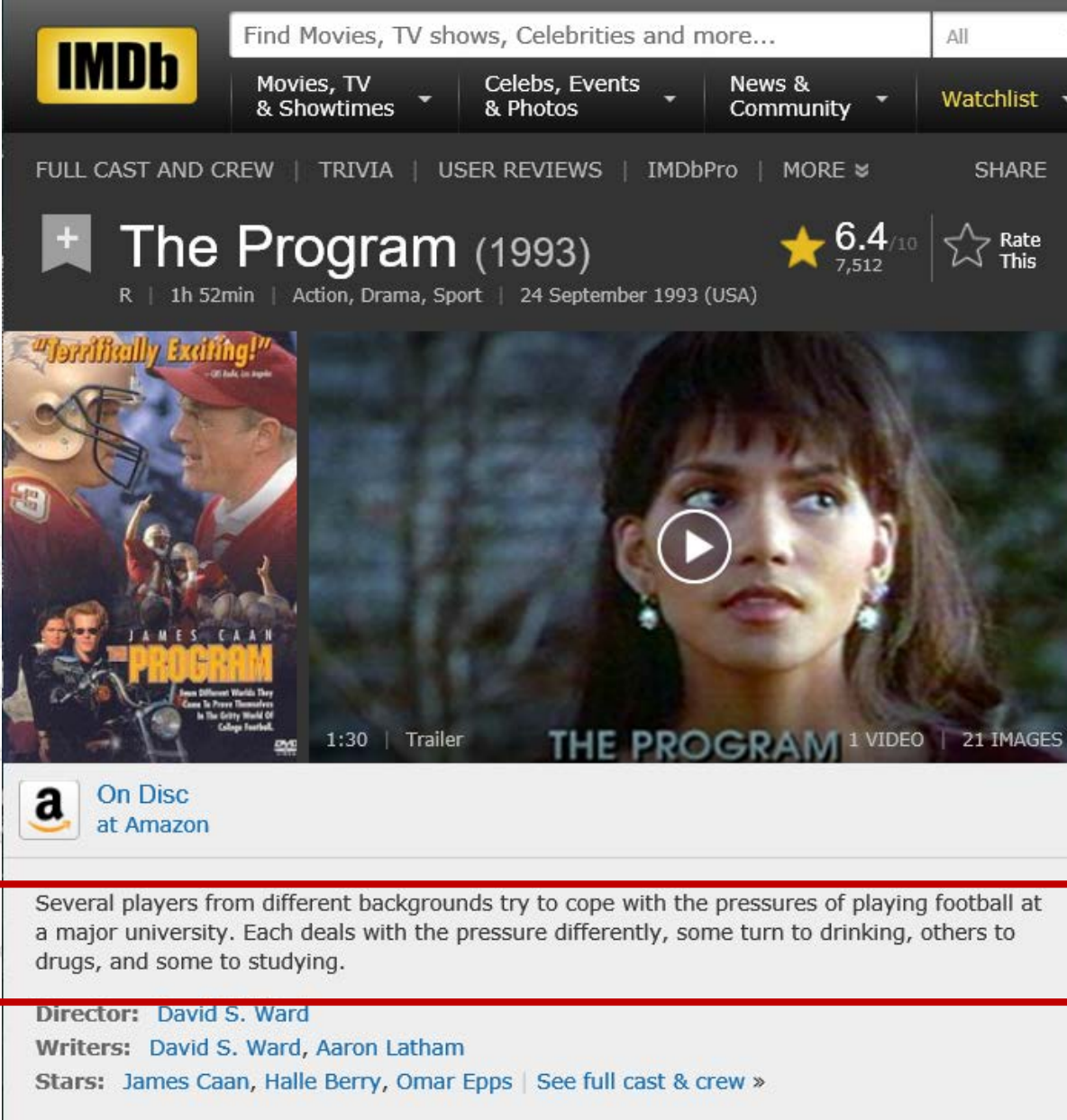
The IG Program

The "Program" Strategy
Vision
Mission Statement
Mandate
Culture

Sponsorship
Executive Level
CxO Leadership
Budget

Operational
Steering Committee
Roadmap
Sustainable

Find Movies, TV shows, Celebrities and more...   All

IMDb

Movies, TV & Showtimes   Celebs, Events & Photos   News & Community   Watchlist

FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE ≽   SHARE

The Program (1993)
★ 6.4/10 7,512   ☆ Rate This
R | 1h 52min | Action, Drama, Sport | 24 September 1993 (USA)

"Terrifically Exciting!"

1:30 | Trailer   THE PROGRAM   1 VIDEO | 21 IMAGES

a On Disc at Amazon

Several players from different backgrounds try to cope with the pressures of playing football at a major university. Each deals with the pressure differently, some turn to drinking, others to drugs, and some to studying.

Director: David S. Ward
Writers: David S. Ward, Aaron Latham
Stars: James Caan, Halle Berry, Omar Epps | See full cast & crew ≫

Engaged Stakeholders
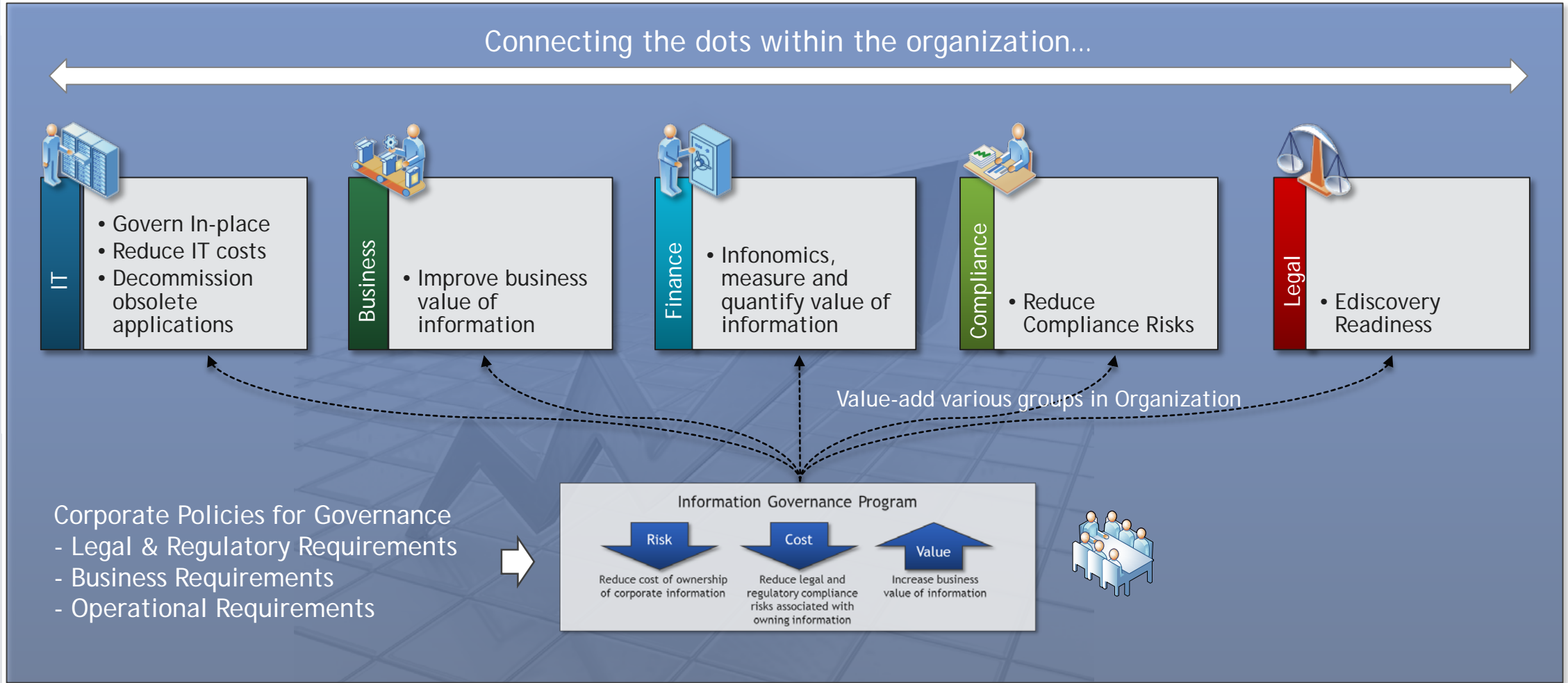IT
Business
Finance
Compliance
Legal
Other

Add value to internal groups
Connect the dots
RACI

Enforcement
Processes
Reporting
Litigation Support
Technology Deployment
Integration

The IG Program... Adds Value and Connects the Dots

Connecting the dots within the organization...

IT
- Govern In-place
- Reduce IT costs
- Decommission obsolete applications

Business
- Improve business value of information

Finance
- Infonomics, measure and quantify value of information

Compliance
- Reduce Compliance Risks

Legal
- Ediscovery Readiness

Value-add various groups in Organization

Corporate Policies for Governance
- Legal & Regulatory Requirements
- Business Requirements
- Operational Requirements

Information Governance Program

Risk — Reduce cost of ownership of corporate information

Cost — Reduce legal and regulatory compliance risks associated with owning information

Value — Increase business value of information

Challenges facing Information Governance

Despite its short history, IG has had its fair share of challenges...

IG practices still emerging...

- Lack of maturity in discipline
- Lack of maturity in organizations

Most IG programs not well established...

- Long on vision
- Short on execution
- Lack of effective executive sponsorship

Unclear who is in charge...

- Most CIOs focused on infrastructure
- Records Managed stuck in the past
- Business Leaders focused on business
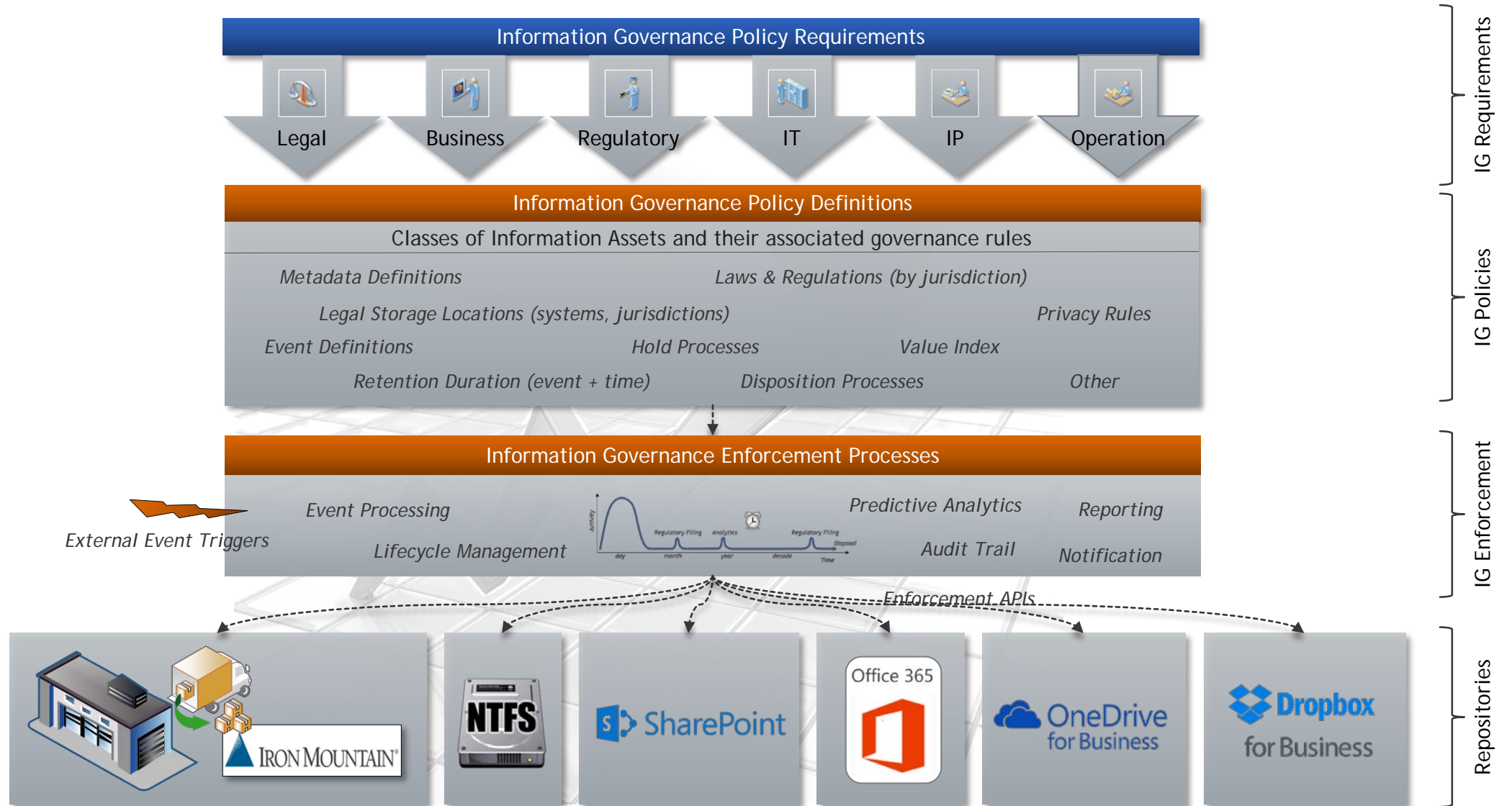- Tech budgets moving away from IT

Outcomes so far... not so great

Slow adoption of IG practices

Increased costs and risks

New CxO title needed?
- CDO: Chief Digital Officer
- CDO: Chief Data Officer
- CIGO: Chief IG Officer

IG Requirements → Policies → Enforcement → Repositories

IG Requirements

Information Governance Policy Requirements

| Legal | Business | Regulatory | IT | IP | Operation |

IG Policies

Information Governance Policy Definitions

Classes of Information Assets and their associated governance rules

Metadata Definitions   Laws & Regulations (by jurisdiction)

Legal Storage Locations (systems, jurisdictions)   Privacy Rules

Event Definitions   Hold Processes   Value Index

Retention Duration (event + time)   Disposition Processes   Other

IG Enforcement

Information Governance Enforcement Processes

External Event Triggers

Event Processing   Predictive Analytics   Reporting

Lifecycle Management   Audit Trail   Notification

Enforcement APIs

Repositories

IRON MOUNTAIN

NTFS

SharePoint

Office 365

OneDrive for Business

Dropbox for Business

New Information Governance Challenges

Corporate Information Assets

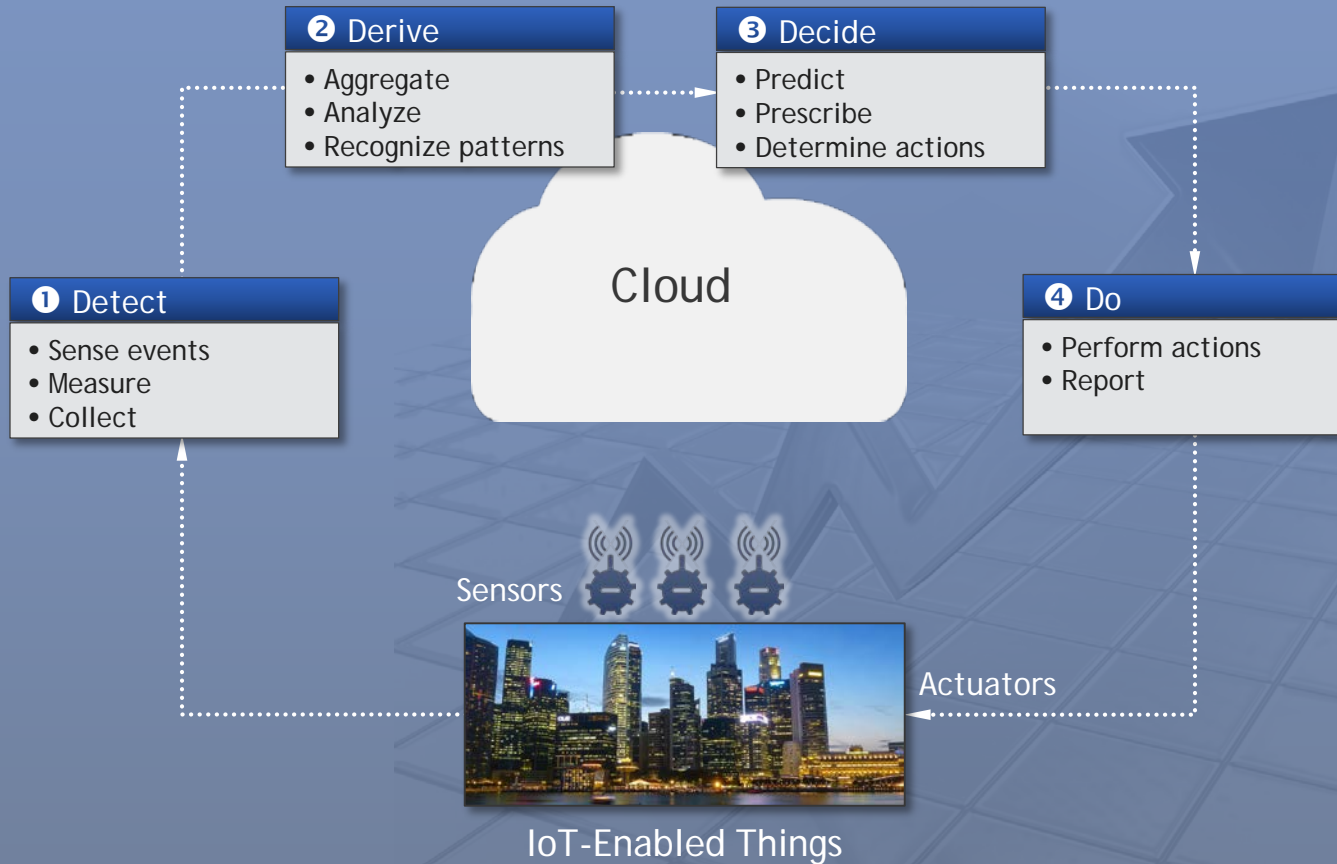Internet of Things Data

Artificial Intelligence

Discussion

The Evolution of the Internet of X

Documents	Transaction Data	Social Media Data	Device Data
Internet of Documents	Internet of Commerce	Internet of People	Internet of Things

What is IoT?

The 4 Ds of IoT

❷ Derive
- Aggregate
- Analyze
- Recognize patterns

❸ Decide
- Predict
- Prescribe
- Determine actions

Cloud

❶ Detect
- Sense events
- Measure
- Collect

❹ Do
- Perform actions
- Report

Sensors

Actuators

IoT-Enabled Things
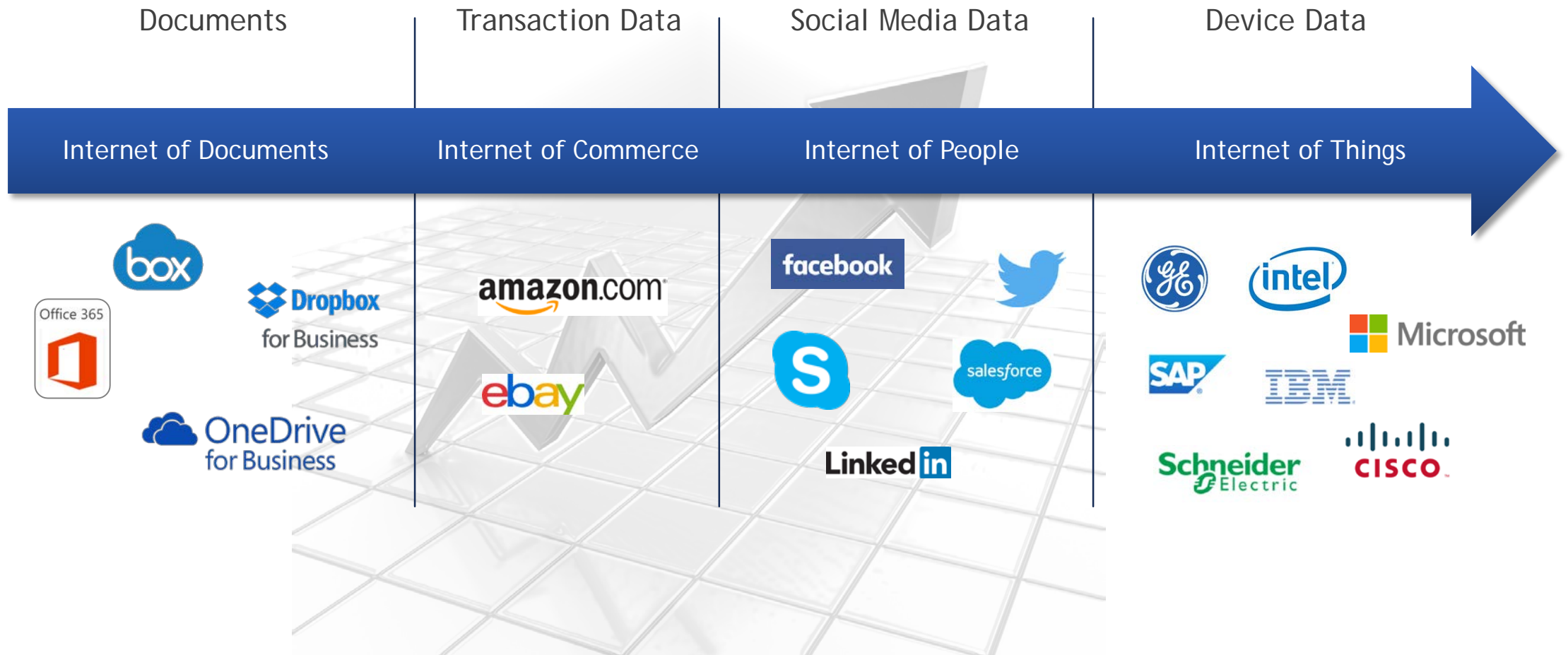
What is IoT

Exploit operational data generated by Internet-connected smart objects in order to:
- Gain insight about their operation
- Produce better outcomes

Better Outcomes

- Enhance productivity
- Create new business models
- Eliminate unplanned maintenance
- Increase revenue
- Other…

Lots of hype around IoT... BUT lots of reality too...

IoT impact on the market is significant, real and it's here!

| Gartner	McKinsey&Company	GE	Microsoft	CISCO
• IoT mainstream in 2020 • IoT one of top 10 strategic technologies for Government • Connected "things: • 4.9 billion in 2015 • 25 billion in 2020	• Potential maybe higher than some of the hype around IoT • Hard to capture value • Benefits require capital and investment in business process innovation • Value in 2020: $4-11t	•Industrial Internet may add $10-15t to world economy •7 connected devices per capita worldwide by 2020 •GE Predix Platform: $6b in 2016, $15b in 2020 •Aviation: •Avoid unscheduled maintenance, save fuel, improve scheduling... •Manufacturing: •Monitor machine health, optimize maintenance...	•Economic impact: $11.1t by 2025 •Capture/analyze data to improve business results •Monitor assets to improve efficiencies •Drive operational performance •Enable innovation •Transform business by using advanced data analytics •Create new business models and revenue streams	•Internet of Everything (IoE): $14.4 trillion Value at Stake 2013-2022 •Asset utilization $2.5t •Productivity $2.5t •Supply chain $2.7t •Customer UX $3.7t •Innovation $3.0t •Technology trends: •Cloud, mobile, Big Data, CPU power, etc. •Security and privacy policies are critical

Sample IoT Use Cases

Use Cases for IoT
- Manage Asset Performance
- Improve Safety
- Enable New Business Models
- Improve Energy Efficiency
- Monitor Quality
- Enhance Customer Access

1. Detect
- Sense events
- Measure
- Collect

2. Derive
- Aggregate
- Analyze
- Recognize patterns

3. Decide
- Predict
- Determine actions

4. Do
- Perform actions
- Report

Sample Use Cases

Japan's National Institute of Advanced Industrial Science and Technology designed little drones.

Ultimately drones will be able to crawl inside plants.

NFC-Enabled 'Connected Bottles' lovelymobile.news/jameson-u...
#technology #iot #digital #beverage @AgencyOfThings @pearlfisherlive #stpatricksday
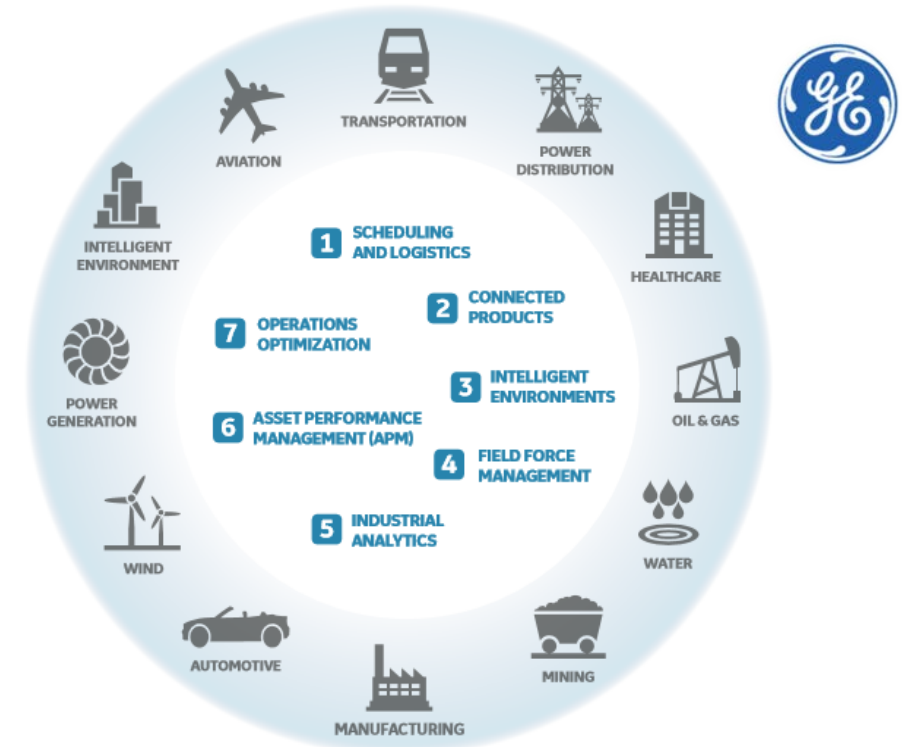
1 Scheduling & Logistics
Increase asset utilization with predictive analytics, improving performance, and efficiency that can result in lower repair costs.

2 Connected Products
Replace the current "break-fix" model with a "predict-and-prevent" services approach by making machines software defined.

3 Intelligent Environments
Tap into LED solutions and sensors in cities and buildings to collect and analyze data and enhance everyone's experience.

4 Field Force Management
Give workers the machine data, expertise, and processes they need to make repairs and upgrades more effective.

5 Industrial Analytics
Monitor asset health to identify problems, then use predictive and prescriptive analytics to boost productivity.

6 Asset Performance Management (APM)
Achieve new levels of performance, reliability, and availability throughout the life cycle of all assets (See Spotlight section for more on APM).

7 Operations Optimization
Use key insights on an enterprise-wide scale to resolve operational issues, drive productivity, and increase efficiencies.
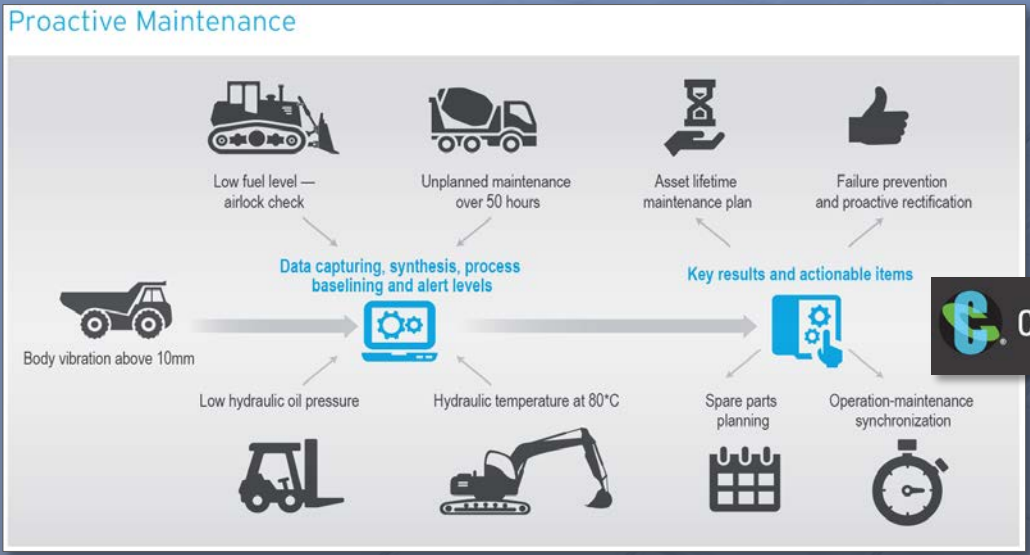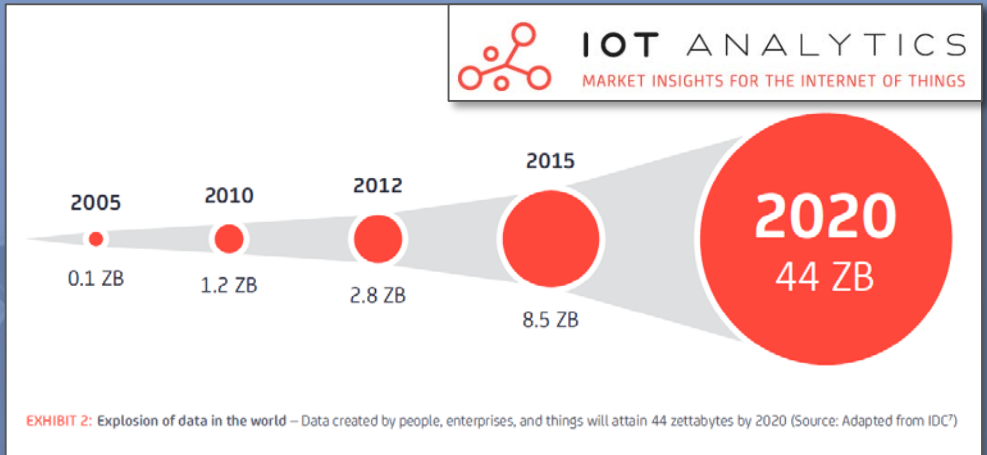
Sample IoT Use Case: Smart Cities

- ❑ IDC: By 2019, 40% of Local and Regional Governments will use IoT to turn infrastructure into assets instead of Liabilities
  - ▪ Roads
  - ▪ Street lights
  - ▪ Traffic signals

SMART CITY - USE CASES AND APPLICATIONS

Public services	Transportation	Public safety
Citizen services	Smart roads	Smart lighting
Tourist services	Connected vehicle	Environment
Public transportation	Smart parking	Asset tracking
Identity & administration	Smart traffic	Video surveillance
Information services	Noise and pollution	Emergency response
Sustainability	**Integrated smart functions**	**Infrastructure**
Environment monitoring	Smart care	Smart infrastructure
Smart waste management	Smart education	Structural health
Smart energy	Smart governance	Smart buildings
Smart metering	Smart planning	Smart irrigation
Smart water	Smart/open data	Smart roads

Volume of IoT data growing exponentially

Figure 1. Smart City Operating Governance Framework

Smart Buildings · Smart Public Services · Smart Education · Smart Utilities · Smart Healthcare · Smart Transportation

Smart City Operating Governance Framework

Source: Gartner (October 2015)

Gartner

IOT ANALYTICS
MARKET INSIGHTS FOR THE INTERNET OF THINGS

2005 — 0.1 ZB
2010 — 1.2 ZB
2012 — 2.8 ZB
2015 — 8.5 ZB
2020 — 44 ZB

EXHIBIT 2: Explosion of data in the world – Data created by people, enterprises, and things will attain 44 zettabytes by 2020 (Source: Adapted from IDC[7])

Proactive Maintenance

Low fuel level — airlock check · Unplanned maintenance over 50 hours · Asset lifetime maintenance plan · Failure prevention and proactive rectification

Data capturing, synthesis, process baselining and alert levels

Key results and actionable items

Body vibration above 10mm

Low hydraulic oil pressure · Hydraulic temperature at 80°C · Spare parts planning · Operation-maintenance synchronization

Cognizant

One Airbus 380 generates 1TB of data every takeoff

Governing the IoT Data: the main issues

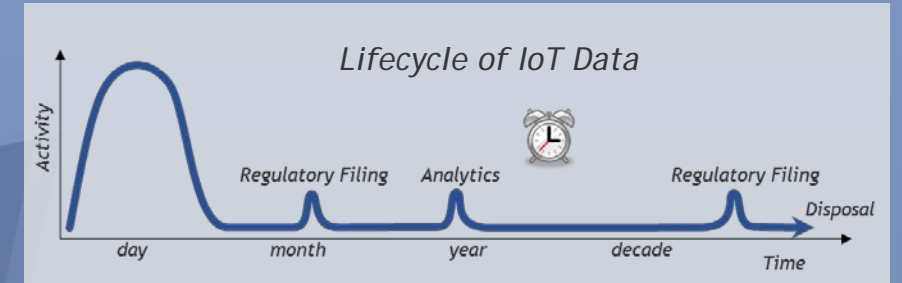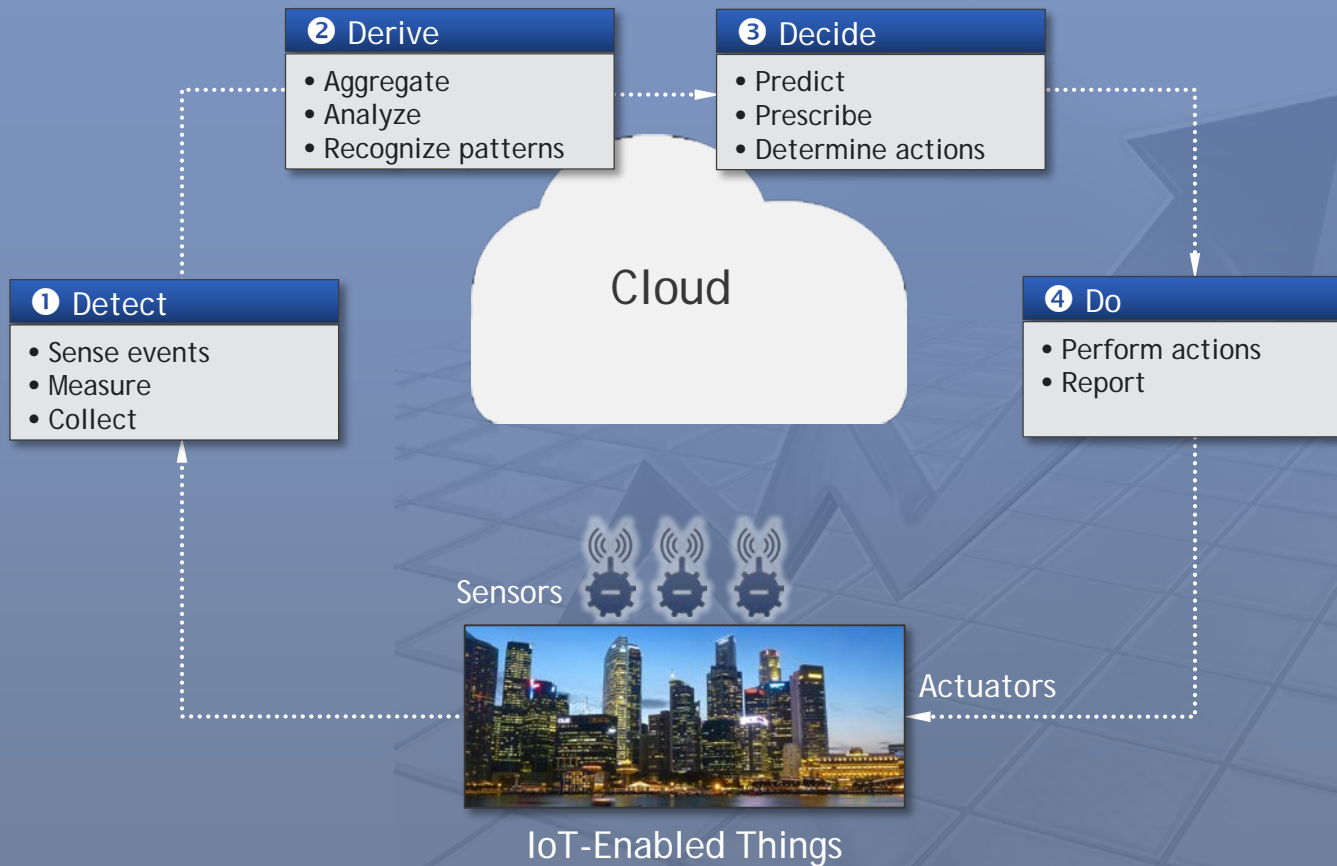| Definition	Ownership	Security	Authenticity and Integrity	Rights and Duties	Lifecycle	Maturity
• What is the data? • Should this data be governed?	• Who owns the data?	• Cybersecurity • Privacy • Leaks	• How to preserve its authenticity and integrity?	• Rights and obligation towards this data?	• What is its lifecycle? • How to manage it?	• What is the IG maturity level of the IoT solution adopters? • IT vs OT
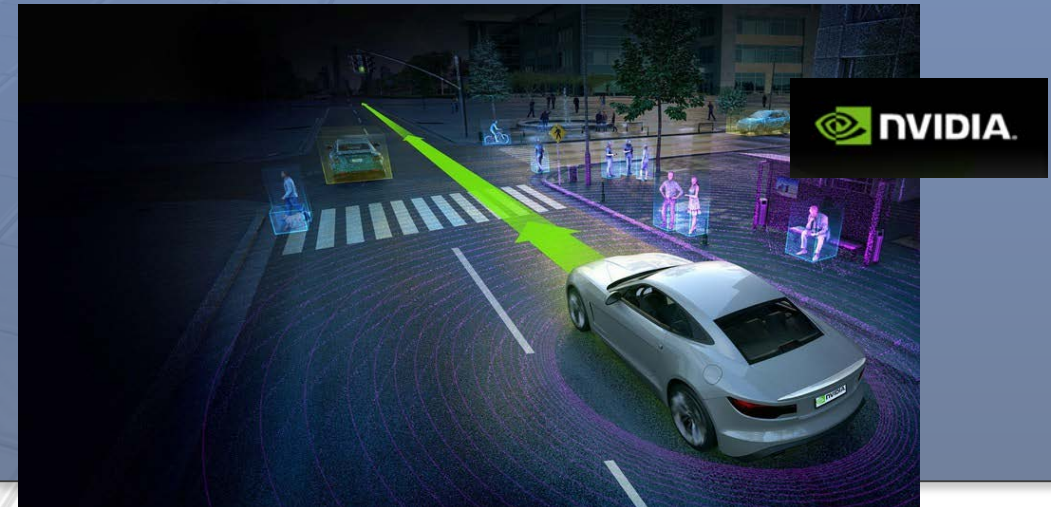
The 4Ds + 1G of IoT™

The 4Ds + 1G of IoT™

❷ Derive
- Aggregate
- Analyze
- Recognize patterns

❸ Decide
- Predict
- Prescribe
- Determine actions

❶ Detect
- Sense events
- Measure
- Collect

❹ Do
- Perform actions
- Report

Cloud

Sensors

Actuators

IoT-Enabled Things

Lifecycle of IoT Data

Activity

Regulatory Filing   Analytics   Regulatory Filing

Disposal

day   month   year   decade   Time

❺ Govern IoT Data... 4Ds+1G™
- Establish Corporate Policies
- Retain
- Dispose of
- Discover
- Enable Compliance
- Apply Litigation Holds
- Assist with Privacy
- Manage Data Residency
- Assist Product Development
- Manage Information Assets as Corporate Assets

Govern function must be integrated with the 4D functions.

New Information Governance Challenges

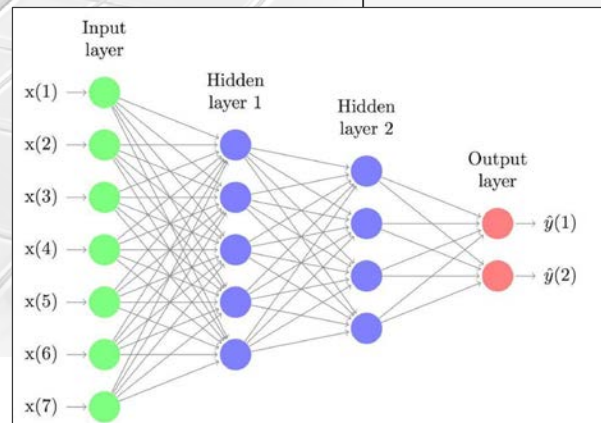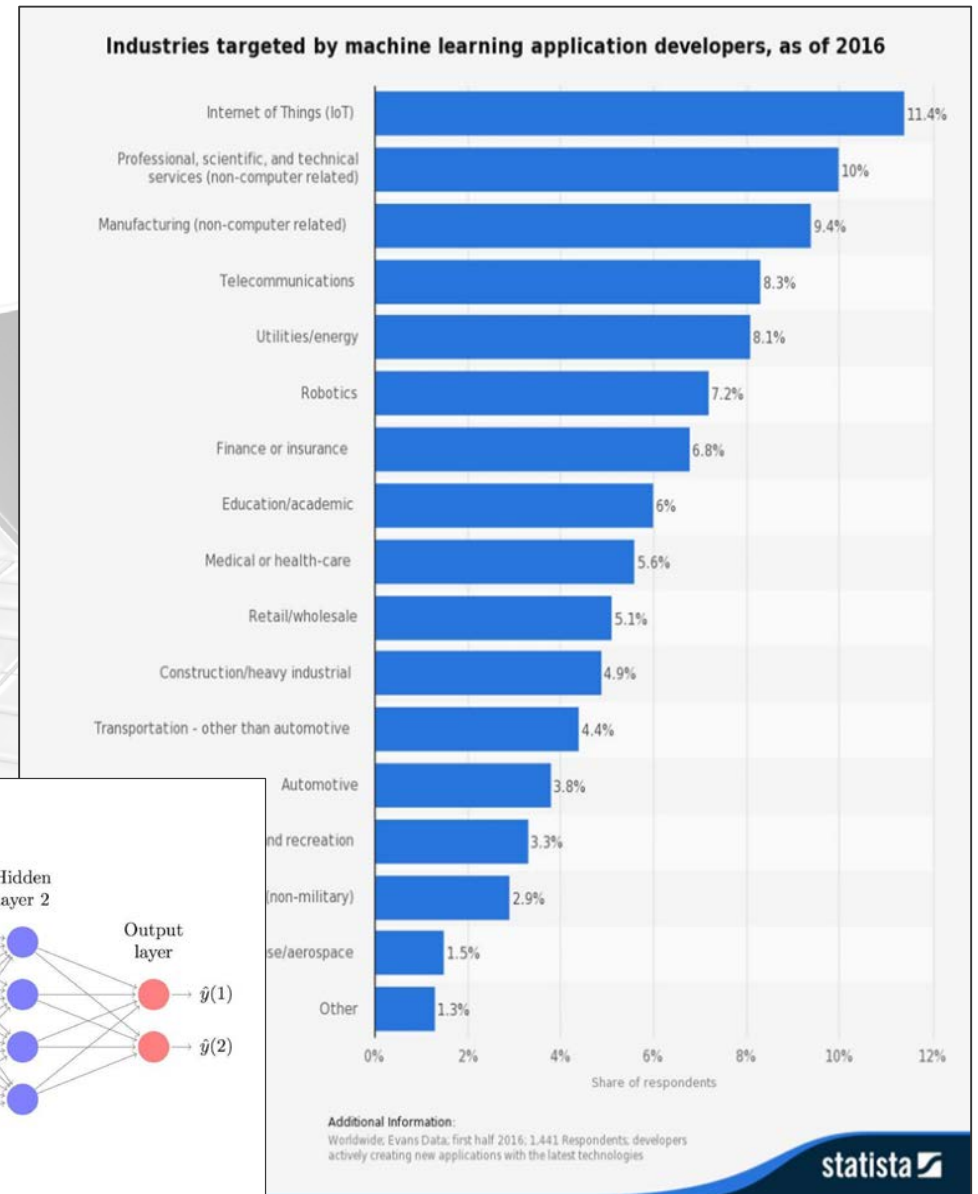Corporate Information Assets

Internet of Things Data

Artificial Intelligence

Discussion

Artificial Intelligence (AI)

- AI enables software to behave like humans which allows devices to perceive, analyze data, reason, talk, make decisions and act.

- Explosion of AI, embedded in devices around us
  - AI one of top 10 strategic technologies for 2017
  - Impact on world economy in 2020 = $ trillions
    - McKinsey
  - Speech and object recognition, autonomous cars…

- Key breakthroughs
  - Breakthroughs in Deep Neural Nets
  - Availability of large training sets
  - Inexpensive GPU cards
    - NVIDIA

Industries targeted by machine learning application developers, as of 2016

Industry	Share of respondents
Internet of Things (IoT)	11.4%
Professional, scientific, and technical services (non-computer related)	10%
Manufacturing (non-computer related)	9.4%
Telecommunications	8.3%
Utilities/energy	8.1%
Robotics	7.2%
Finance or insurance	6.8%
Education/academic	6%
Medical or health-care	5.6%
Retail/wholesale	5.1%
Construction/heavy industrial	4.9%
Transportation - other than automotive	4.4%
Automotive	3.8%
and recreation	3.3%
(non-military)	2.9%
se/aerospace	1.5%
Other	1.3%

Additional Information:
Worldwide; Evans Data; first half 2016; 1,441 Respondents; developers actively creating new applications with the latest technologies

statista

AI-enabled systems can…

❑ Can plug holes human-led efforts leave behind

❑ Bring disruptive changes that can challenge economical, legal and ethical fabric of society

- Jobs
- Bias
- Responsibility
- Privacy
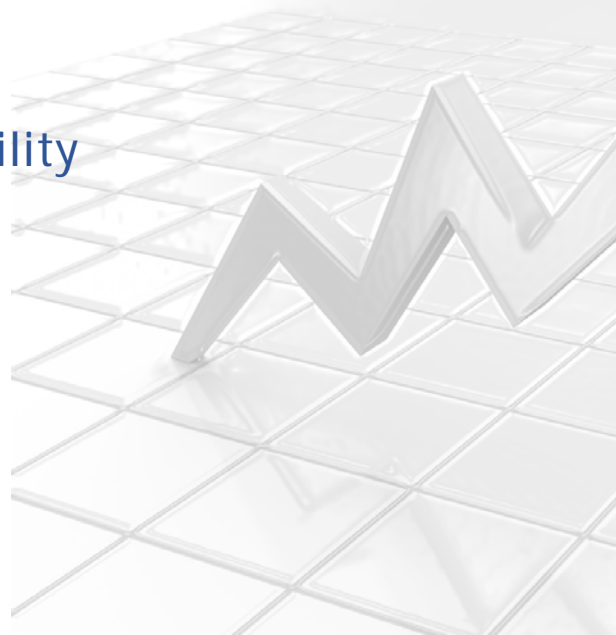
Bassam Zarkout @bzarkout   27 Feb
4 challenges #AI companies must address: Jobs, Bias, Responsibility, Privacy… a way to go still. tnw.to/2mvaliG via @TheNextWeb

4 challenges Artificial Intelligence must address
If news, polls and investment figures are any indication, Artificial Intelligence and Machine Learning will soon become an inherent part of everything we do in our daily lives. Backing up the…
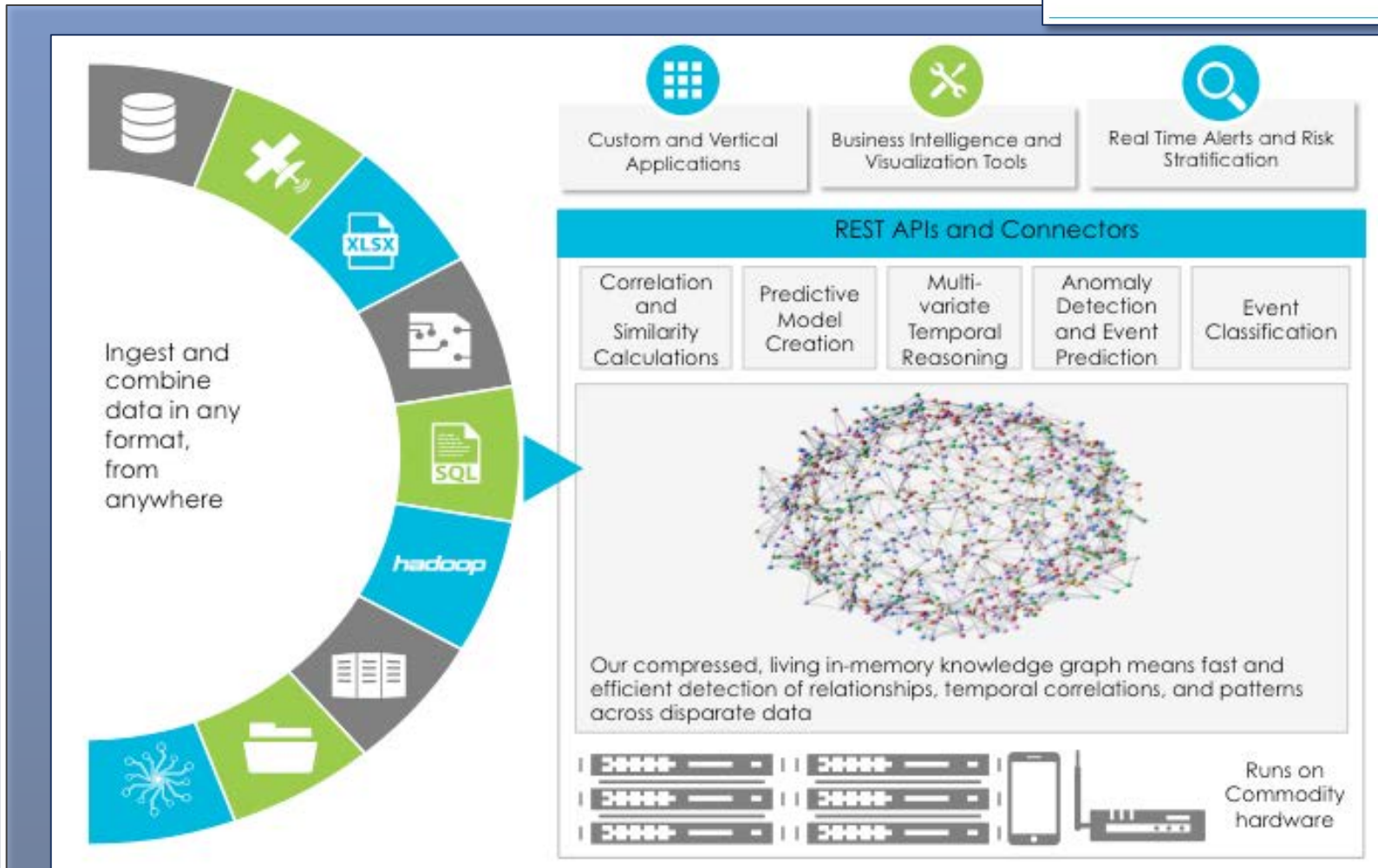thenextweb.com

AI-enabled systems can...

- Make calculated decisions more quickly than humans
  - Ingest information, analyze it
  - Example: AI can speed up investment decisions

- Suggest process or strategic changes by analyzing data collected from
  - Regulatory and trade bodies' feeds
  - Social media
  - News sites
  - Competitor websites

- Assist organizations with GRC and IG functions

Bassam Zarkout @bzarkout   26 Feb
#AI in #GRC and Information Governance - itproportal.com/features/th...

The road ahead: the coming rise of Artificial Intelligence in Governance, Risk and Compliance
More advanced GRC technology and thinking is needed if today's businesses hope to succeed.
itproportal.com

Example of Vendor Offerings

▼simularity

Artificial Intelligence For Predictive Maintenance, Event Prediction, and Anomaly Detection

Custom and Vertical Applications

Business Intelligence and Visualization Tools

Real Time Alerts and Risk Stratification

REST APIs and Connectors

Correlation and Similarity Calculations

Predictive Model Creation

Multi-variate Temporal Reasoning

Anomaly Detection and Event Prediction

Event Classification

Ingest and combine data in any format, from anywhere

XLSX

SQL

hadoop

Our compressed, living in-memory knowledge graph means fast and efficient detection of relationships, temporal correlations, and patterns across disparate data

Runs on Commodity hardware

Flexible, Scalable, Smart, Real Time

Fast and Cost-Effective Deployment

AI at the edges of the IoT

How can AI contribute to Information Governance

- ❑ Automate the RM and IG processes

- ❑ Other… tbd

New Information Governance Challenges

Corporate Information Assets

Internet of Things Data

Artificial Intelligence

Discussion

Summary

❑ Govern Corporate Information

- IG Programs must deal with Information Assets and not just records
- IG Programs must deliver real value to various stakeholders (especially IT)

❑ Govern IoT Data

- Produce Better Outcomes
- Volumes of IoT Data expected to explode
- IoT Data should be governed
  - The 4Ds + 1G of IoT™

❑ Leverage AI in Information Governance

- AI software allows devices to perceive, analyze data, reason, talk, make decisions and act
- AI can assist with GRC and IG functions

The 4Ds + 1G of IoT™
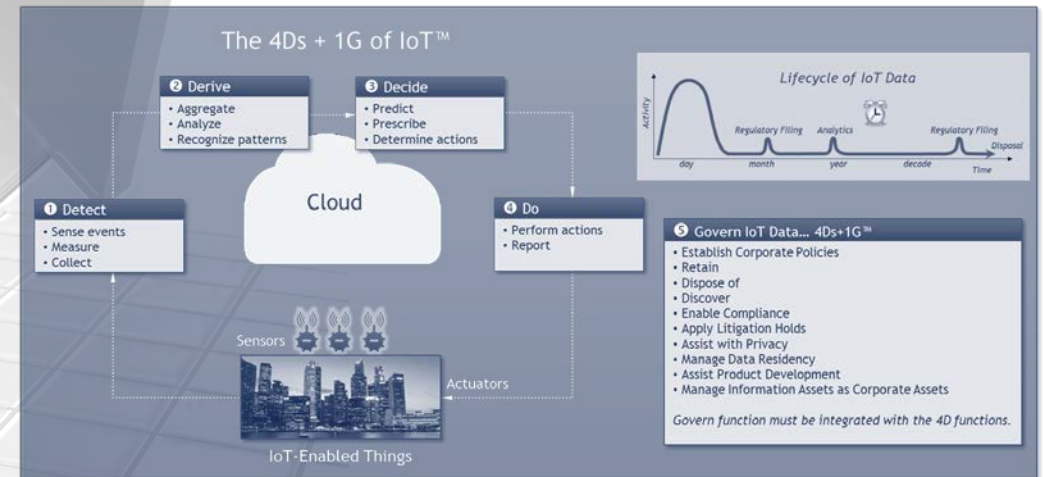
Let us discuss...

Thank You...

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skype: bzarkout
web: www.ignpower.com