Creating Meaningful IoE Experiences for Citizens and Consumers

Rick Hutley
Vice President, Cisco Consulting Services

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TOMORROW starts here.

Lead the change.
The Internet of Everything
Networked Connection of People, Process, Data, Things

**People**
Connecting people in more relevant, valuable ways

**Process**
Delivering the right information to the right person (or machine) at the right time

**Data**
Leveraging data into more useful information for decision making

**Things**
Physical devices and objects connected to the Internet and each other for intelligent decision making; often called Internet of Things (IoT)
## IoE Is Driving Exponential Change

<table>
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<th>IoE has the potential to grow global corporate profits by an estimated 21% by 2022</th>
<th>Firms captured just 53% of IoE’s Value at Stake for 2013, leaving $544B of unrealized value</th>
<th>By 2020, there will be approximately 50 billion objects connected to the Internet</th>
<th>In 2012 alone, we created more data than in the previous 5,000 years combined</th>
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It’s the *connections* among people, process, data, and things that create real value from the Internet of Everything.”

– Dave Evans, Chief Futurist, Cisco

| Globally, machine-to-machine IP traffic will grow 20-fold from 2012 to 2017 | By 2014, the number of mobile-connected devices will exceed the number of people on earth | An estimated 77 billion apps will be downloaded during 2014 | 2/3 of the world’s mobile data traffic will be video by 2015 |
BUT – Our World is Mostly Unconnected! Vast Potential for New Insight

1.5T ‘Things’ we could usefully connect

>99% of ‘Things’ remain unconnected

50Bn
The Opportunity is Significant

Value at Stake

$19.0* Trillion

$14.4T
Private Sector
Includes both industry-specific and horizontal use cases.
- Customer Experience: $3.7T
- Innovation: $3.0T
- Employee Productivity: $2.5T
- Supply Chain: $2.7T
- Asset Utilization: $2.5T

$4.6T
Public Sector
Includes cities, agencies, and verticals such as healthcare, education, defense
- Increased Revenue: $125B
- Reduced Cost: $740B
- Employee Productivity: $1.8T
- Connected Defense: $1.5T
- Citizen Experience: $412B

* Estimate is based on bottom-up analysis of 61 use cases, including 21 for private sector and 40 in public sector
### IoE Creating Business Outcomes Across Industries

<table>
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<tr>
<th>Industry</th>
<th>New Connections</th>
<th>Business Capabilities</th>
<th>10-Year Value at Stake</th>
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</table>
| **Manufacturing** | - Converged IP factory network  
- Environmental sensors  
- Product packaging  
- Safety tags and signage  
- Fleet/logistics systems  
- Mobile video devices  
- R&D and production teams | - Remote Asset Monitoring  
- Predictive Maintenance  
- Flexible Production  
- Operations Analytics  
- IT and Physical Security  
- Real-Time Supply Chain  
- Remote Expertise  
- Collaborative Development | $3.9 Trillion |
| **Public Sector** | - Smart buildings  
- Smart lighting  
- Intelligent public transit  
- Smart grid  
- Video surveillance  
- Smart parking  
- Disaster response | - Citizen / Employee Experience  
- Improved Asset Utilization  
- New Revenue Streams  
- Energy Optimization  
- Enhanced Security  
- Increased Compliance  
- Employee Productivity | $4.6 Trillion |
| **Retail**    | - Connected shopping carts  
- Shelf sensors  
- Parking-space sensors  
- Mobile devices  
- Energy meters  
- Video cameras / analytics  
- Immersive video | - Inventory Visibility  
- Flexible Payment Options  
- Energy Optimization  
- Understand Shopper Behavior  
- Endless Aisle Omnichannel  
- Optimized Retail Operations  
- On-Demand Expert Advice | $1.5 Trillion |
Current Situation Creates Opportunity
A Catalyst for Growth Now Slipping Away

**Brand Loyalty in Decline.**
Substantial drop-off, 2006-2010, per Forrester study.

**Probable Culprits:** economy, technology, social media.
Welcome to the “New Normal.” Internet transparency, Gen Y is expected to keep it that way.

**Lifetime value of loyal customer is 10X** that of a shopper who considers the brand a second choice.

"Owning the Best Brand is Important to Me."

Source: Forrester’s NACTAS 2006 Benchmark Survey
Source: North American Technographics Benchmark Survey, Q2 2010 (US, Canada)
Building Trust Through Experiences: From Impersonal to Insightful

1. Impersonal
   - Loyalty Programs
     - Generic. Mass. One size fits all.
   - CRM
     - Database Marketing
       - Past as Predictor

2. Personal
   - Big Data
     - Needles from Haystacks
   - CRM
   - Database Marketing
     - Past as Predictor
   - Single View
     - Data Truth

3. Insightful
   - THE INTIMACY ENGINE
     - Location
     - Right Time
     - Content
     - Context
     - Real-Time Conditions
       - Capture Them
       - Analyze thru Them
       - Respond thru Them

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Big Data is providing these insights – but it’s more than big volume

1.6 trillion gigabytes of information was created and replicated in 2011 (IDC)

NSA builds yottabyte-capable data center (a quadrillion gigabytes)

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Machine-to-machine (M2M) data traffic will increase 22-fold between 2011 and 2016 to reach 508 petabytes per month (Cisco VNI, February 2012)

Video / real time data will be account for most traffic - 100 hours of video uploaded to YouTube every minute

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Unstructured information accounts for more than 70%–80% of all data in organizations (Clarabridge Bridgepoints, 2008)

Internet video will increase fourfold between 2011-2016 to reach 44,247 PB/month (Cisco VNI, May 2012)

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Big Data technology product and services market will grow from $4.8 billion in 2011 to $16.9 billion in 2015 (IDC, 2012)

Source: Cisco IBSG, 2012
Analytics are key

Myriad sources of data: cell phones, social media, equipment, applications...

Too Much data to simply transport everything back to the data center

Consolidate and Integrate data to a manageable set. Transmit summarized data / critical events

Data insights are of little use unless you can effect action – e.g. change digital signage, alert colleagues

Events of Interest occur in real time; it must be analyzed and acted upon in a useful timeframe

Embedded Business Rules can help automate some of the analysis

Source: Cisco IBSG, 2012
Creating Meaningful Customer Experiences in Retail
Retail Challenges

- Items are out of stock or not available on the shelf
- Items are misplaced or shelves and aisles are cluttered and in disarray
- Items are hard to find
- It’s hard to get answers to questions about products
- It’s hard to get good customer service when and where you need it
- Checkout lines are or appear to be long
- Parking is hard to find
Connecting every aspect of the shoppers journey

Capturing Store Insights for Timely Engagement

- Chokepoint / Precision Location
- Digital Signage
- Internet of Things
- Gesture Recognition
- Wi-Fi
- Integrated Video Surveillance
- Associate Tablet
- Customer Mobile

Source: Cisco IBSG, 2012
FastRetailTM Solutions

- FastRetail senses product levels directly, predicting when items should be re-stocked, to maximize availability
- FastRetail senses planogram compliance to improve merchandising
- FastRetail provides precision indoor location, enabling mobile apps or carts to guide shoppers to products of interest
- FastRetail provides assisted as well as self-service based product information
- FastRetail senses shopper needs and more and orchestrates store staff to surprise/delight shoppers in their moments of truth
- FastRetail optimizes checkout and shortens wait times
- FastRetail senses parking lot occupancy and can guide shoppers quickly to available parking
FastRetail™ is centered on improving all aspects of retail

- Build a big data platform with innovative capabilities
- Combine new data streams from sensing activity in-store with existing data streams
- Enable proactive interactions among customers, associates and smart store devices
- Deliver timely, location, and activity aware services
- Increase customer service, sales, and associate productivity
Two initial use cases build Big Data capabilities and drive economic value

- **I. Checkout Optimization**
  - Proactively anticipate checkout traffic and dynamically staff front end resources to reduce customer wait times and increase associate productivity
  - Provide front end managers with proactive (immediate) recommendations to support service levels and repurpose excess labor for other store tasks
  - Provide front end staffing recommendations to optimize local labor planning

- **II. On-Shelf Availability**
  - Proactively anticipate potential out of stocks and dynamically adjust labor to restock and increase on-shelf availability
  - Provide store associates with real time alerts/recommendations for re-stocking
  - Provide merchandise stocking models for localized inventory and labor planning
Creating Meaningful Customer Experiences in the Public Sector
The Public Sector Challenge: Limited Budgets and …

“Australia’s opposition … plans to cut spending on foreign aid and axe public sector jobs to help pay for new roads …”

“Greece’s parliament has approved … public sector cuts that will see thousands of people lose their jobs.”

“Local government will take the biggest hit, with cuts of 10%. (U.K.)”

“The sequester lowers spending by approximately $1.1 trillion … and lowers non-defense discretionary spending by [up to] 7.8%. (U.S.)”

“The primary driver of the projected expenditure increase is an ageing population … adding urgency to the need to look anew at plans for public service delivery…. (Australia)
... Rising Citizen Expectations

“Citizens tend to expect increasingly better and faster service from the public sector, even as governments struggle to maintain basic levels of service .... (Canada)”

U.K. Government Performance vs. Citizen Expectations

- Citizen Input
- Evidence of Actual Results
- Effective Remedial Action
- Explain Spending Priorities

- Citizen Empowerment
- Easy Access to Information
- Reliable Information
- Collaboration with Citizens

- Right Societal Issues
- Effective Internal Collaboration
- Right Citizens Helped
- Effective External Collaboration

- Fair & Equal Access
- Omnichannel Access
- Easy Access to Services for All
- Tailored Services

Source: Accenture, 2012
Public Sector Companies Have Many Areas of Opportunity: Productivity, Costs, Revenue, Experiences

- Executive Leads
  - Knowledge worker productivity
  - Data integrity
  - Joined up government
  - Employee expectations
  - Privacy

- State/Local/City
  - Workplace conditions
  - Traffic congestion
  - Recreation area management
  - Environmental impact
  - Citizen experience

- Healthcare
  - Effective use of technology
  - Meeting regulatory requirements
  - Hospital stays and readmissions
  - Drug compliance
  - Nursing costs

- Defense
  - Minimizing combat casualties
  - Cyber Security
  - Shift from State to non-State actors
  - Procurement and provisioning
  - Logistics
  - Soldier care

- Education
  - Maximize technology for next-generation learning
  - Rising costs
  - Attract and retain quality students
  - Scale globally
  - Competition from traditional, international, new model
Technology Is Providing New Opportunities To Address These Challenges

Example: Smart Parking

New Things Connected
- Parking spaces
- Parking meters

New Data Flows
- Space availability

Process Innovation
- Pricing
- Payment
- Enforcement
- Finding spaces

People Impact
- Traffic wardens
- Citizens/drivers
- City planners

Value Impact
- Increase compliance by 30%
- City data sales
- Reduced congestion, time-to-park
- Dynamic pricing – revenue increase

Example: City of Nice’s Connected Boulevard — Internet of Everything
IoE Transformation Is Maximized When Cities Combine Use Cases

- **Parking**
  - Increased compliance
  - Reduced search times

- **Lighting**
  - OpEx reductions
  - Crime reductions

- **Road Pricing**
  - Improved traffic flow
  - City revenue

- **Particulate Monitoring**
  - Improved health
  - Improved compliance to standards

- **Buses (Bus Stops)**
  - Reduced wait times
  - Higher occupancy

- **Toll Booths**
  - Faster processing times
  - Reduced traffic congestion

- **Waste Management**
  - OpEx reductions
  - Usage-based pricing

For Cities (Ruggedized Wi-Fi Network)
Smart and Connected Cities: Barcelona

The city of Barcelona installed ‘smart’ street lighting that counts people, measures pollution and monitors parking spaces – as well as connected trash cans, and much more

Citizen Impact

- Residents and visitors are directed to available parking spaces
- Trash is picked up only when needed
- Save $58 million in water usage and $37 million in reduced lighting costs
- Drove $50 million increased revenue from parking fees
Smart Parking
$267M Value at Stake

New Things Connected
- Parking spaces
- Parking meters

New Data Flows
- Space availability

Process Innovation
- Pricing, payment
- Enforcement
- Finding spaces

People Impact
- Traffic wardens
- Citizens / drivers
- City planners

Citizen Impact
- Reduced search time for parking spaces decreases frustration
- Pricing based on better supply / demand balance increases citizen satisfaction
- Reduced chance of parking infringements as compliance improves relationship between citizens and cities
Smart Street Lighting
$369M Value at Stake

**New Things Connected**
- Street lighting points

**New Data Flows**
- Light intensity

**Process Innovation**
- Controlling street lighting points

**People Impact**
- Citizens
- City planners

**Citizen Impact**
- Better lighting increases feeling of safety and security, increases property values
- Better visitor experience from iconic lighting increases citizen loyalty and pride in their city
- More availability of Wi-Fi based services increases citizen productivity
Public Transportation
$145M Value at Stake

**New Things Connected**
- Buses and trams
- Bus stops
- Payment system

**New Data Flows**
- Bus / tram arrival information
- Digital advertisements

**Process Innovation**
- Bus / tram scheduling
- Waiting time

**People Impact**
- Citizens
- City planners

**Citizen Impact**
- Real-time information on bus arrivals increases rider satisfaction
- Faster payments leads to reduced trip times
- Segmented digital advertising of relevant products and services improves rider experience
- Improved scheduling from passenger statistics reduces rider frustration
Implementing an IoT for the Public Sector in Australia could generate an estimated $25.9B of value

- Citizen $3.7B
  - Chronic disease
  - Counterfeit drugs
  - Telework
  - Payments
  - Drug Compliance

- City $22.2B
  - Cyber Security
  - Chronic disease
  - Smart Grid
  - Mobile Collaboration
  - Travel avoidance

$4.6T $25.9B
How To Take Advantage of the IoE Opportunity
IoE Demands Innovation
Which Requires Collaboration

INTERNET of EVERYTHING

ECONOMICS of IoE

BIG DATA

ANALYTICS

INNOVATION

SECURE COLLABORATIVE PLATFORM

$19 Trillion

50,000,000,000,000
Collaboration Benefits: A Foundational Platform for Innovation – and Funding Mechanism for IoE

The Key Drivers of Cisco Collaboration Value

- **Reduce costs to improve profitability**
  - Avoid travel
  - Reduce real estate
  - Reduce support costs
  - **$959M**

- **Save time to increase efficiency**
  - Reduce travel downtime
  - Reduce commuting
  - Find people faster
  - Find information faster
  - **$1,107M**

- **Transform business to increase growth**
  - Scale expertise
  - Increase customer intimacy
  - Enhance executive communication
  - Create new revenue streams
  - **$82M**

- **Speed process to increase agility**
  - Shorten sales cycle
  - Speed time to market
  - Reduce delays in decision making
  - **$662M**

Cisco FY2012 Benefits (Gross) = $2,811M

Source: Cisco IBSG, 2013
How Cisco is Helping our customers Capture IoE Benefits

**Executive Exchange**
- Find and refine customer priorities
- High level hypothesis
- Industry use case(s)

**Value Assessment**
- Analyze current practices
- Prepare gap analysis
- Quantify value at stake

**Strategy & Plan**
- Develop strategy and business case
- Build roadmap, plans and designs
- Use case pilot(s)

**Build & Manage**
- Advanced Services
- Technical Services
- Managed and Operate Services
The Call to Action

• Determine where your business is today with regard to IoE – What’s connected, what’s not?

• Where are your biggest challenges / opportunities (efficiency, customer experience, innovation...)

• What new ‘Things’ are / will be connected in your industry

• How could you leverage Big Data more effectively

• Evaluate your ability to collaborate effectively and efficiently across the company (how much could you save, to invest in IoE)

• Engage Cisco to conduct an “Executive Exchange”
Thank you.