Hitachi Data Systems

HITACHI
Inspire the Next

BIG DATA ANALYTICS
STRATEGY & USE-CASES

Christian Dornacher

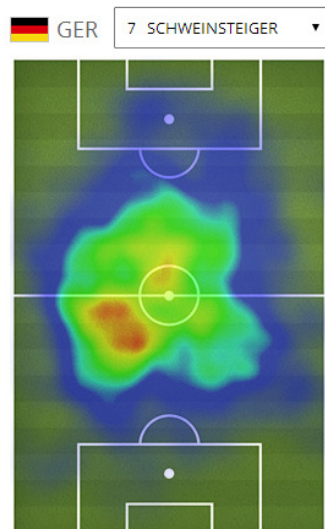**GridKa School**
Big Data, Cloud Computing
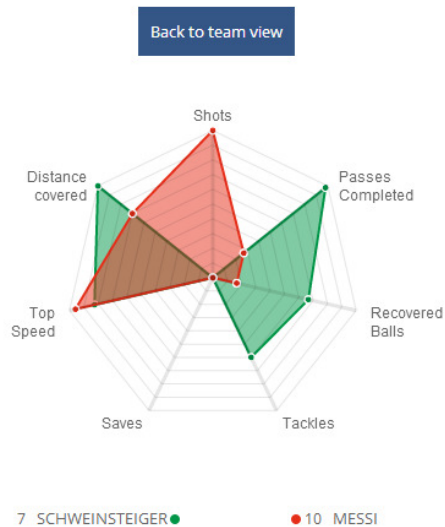and Modern Programming **2014**

Agenda

- Big Data Analytics are everywhere

- Hitachi's Vision: Social Innovation

- Hitachi's strength and strategy

- Analytics architecture

- Use-Cases

Big Data Analytics help to win games…

Source:
http://www.fifa.com/worldcup/statistics/index.html

Analyze global patterns

Migration patterns of people around the world from 1990 to 2010. Physicists in Vienna, Austria, created the graphic based on U.N. census data.

http://www.global-migration.info/

The Analytics and Data Revolution
Bigger and Better Insight Drives Bigger and Better Outcomes

THINGS
INDUSTRIAL/SOCIAL INFRASTRUCTURE, MOBILE DEVICES....

HUMAN
EMPLOYEES, CUSTOMERS...

TRANSACTIONAL (TX)
FINANCIAL APPS, BUSINESS APPS

DATA EVOLUTION

THE PAST
WHAT HAPPENED ?
BI AND REPORTING

THE PRESENT
WHAT'S HAPPENING NOW ?
REAL TIME

THE FUTURE
WHAT WILL HAPPEN ?
PREDICTIVE

CONTROL FUTURE
WHAT SHOULD WE DO ?
PRESCRIPTIVE

ANALYTICS EVOLUTION
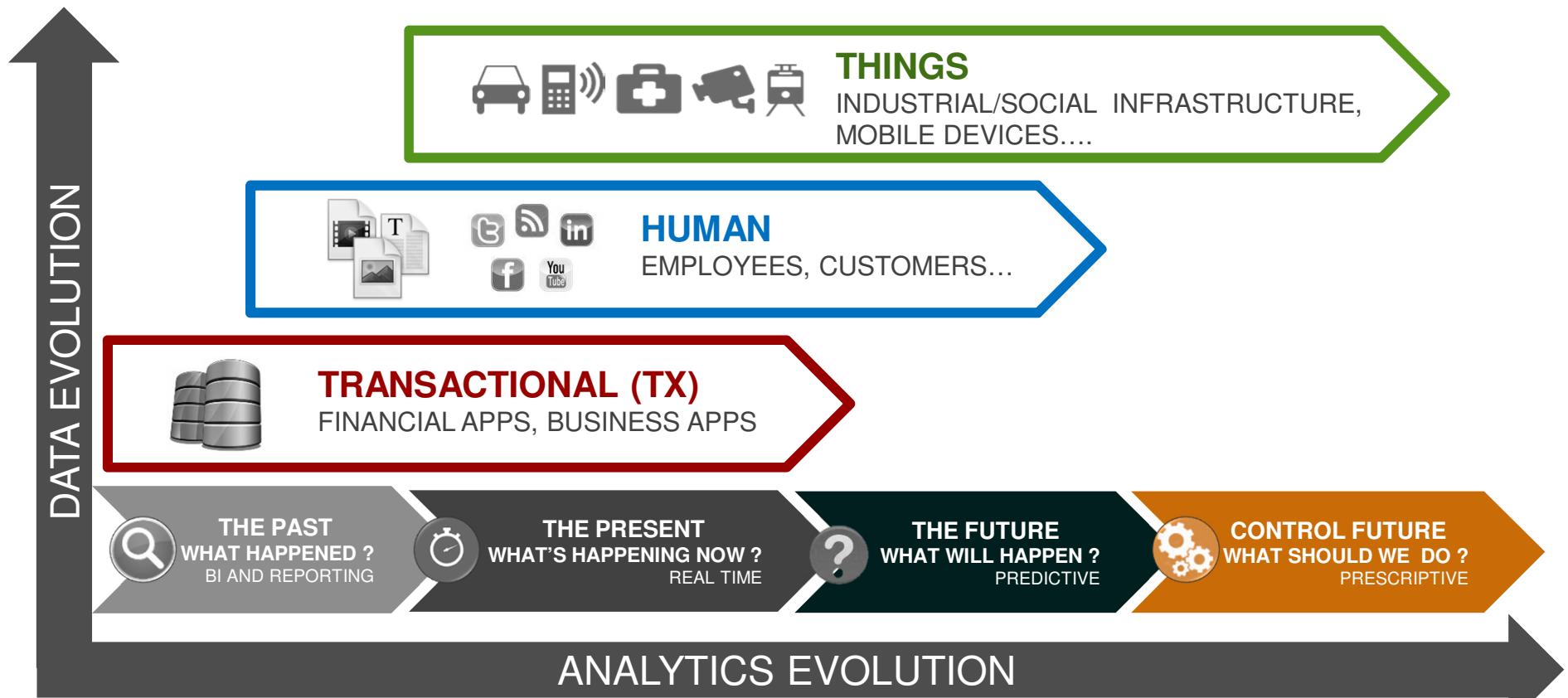
Integrating IT and Infrastructure Technologies for a Safer, More Secure World
Hitachi Social Innovation Business

Hitachi is one of the biggest WW Enterprises

HITACHI
Inspire the Next

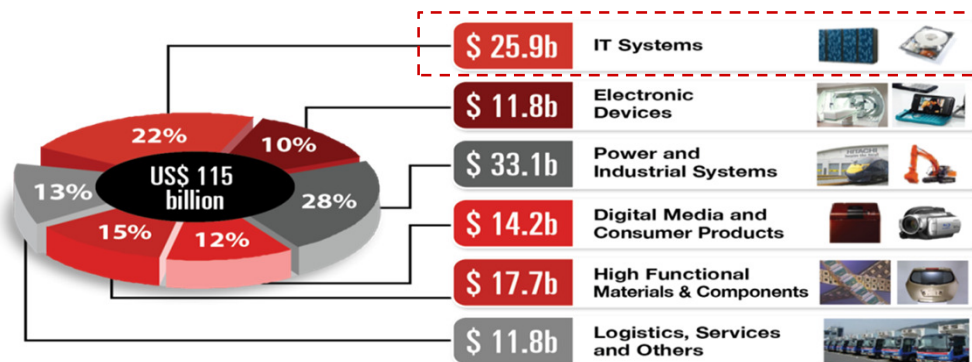## NO. 38 - 2012 FORTUNE GLOBAL 500®

One of the world's largest integrated electronics companies

- **Founded in 1910**
- 900 subsidiaries
- **>380.000 employees**
- Over 760 PhDs

- **FY12 sales of US$115B**
- **FY12 R&D Investment: US$5B**
- World leader in virtualization

GLOBAL FOOTPRINT

EUROPE
- 9,488 Employees

JAPAN
- 230,948 Employees

NORT AMERICA
- 14,667 Employees

ASIA (INC. CHINA)
- 99,216 Employees

OTHER AREAS
- 5,427 Employees

2012 **WORLD'S MOST ETHICAL COMPANIES**
WWW.ETHISPHERE.COM

11 INDUSTRY SEGMENTS OF HITACHI GROUP (Revenue by Industry Segment)

$ 25.9b	IT Systems
$ 11.8b	Electronic Devices
$ 33.1b	Power and Industrial Systems
$ 14.2b	Digital Media and Consumer Products
$ 17.7b	High Functional Materials & Components
$ 11.8b	Logistics, Services and Others

⊙ **Hitachi Data Systems**

US$ 115 billion
22% | 10% | 28% | 12% | 15% | 13%

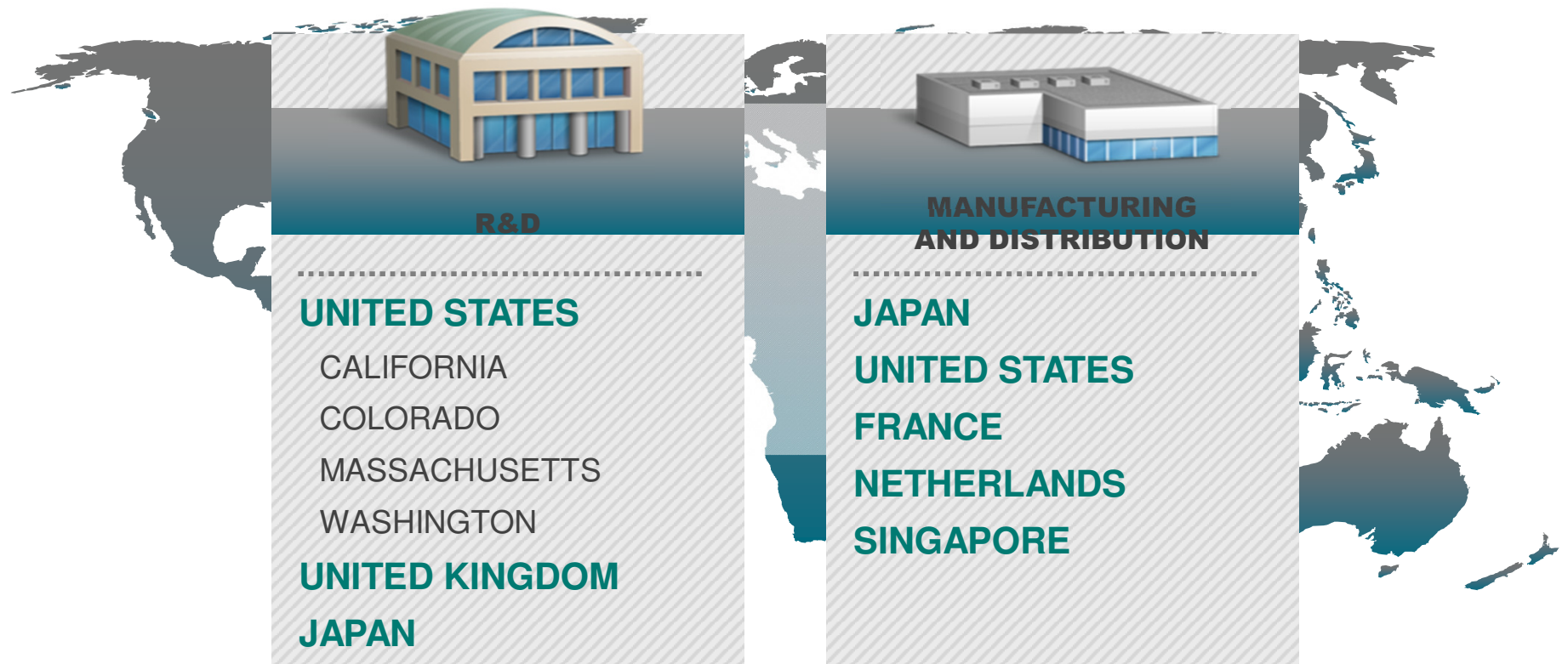**IT is 20% of Hitachi revenues**

Strong acceptance in largest companies in world

- **44 of the top 50** *Fortune Global 500* Enterprises are Hitachi Customers

FORTUNE 100 BEST COMPANIES TO WORK FOR 2012

Global development and distribution

HITACHI
Inspire the Next

R&D

UNITED STATES
- CALIFORNIA
- COLORADO
- MASSACHUSETTS
- WASHINGTON

UNITED KINGDOM

JAPAN

MANUFACTURING AND DISTRIBUTION

JAPAN

UNITED STATES

FRANCE

NETHERLANDS

SINGAPORE

Technologies are converging
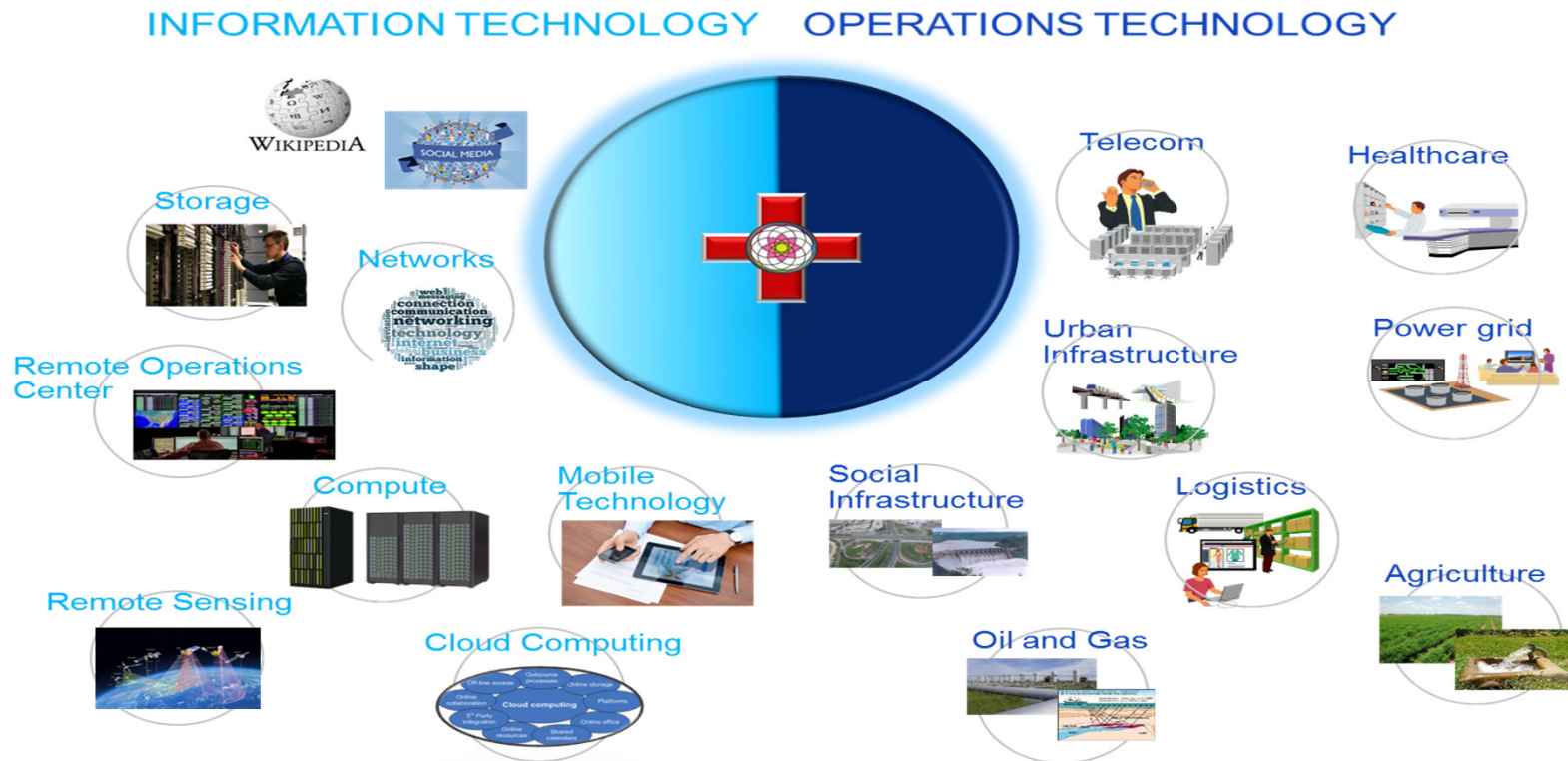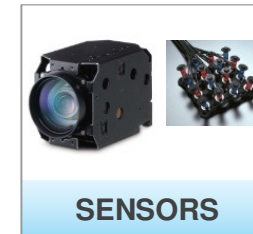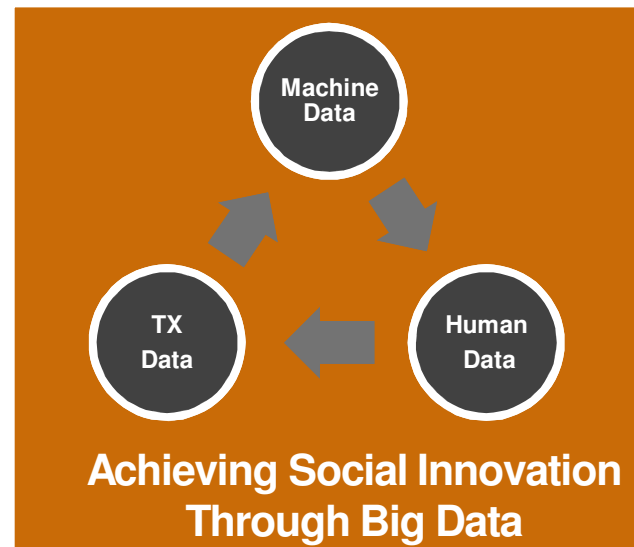

Information technology (IT) and operational technologies (OT) are progressively converging into a single ecosystems where information technologies are functional to improve operational excellence

The Internet of Things that Matter

ROBOTICS

IT INFRASTRUCTURE

AUTOMOTIVE SYSTEMS

MINING EQUIPMENT

RAILWAY CONTROL SYSTEMS AND TRAINS

BATTERY SYSTEMS

WEARABLES

GAS TURBINES

MEDICAL IMAGING

Machine Data

TX Data

Human Data

Achieving Social Innovation Through Big Data

SENSORS

WATER TREATMENT

PROGRAMMABLE CONTROLS

WIND TURBINES

Convergence: IT and the business

Biometrics solutions (Finger vein)

Big Data Analytics - Industry Vertical Solution

Convergent Solutions

Convergent solutions for DB Machine
ORACLE
SAP HANA
Microsoft SQL Server

Convergent solutions for Virtualization
vmware
CiTRiX
Microsoft Hyper-V

Data Management (Storage)

Computing (x86)

IT Operations Analytics for DC Availability & Troubleshooting

IT Operations Security & Compliance Real Time Analytics

Network Real Time Analytics

Smart Mobility Solutions

Energy Production Optimization Analytics

IT Operations

Network

Smart Mobility

Energy

Identity and Access Management Solution (security)

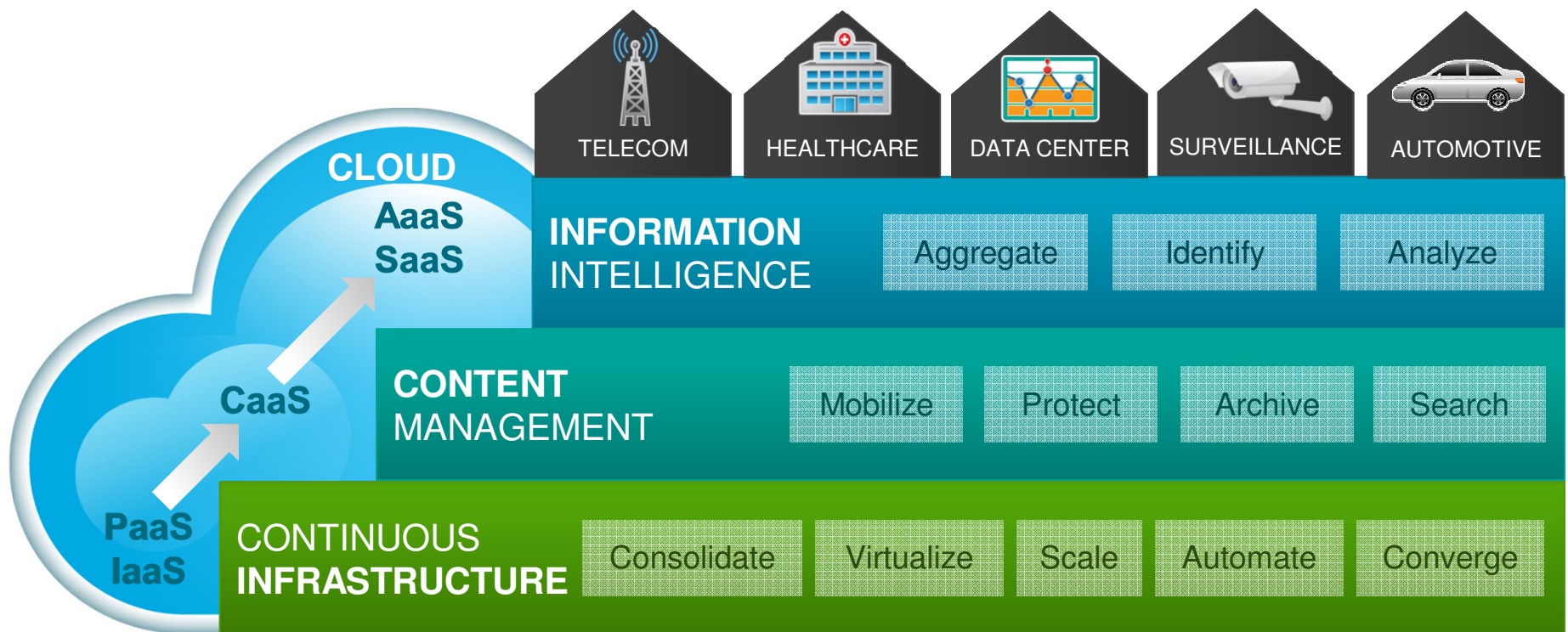Data Center facilities solutions (cooling & green IT)

Data management, computing and convergent solutions are our core capabilities, which are extended by our big data analytics solutions for different verticals

Hitachi Data Systems Strategy
From Information Infrastructure to Big Data Solutions

MACHINE 2 MACHINE   **UNSTRUCTURED DATA**   **SENSORS**   **STREAM DATA**   **HYBRID ANALYTICS ...**

TELECOM | HEALTHCARE | DATA CENTER | SURVEILLANCE | AUTOMOTIVE

CLOUD
AaaS
SaaS

INFORMATION INTELLIGENCE

Aggregate | Identify | Analyze

CaaS

CONTENT MANAGEMENT

Mobilize | Protect | Archive | Search

PaaS
IaaS

CONTINUOUS **INFRASTRUCTURE**

Consolidate | Virtualize | Scale | Automate | Converge

Hitachi Strategy

Big Data Solution Framework

Hardware/Software stack for developing, deploying, and executing high-performance analytic applications

Big Data Services

Key Analytics Enabled Services

Big Data Solutions

Integrated, highly leveraged, repeatable solutions in selected domains:

- Social infrastructure
- Energy
- Healthcare
- Oil and Gas
- CME

- Mining
- Power Transmission and Distribution
- Transportation
- IT and Network ops

Integrated Social Innovation Solutions and Services

Big Data Solution Framework

Analytics Technologies

Data Platform Technologies

Our strategy is to develop solutions that leverage our multi-industry operational technologies experience in combination with our IT capabilities

Unstructured content: untapped insight BIG opportunity

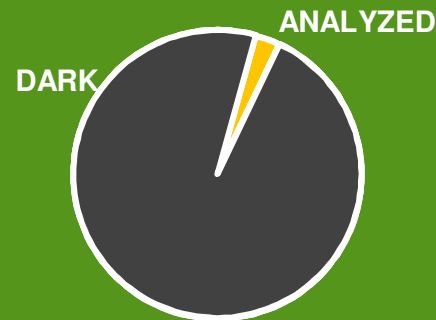## CONSOLIDATING CONTENT SILOS IS THE FIRST STEP TO INSIGHT

STRUCTURED DATA

DARK

ANALYZED

< 20% of data structured
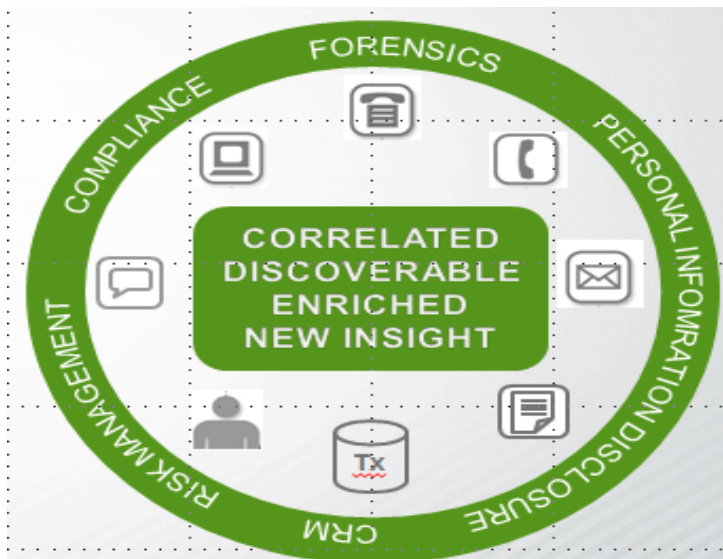
**Foundation for insight
DATA WAREHOUSE**

UNSTRUCTURED CONTENT IS THE UNTAPPED OPPORTUNITY

UNSTRUCTURED DATA

ANALYZED

DARK

> 80% of data unstructured

< 0.5% analyzed today

20%+ could hide insight (IDC)
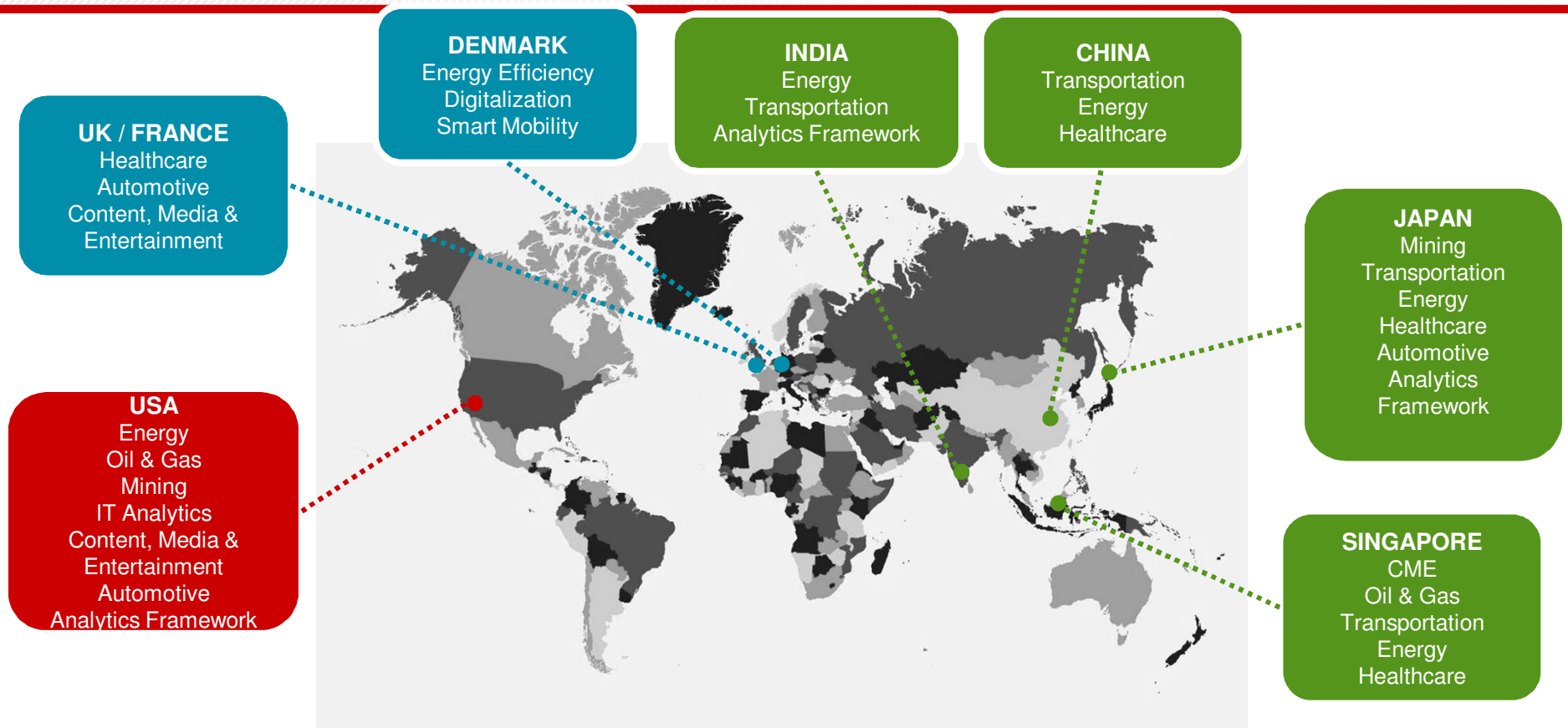
**Foundation for insight
HDS INFORMATION CLOUD**

FORENSICS

COMPLIANCE

PERSONAL INFOMRATION DISCLOSURE

RISK MANAGEMENT

CRM

CORRELATED DISCOVERABLE ENRICHED NEW INSIGHT

Tx

"Information Bunker"

OPPORTUNITY IN EVERY INDUSTRY

Hitachi Global Centers for Innovative Analytics

HITACHI
Inspire the Next

DENMARK
Energy Efficiency
Digitalization
Smart Mobility

INDIA
Energy
Transportation
Analytics Framework

CHINA
Transportation
Energy
Healthcare

UK / FRANCE
Healthcare
Automotive
Content, Media &
Entertainment

JAPAN
Mining
Transportation
Energy
Healthcare
Automotive
Analytics
Framework

USA
Energy
Oil & Gas
Mining
IT Analytics
Content, Media &
Entertainment
Automotive
Analytics Framework

SINGAPORE
CME
Oil & Gas
Transportation
Energy
Healthcare

15

Iterative Approach to Solution Development
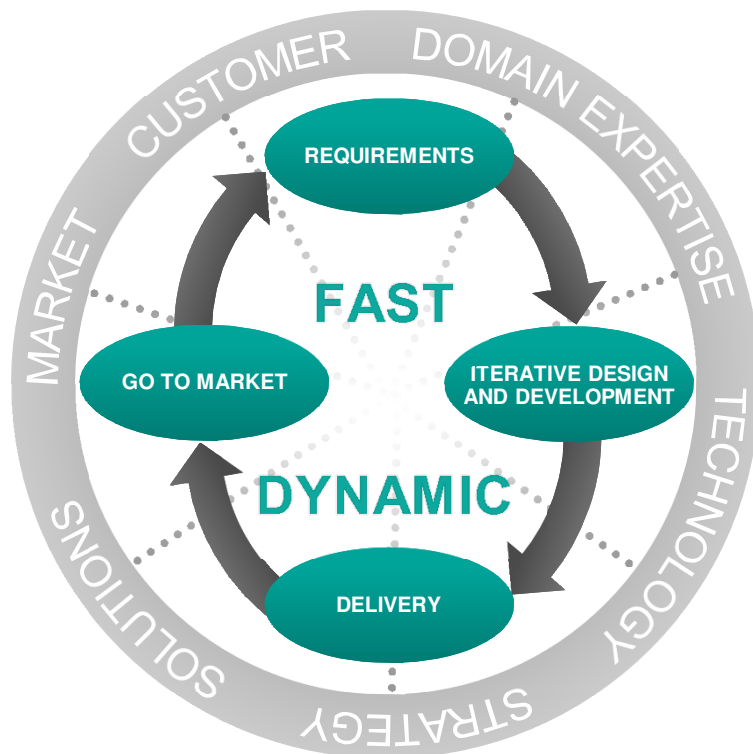
- Requirements Driven
- First-of-a-Kind Solution
- Capture IP and Best Practices
- Package for Delivery
- Apply Across New Use Cases

16

Analytics
Advantage

Hitachi's Analytics Platform - Value Proposition

Evolving Analytics Architecture
Foundation for Social Innovation Solutions

SOLUTIONS (HITACHI, GLOBAL SYSTEMS INTEGRATORS AND PARTNERS)

SMART INGEST
Data capture
Stream processing
Event extraction
Data enrichment

VISUALIZATION AND INSIGHTS

PRESENTATION AND ACTION
Event detection: predictive and prescriptive control
Search, diagnosis, correlation and root-cause analysis

BULK INGEST
Capture and index

ANALYSIS AND COMPUTE
Real-time analytics, batch analytics, hybrid analytics
Machine learning, NLP, voice/image/video

METADATA MGT
Continuous extraction
Unstructured, semi-structured
Domain specific

DATA STORAGE AND MANAGEMENT
Specialized data stores   Optimized infrastructure
In-memory, federated, scale-out, distributed

SERVICES

DATA SOURCES
Deep Domain Expertise

- Curated architecture integrating Hitachi, Open Source and partner IP.
- Open and flexible. Cloud and on-premise deployment.
- Promotes reuse and best-practice repeatability.
- Reduces application complexity to speed time to market.
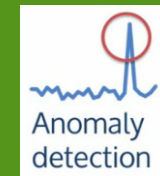
Scope of Analytics Platform

Vertical Solutions

TELECOM HEALTHCARE DATA CENTER SURVEILLANCE AUTOMOTIVE

Analytics Platform

- Data Flow
- PaaS
- IaaS
- Infrastructure

Analyze Data & Show Me KPI	Business PDCA	Business Decisions
	Analysis Application	Report, KPI, Alert … → Analysis Application / Business Logic
Design Data Flow	Data Flow Control Framework	Data Flow → Data / Data / Data / Data
Give Me Hadoop Environment	Big Data Component Provisioning	Provision 20 Nodes Hadoop Cluster → Middle Wares / Runtimes / OS
Assign Servers	Virtual Infrastructure Provisioning	Provision Virtual Servers → Virtualization
	Physical Infrastructure	Servers . . .Storage → Servers / Storage / Network

Value at Three Levels

Pre-built analytics apps and solutions for targeted verticals.

Hadoop developer kit to build analytics apps.

Scale out converged platform, ideal for private compute clouds.
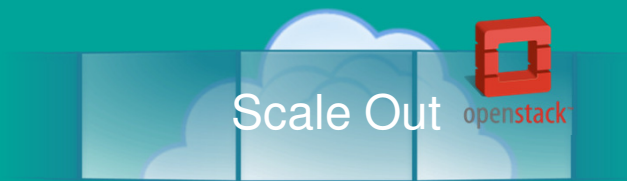
Scale Out

Analytics Use-Cases

# Network Analytics for Telecom, Content, and Service Providers
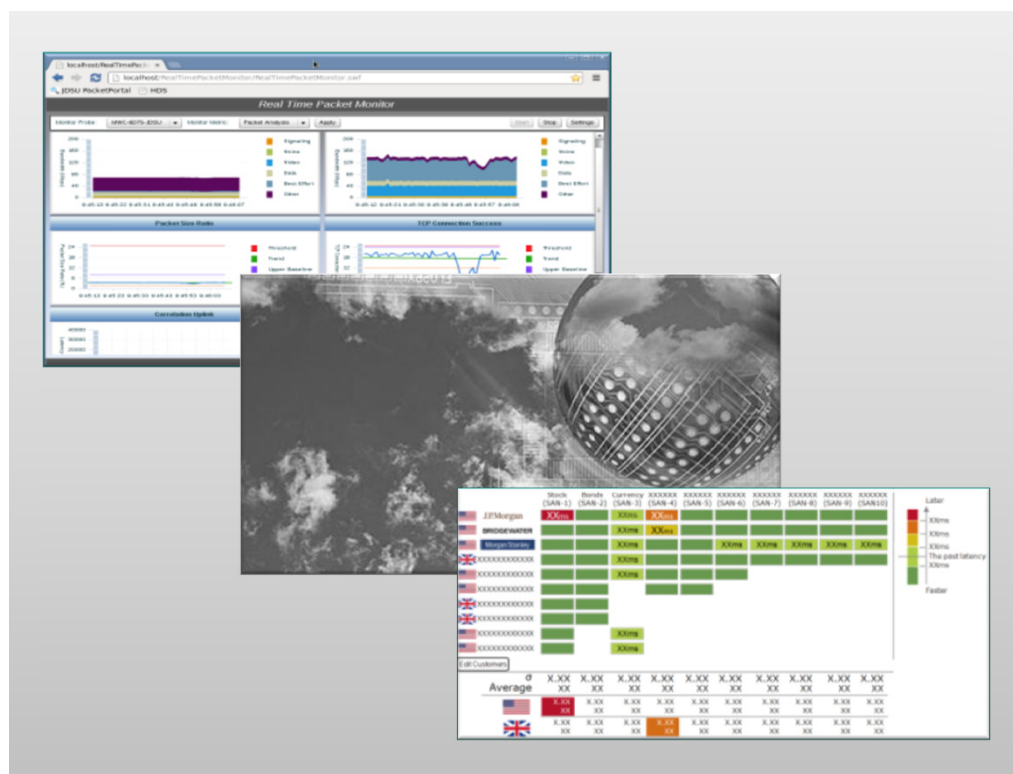
OUTCOMES

- Ingest real time network data from highly granular probes

- Combine trend analysis, machine learning and real time analytics to provide instantly consumable insight

- Deliver deep network visibility, dynamic optimization and proactive intervention

- Enables premium offerings

Network Analytics for Telecom, Content, and Service Providers
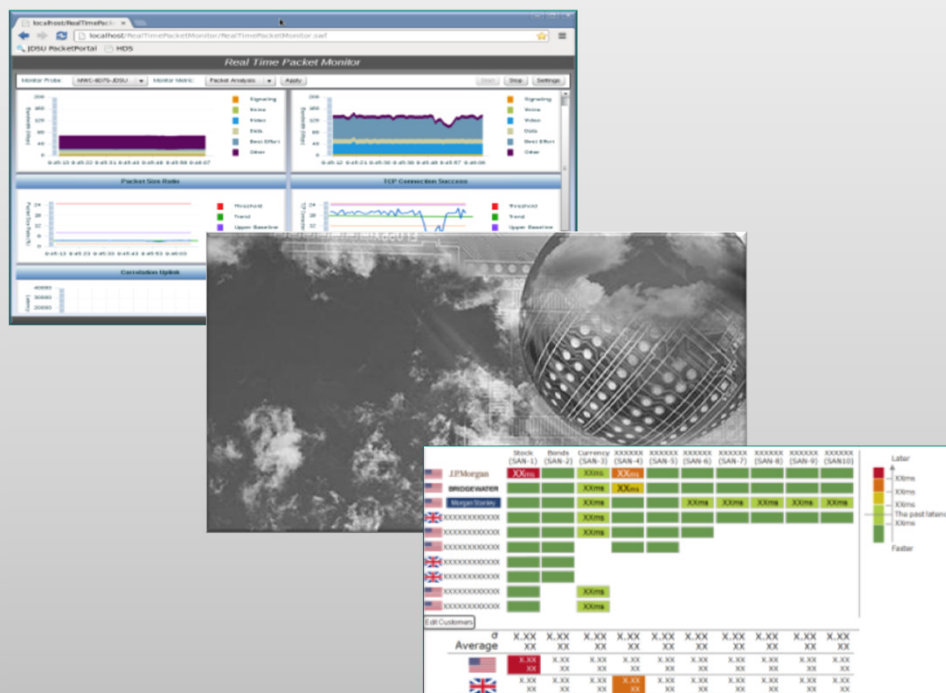
SOLUTION

- Telecom Infrastructure is a massive capital and operational expense – billions annually on CAPEX alone

- Optimization delivers huge ROI and improved customer experience

Data Center Analytics
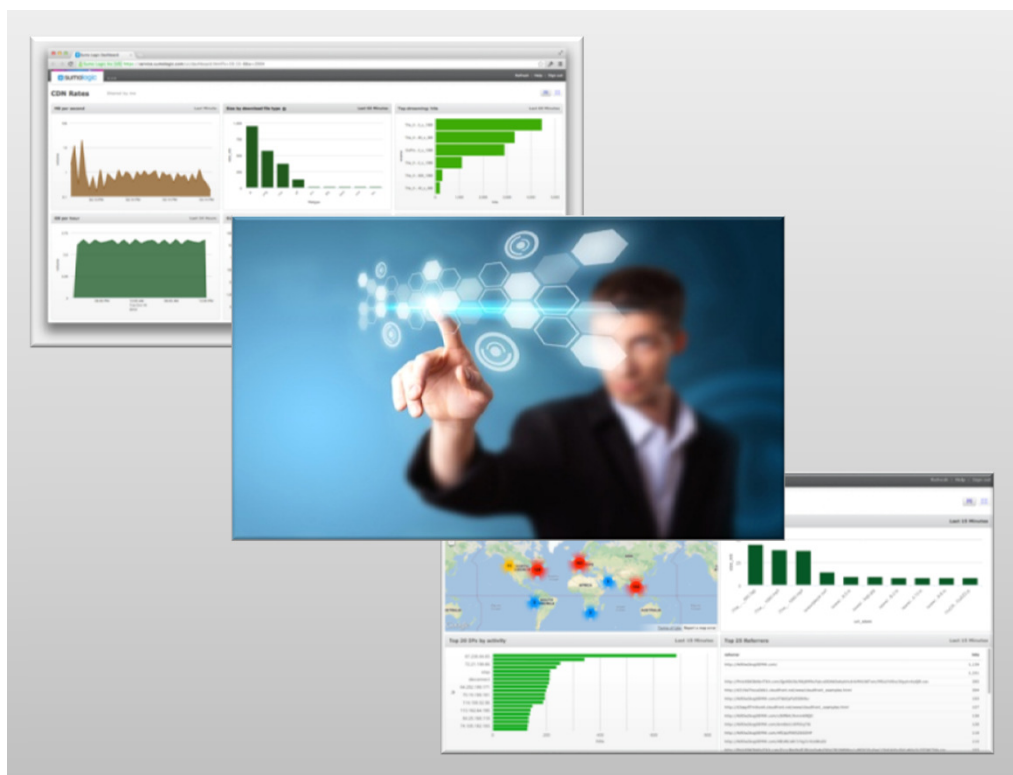
OUTCOMES

- Real-time streaming data sources collected and analyzed

- Correlates multi-channel data sources

- Predict events before they happen and take action on the data

- Real-time operational intelligence from IT device-generating sys logs

Data Center Analytics
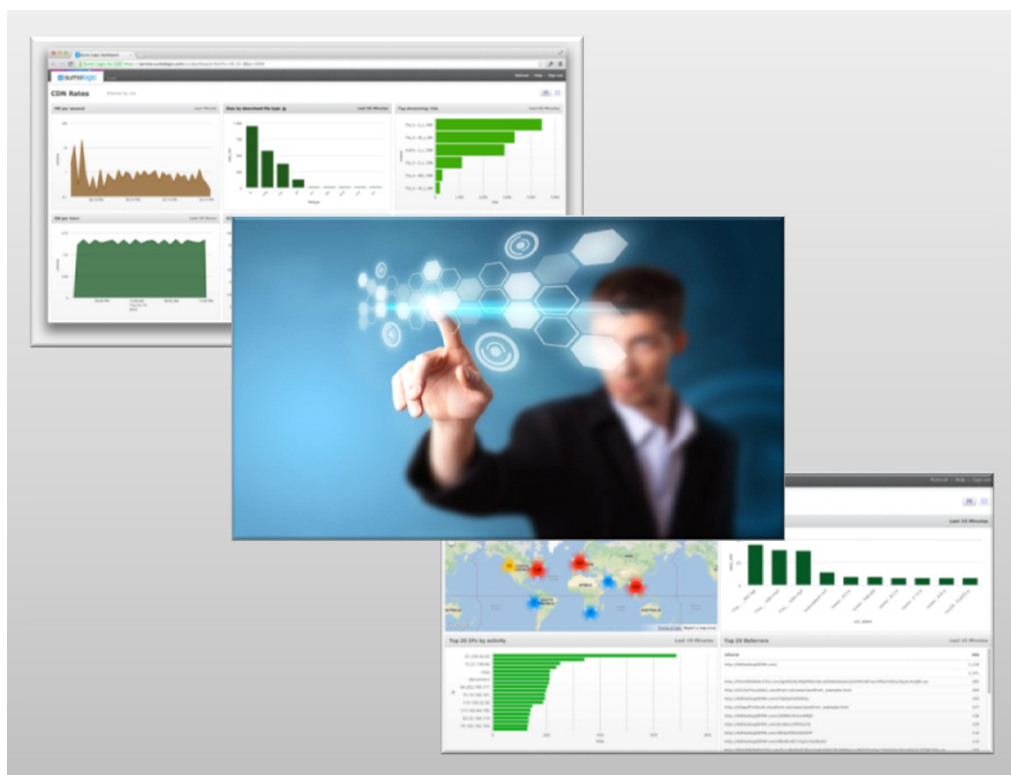
SOLUTION

- Transform Data Center data into meaningful insights

- Predictive device failure

- Root cause analysis

- Anomaly detection

Clinical Repository:
The Foundation for Connected Health
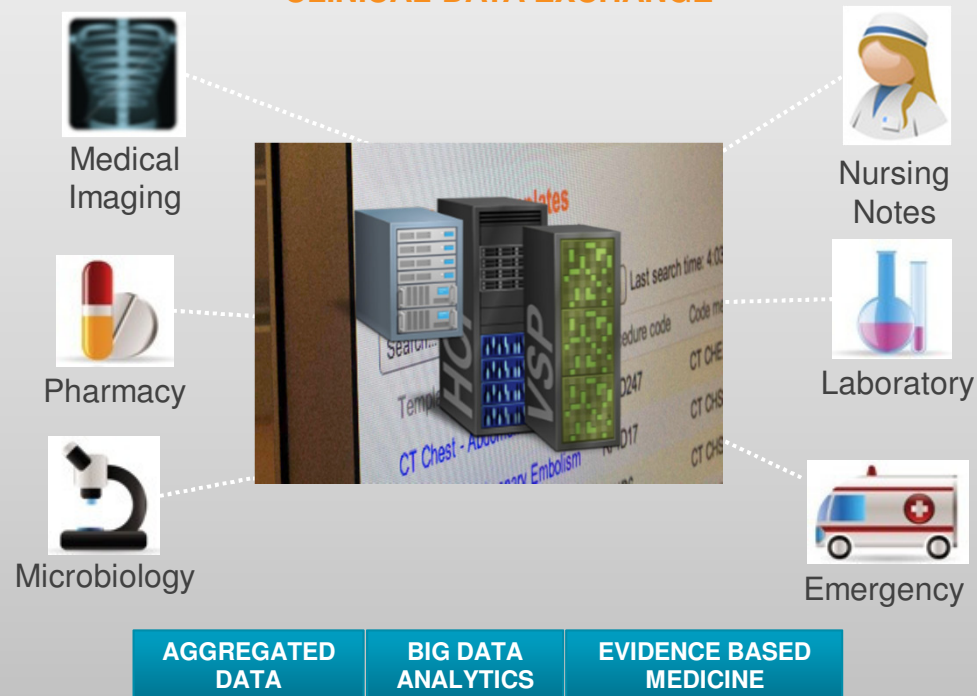
HITACHI CLINICAL REPOSITORY
CLINICAL DATA EXCHANGE

Medical Imaging

Pharmacy

Microbiology

Nursing Notes

Laboratory

Emergency

AGGREGATED DATA	BIG DATA ANALYTICS	EVIDENCE BASED MEDICINE

OUTCOMES

- Holistic view of patient enables:
  - Visualization
  - Analysis and correlation
  - Management
  - Information sharing

Clinical Repository:
The Foundation for Connected Health

HITACHI CLINICAL REPOSITORY
CLINICAL DATA EXCHANGE

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Emergency

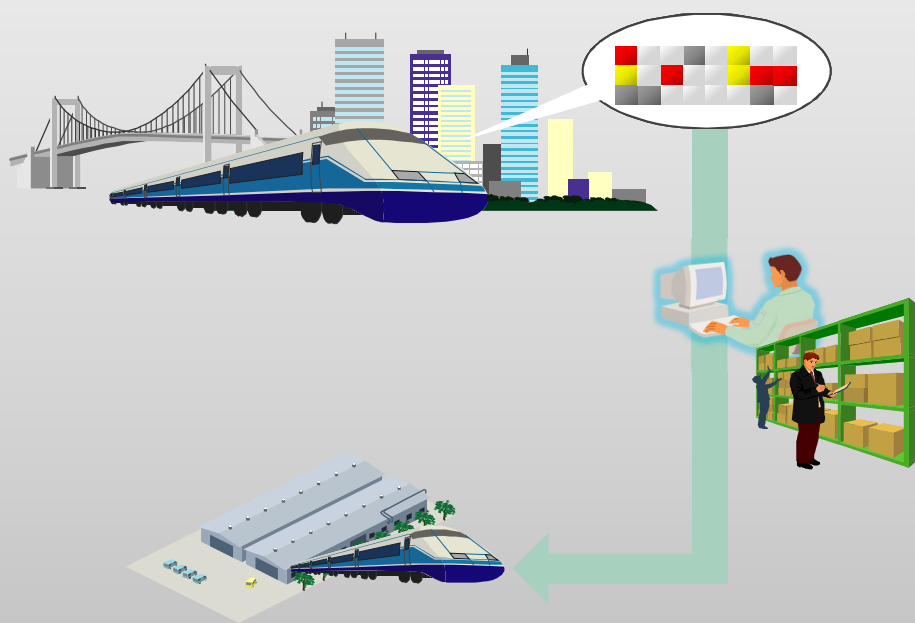| AGGREGATED DATA	BIG DATA ANALYTICS	EVIDENCE BASED MEDICINE

SOLUTION

- Aggregation of patient unstructured content

- Enriched with metadata

- Standards-based workflow

- Highly scalable, long-term active archive

Predictive Maintenance:
Remote Monitoring of Trains

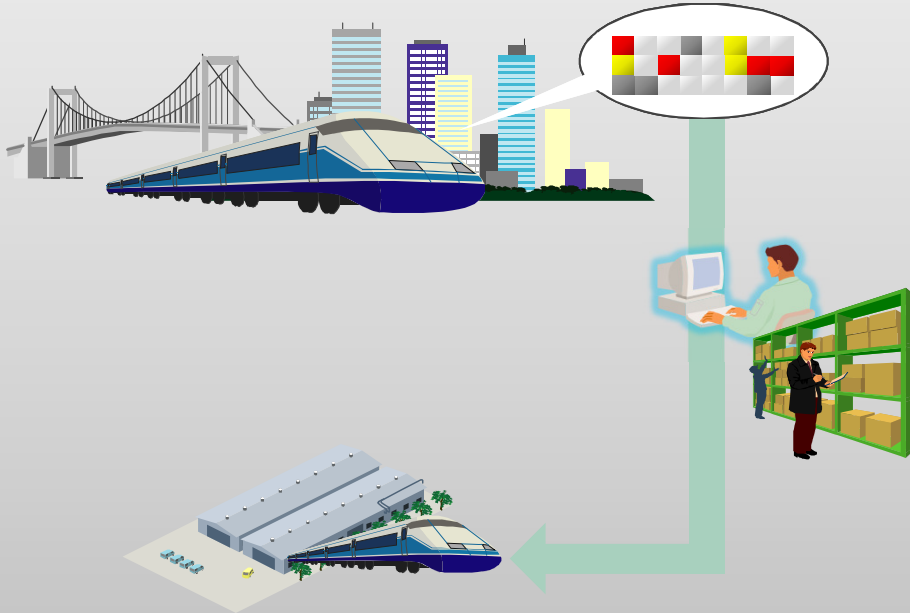Real-time monitoring of sensors

OUTCOMES

- Proactive and preventive maintenance
- Service with substantial lower cost
- Better utilization

Predictive Maintenance: Remote Monitoring of Trains
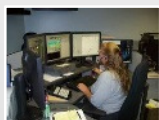
Real-time monitoring of sensors

SOLUTION

- Monitoring current status of every train component connected with parts control system

- Identifying potential issues

- Optimizing maintenance cycles

Hitachi Data Visualization Suite:
The Path to Intelligent Surveillance

HITACHI DATA VISUALIZATION SUITE
INTELLIGENT SURVEILLANCE

911 CAD

Similar Face Search

Smart Phones

Satellite Data

Video

Radar

License Plate Recognition

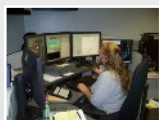| VIDEO ANALYTICS	BIG DATA ANALYTICS	EVIDENCE MANGEMENT

OUTCOMES

- Improved situational awareness and tactical intelligence

- Easier collaboration between agencies

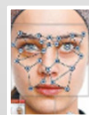- Reduced manpower and increased effectiveness

Hitachi Data Visualization Suite:
The Path to Intelligent Surveillance

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INTELLIGENT SURVEILLANCE

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VIDEO ANALYTICS	BIG DATA ANALYTICS	EVIDENCE MANGEMENT

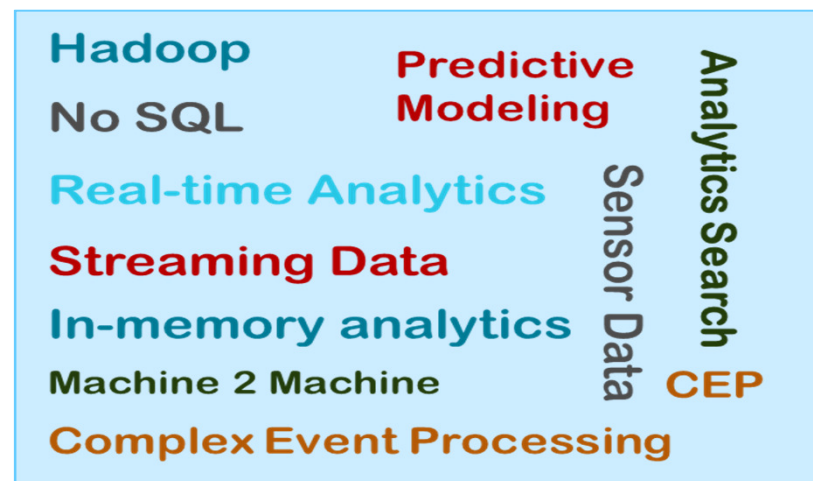## SOLUTION

- Centralized real-time analysis and visualization

- Able to ingest numerous data sources

  – Video, Social Media, Sensors, GPS.

- Evidence management from ingest to dissemination

Your Use cases

- **What are your Business Analytics and Big Data Needs?**

  - **What are the analytics challenges you are facing**

  - **What Big Data initiatives are you working on or considering?**

  - **Challenges you face?**
    – Analytics skills: Data Scientists
    – Real-Time Streaming Data
    – Archived Data Value: Dark Data
    – Data Volume and Infrastructure
    – Cloud Enablement

Hadoop
No SQL
Predictive Modeling
Analytics Search
Real-time Analytics
Streaming Data
Sensor Data
In-memory analytics
Machine 2 Machine
CEP
Complex Event Processing

Hitachi Data Systems

HITACHI
Inspire the Next

›› **INNOVATE**
WITH INFORMATION™

Thank You

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