Data Analytics and Internet of Everything
Cisco Networking Academy

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Agenda

- Introduction
- Internet of Everything (IoE)
- Evolution of Data Analytics
- Examples of IoE and Data Analytics in Industry
- Q&A
Internet of Everything
Change is Accelerating

Pervasive, Personal, & Intelligent Connections

2014 - 2016: Wearable Technologies\(^1\) emerge

2015-2017: Zettabyte Era\(^2\)
- IP Traffic: 1.4 zettabytes

2016-2018+: Use of 3D Printers\(^3\) & Commercial Drones\(^4\) Grows

2014 – 2020+: Availability of autonomous and near-autonomous cars\(^5\)

2020: 4.5B New People
37B New Things

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1 Rizzo, Tony, Wearable Technology Market Will Ship at Least 10 Million Units in 2014, 100+ Million by 2020, January 15, 2014
2 The Zettabyte Era – Trends and Analysis, May 29, 2013
3 Hayes, John, When will 3D Printing Reach a Mass Consumer Audience?, February 4, 2014
5 Autonomous car: Official predictions
Empowering Value Chains

The Internet of Everything drives value through the intelligent connection of people, processes, and data with the Internet of Things

**Value Drivers**
- Digitization driving rapid change
- Visibility into “fast data”
- New convergence opportunities
- New places to connect
- New business models

**Business Value**
- Efficient use of assets
- New offerings and faster time-to-market
- Increased productivity
- Efficient supply chains
- Enhanced customer / patient experience
IoE Value at Stake

14.4 Trillion PRIVATE SECTOR

Includes Both Industry-specific and Horizontal Use Cases:
- Customer experience
- Innovation
- Employee productivity
- Supply chain
- Asset utilization

4.6 Trillion PUBLIC SECTOR

Includes Cities, Agencies, and Verticals Such as Healthcare, Education, Defense:
- Increased revenue
- Reduced cost
- Employee productivity
- Connected militarized defense
- Citizen experience

Estimate Is Based on Bottom-up Analysis of 61 Use Cases, Including 21 for Private Sector and 40 in Public Sector (*2013-2022)

$19T*

1Bradley, Joseph et al., Embracing the Internet of Everything to Capture Your Share of $14.4 Trillion, 2013
Data Analytics
Data Analytics ... the so what? of Big Data and IoE

Analytics unlocks the predictive potential of data to improve financial performance, strategic management, and operational efficiency.
The Network is Central to the Future of Analytics

**Business Intelligence: Pre-Defined Queries**
- Descriptive/Historical
- The morning sales report

**Big Data: Analytics for Competitive Insight**
- Complex queries
- Predictive

**Structured data**
- Customer, sales, stock records
- ‘Rows and columns’
- High value, cleansed, indexed

**Unstructured data**
- Call center logs
- Mobility
- Social media

**Fast Data**
- Inspect before store
- Prescriptive; Analytics at the edge
- Immediate decisions on delivery routes, control systems, promotions

**Real-time, streaming**

**Analytics Architecture**

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**Intelligent Network**

- Milliseconds to seconds
Why Cisco Analytics?
The Network is Central to the Future of Analytics

- **Changing Customer Behaviors**
  - Cloud, Mobility
    - IoT/IoE
  - More Choices
  - Relevant Offers
  - Decisions in Minutes
  - Actions in Seconds

- **New Data Sources**
  - Environment
  - Customers
  - Sensors
  - Social Media

- **New Analytics Needs**
  - Data at Rest
    - Traditional Analytics
    - Transactional Data
    - Historic Data
  - Analytics in DC
  - Analytics at Edge
  - Batch, Historical
  - Right-time

- **Data in Motion**
  - Descriptive
  - Predictive, Prescriptive

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Examples
The Internet of Everything
Intelligent Connections and Data Analytics

Healthcare
- Enable consistent care based on best practice
- Improve operational efficiency
- Measure and act on population health
- Engage patients and consumers regarding care

Retail
- Optimize store operations
- Gain real-time insight into shopping behaviors
- Merchandise optimization
- Optimized promotions effectiveness
- Real-time demand forecast

Manufacturing & Energy
- Increased visibility and control of operations
- Condition-based maintenance
- Enable customer energy management
- Smart meter analytics
Healthcare

New connections can drive improved care delivery processes, enhanced visitor and patient experiences, and new models of care

- Enable operational efficiency of care processes
- Improve patient engagement and experience
- Enable security and privacy

Business Value

Doctors, Nurses, Staff, Patients
Care Delivery, Revenue Cycle, Insurance
Evidence-based Care, Population Care
Facilities, Devices, Equipment, Sensors
Example: Healthcare Contact Center

Enable predictive intervention, real-time segmentation and targeting, real-time routing, and encounter escalation

Patient calls into Healthcare Contact Center from web, mobile, etc. due to abnormal readings from a personal home device.

Analytics help the Healthcare Contact Center agent determine appropriate response and routing based on patient history across systems.

Agent or expert prompted to offer appropriate service based on analytics; patient and expert interact.
New ways to engage the consumer and optimize store operations

**Business Value**
- Enable employee productivity and out-of-stock reductions
- Improve shopping experience
- Enable new payment and advertising models

- Shoppers, Staff, Administration
- Marketing, Store Operations, Supply Chain
- Real-time Shopper Insight, Merchandising, Promotions
- Stores, Devices, Equipment, Sensors
Example: Store Operations Analytics

Improve store-level execution and customer service using analytics

Back office manages and responds to store resources, staffing and out of stocks

Monitor and react to out of stocks
Monitor customer flow and dwell times
Understand how long people wait in line
Understand customer approach times

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Improve store-level execution
Manage queue length at POS
Monitor crowding, in-store traffic

Need more cashiers to the front

Monitor customer behavior at digital signs
Understand customer demographics
Converged factories enable increased visibility and control of production

- Enable reliably automated and flexible production process
- Improve new product introduction and enable new services
- Enable next generation visual factories

Business Value

Factory & Field Personnel, IT, OT
Factory Operations, Supply Chain
Real-time process data analytics
Factory, Devices, Equipment, Sensors
Example: “Just-in-Time” with Context-Aware Services

Track location, status, and condition of mobile assets, people and inventory using RFID for “just in time” supply chain strategy

Sensors and devices collect production and logistics data

Aggregated view of real-time supply and production data delivered to enhance real-time analytics

Supply chain and plant manager collaborate to institute just-in-time fulfillment strategy

Sensor data and real-time analytic information shared with extended value chain
Conclusion

- Intelligent networks are the platform for the Internet of Everything
- Network is central to the future of Data Analytics
- The Internet of Everything offers value today and for years to come
Thank you.