Top 10 Strategic Technology Trends for 2015

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Digital Business Sets the Stage

Business Process

Improve process efficiency/effectiveness with mobility

| New models and processes | Extend and evolve processes |

Business Moment

| Evolve processes into new business models | Extend and evolve models |

Business Model

JustPark • UBER

Implement new business models relying on mobility

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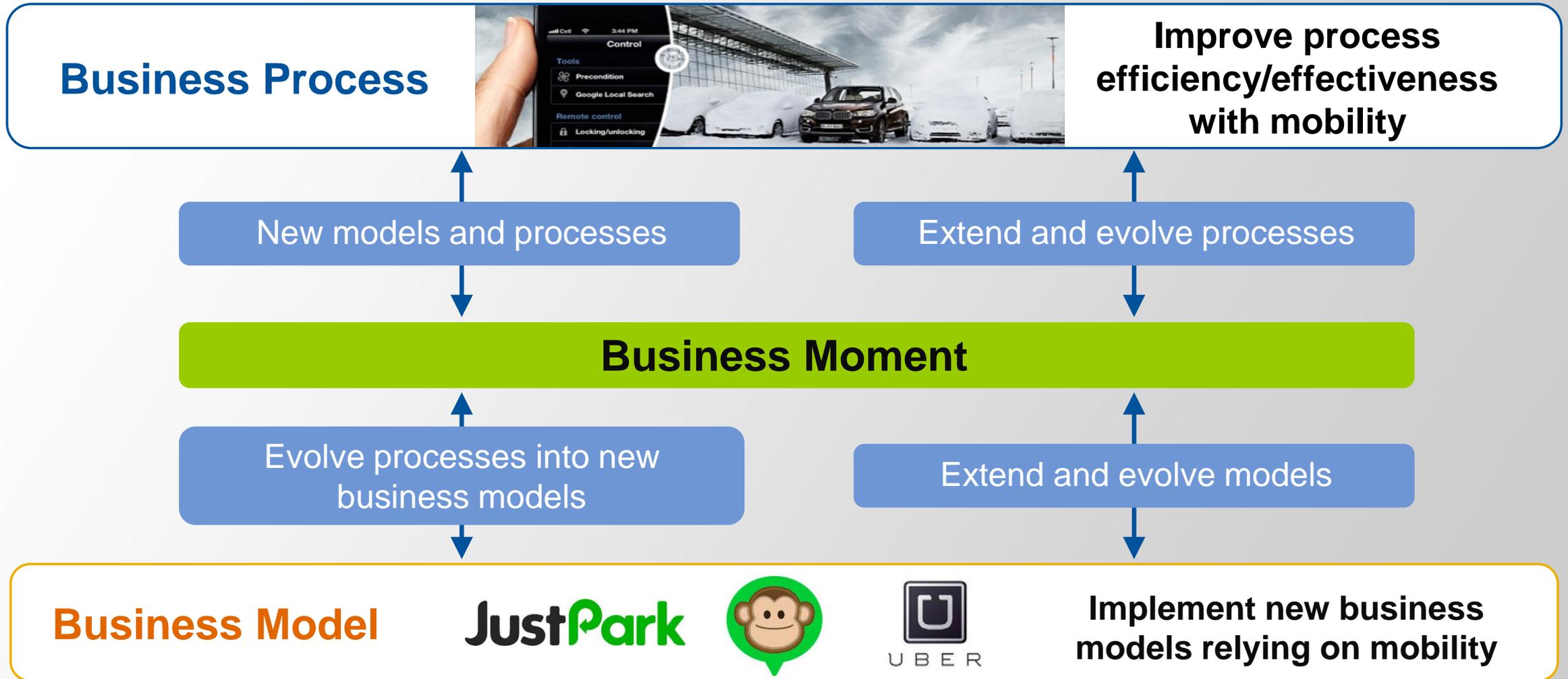
Top 10 Strategic Technology Trends for 2015

Merging the Real World and the Virtual World

1	Computing Everywhere
2	The Internet of Things
3	3D Printing

Intelligence Everywhere

4	Advanced, Pervasive and Invisible Analytics
5	Context-Rich Systems
6	Smart Machines

The New IT Reality Emerges

7	Cloud/Client Computing
8	Software-Defined Applications and Infrastructure
9	Web-Scale IT
10	Risk-Based Security and Self-protection

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Computing Everywhere —
Look Beyond Mobile Form Factors

- Many form factors, screen sizes, interaction styles, platforms, architectures

- Technology advances accelerate: Sensors, displays, wireless and more

- Embrace heterogeneity and loss of complete control

- Use containment and isolation as a foundational security strategy
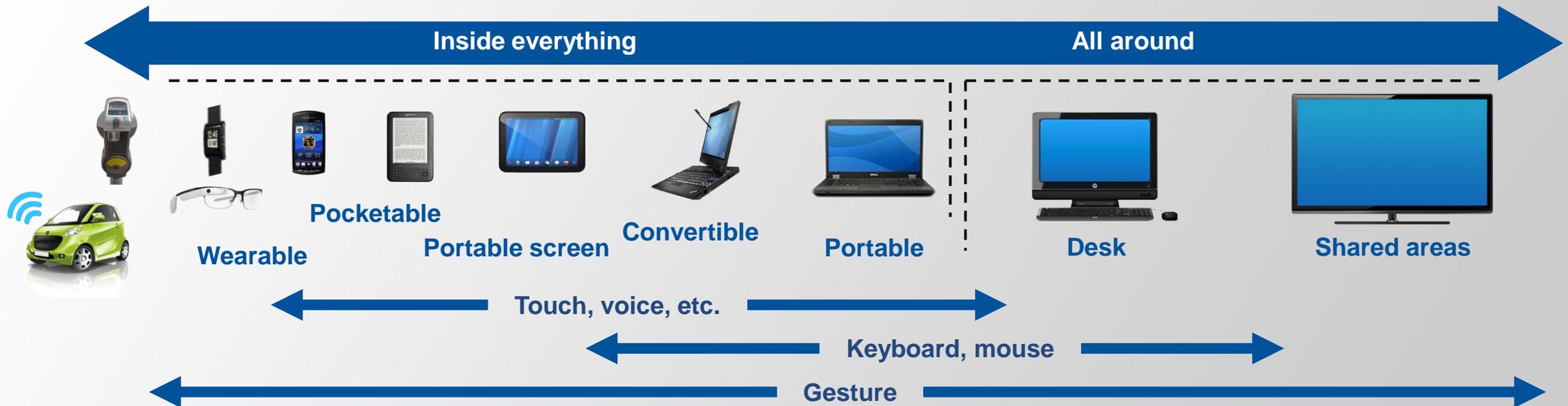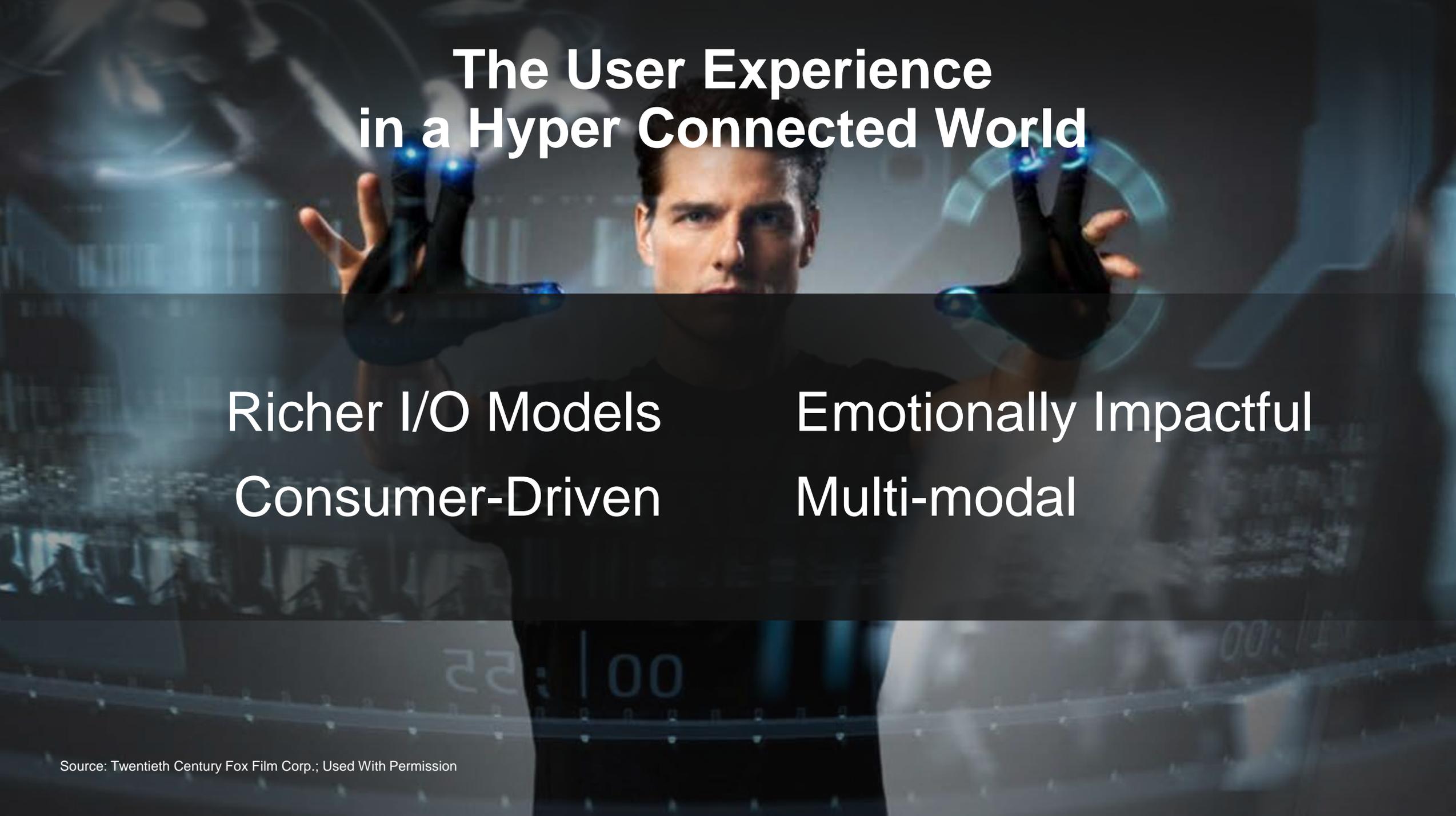
Inside everything   All around

Wearable   Pocketable   Portable screen   Convertible   Portable   Desk   Shared areas

Touch, voice, etc.

Keyboard, mouse

Gesture

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The User Experience in a Hyper Connected World

Richer I/O Models

Emotionally Impactful

Consumer-Driven

Multi-modal

Source: Twentieth Century Fox Film Corp.; Used With Permission

The Internet of Things Links to Everything

Internet of People
1.11B People on Facebook, March 2013

Internet of Information
30T Web Pages in Google Index, 2013

Manage

Monetize

Operate

Extend

Internet of Things
25B Things by 2020

Internet of Places
3B Foursquare Check-Ins, January 2013

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Identify New Patterns and Define New Technical Architectures for the Internet of Things

Thing

Gateway

Cloud/"Internet"

Enterprise/ On-Premises

User Interface

Application Logic and Rules

Data

Analytics

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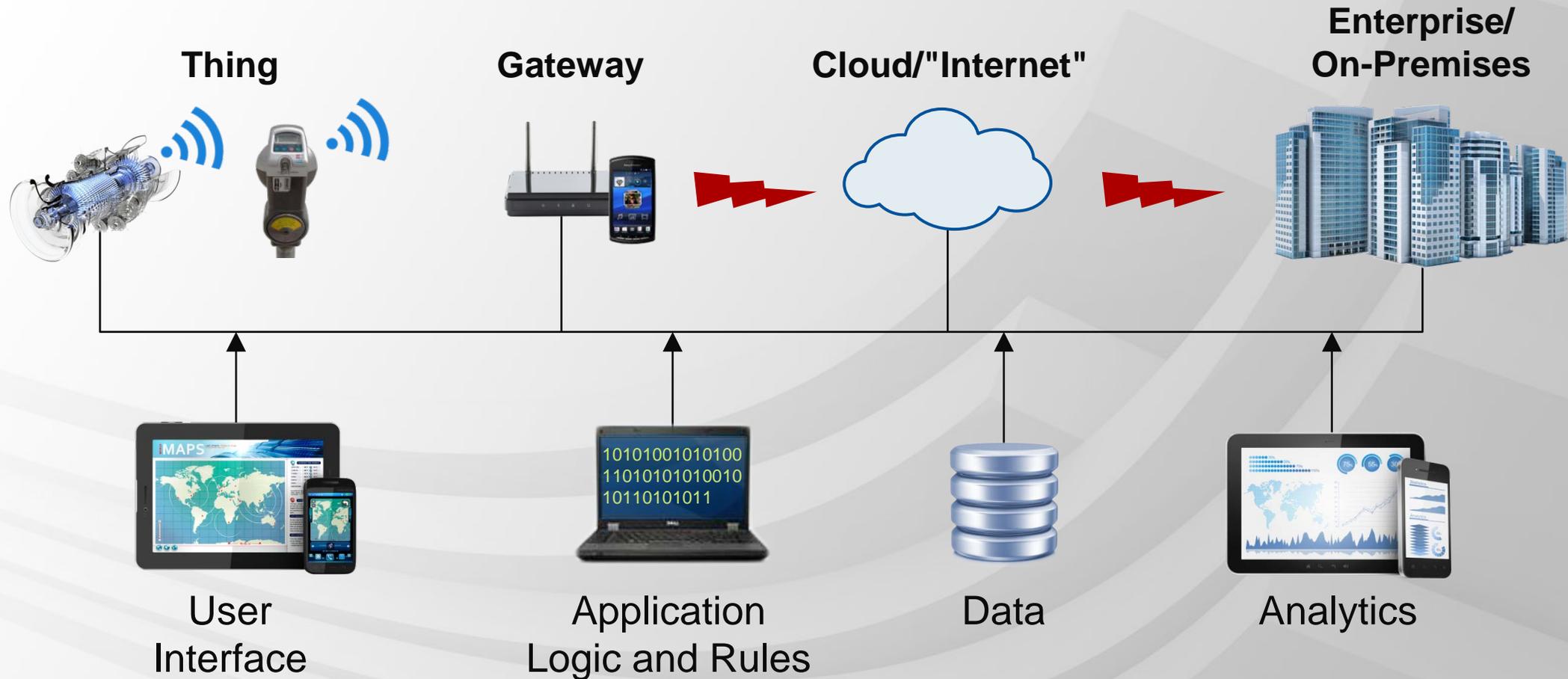
# Experiment!
A $75 Proof of Concept …
Can Save $75,000

"Customer down, magnet down, $75,000 magnet recovery problem to retool the magnet.

These have really worked well monitoring our magnets at our office in Ohio."

… and embrace the "maker culture."

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3D Printing — An Emerging, Growth and Mature Technology

expectations

Consumer 3D Printing

3D Bioprinting Systems

Enterprise 3D Printing

As of July 2014

| Innovation Trigger | Peak of Inflated Expectations | Trough of Disillusionment | Slope of Enlightenment | Plateau of Productivity |

time
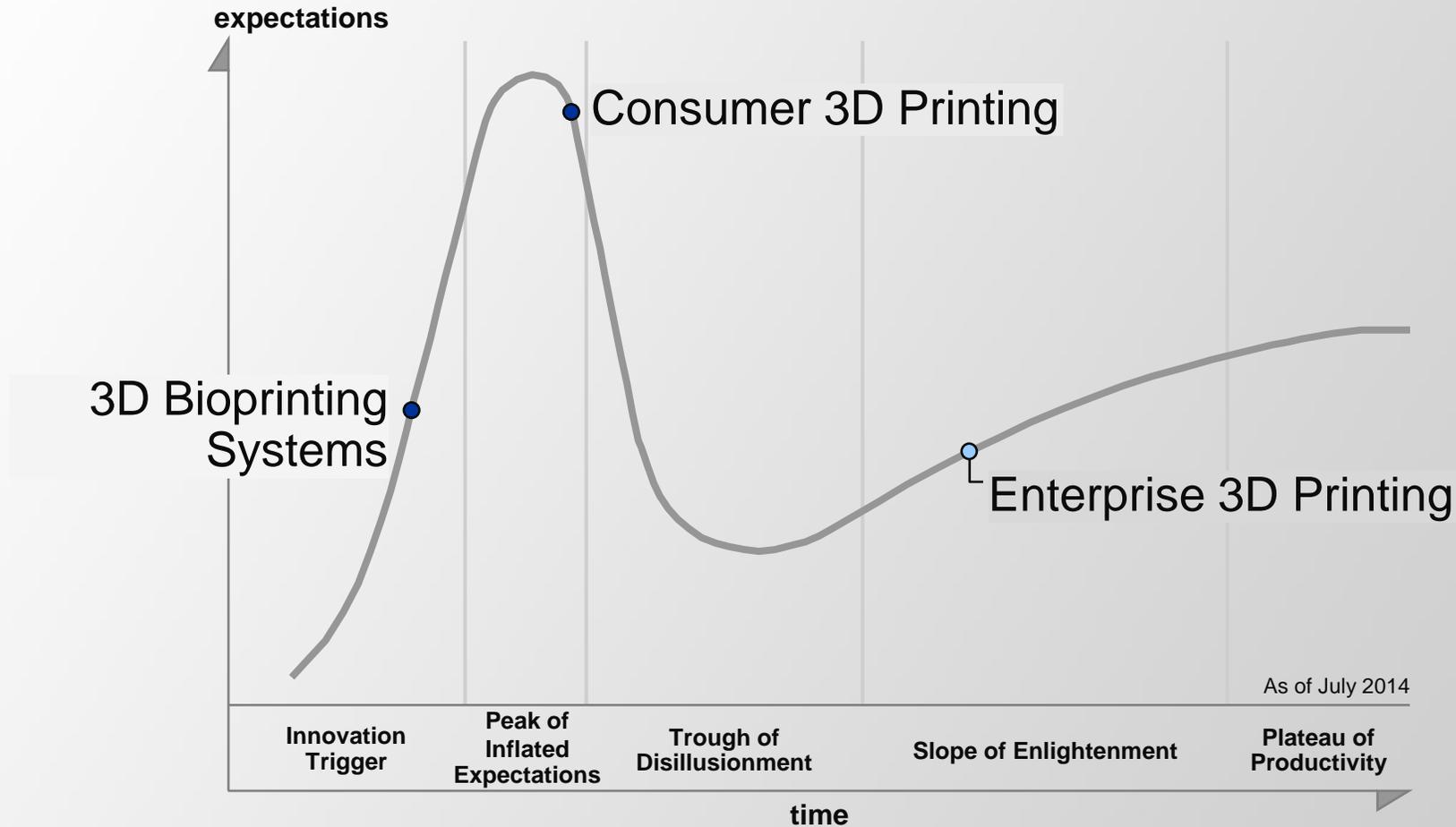
From "Hype Cycle for 3D Printing, 2014"
21 July 2014, (G00263487)

Plateau will be reached in:

○ less than 2 years   ○ 2 to 5 years   ● 5 to 10 years   △ more than 10 years   ⊗ obsolete before plateau

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# … but Is Newly Strategic Reaching an Inflection Point for the Enterprise Market

Billions of Dollars

81.9%
CAGR

■ Enterprise ■ Consumer

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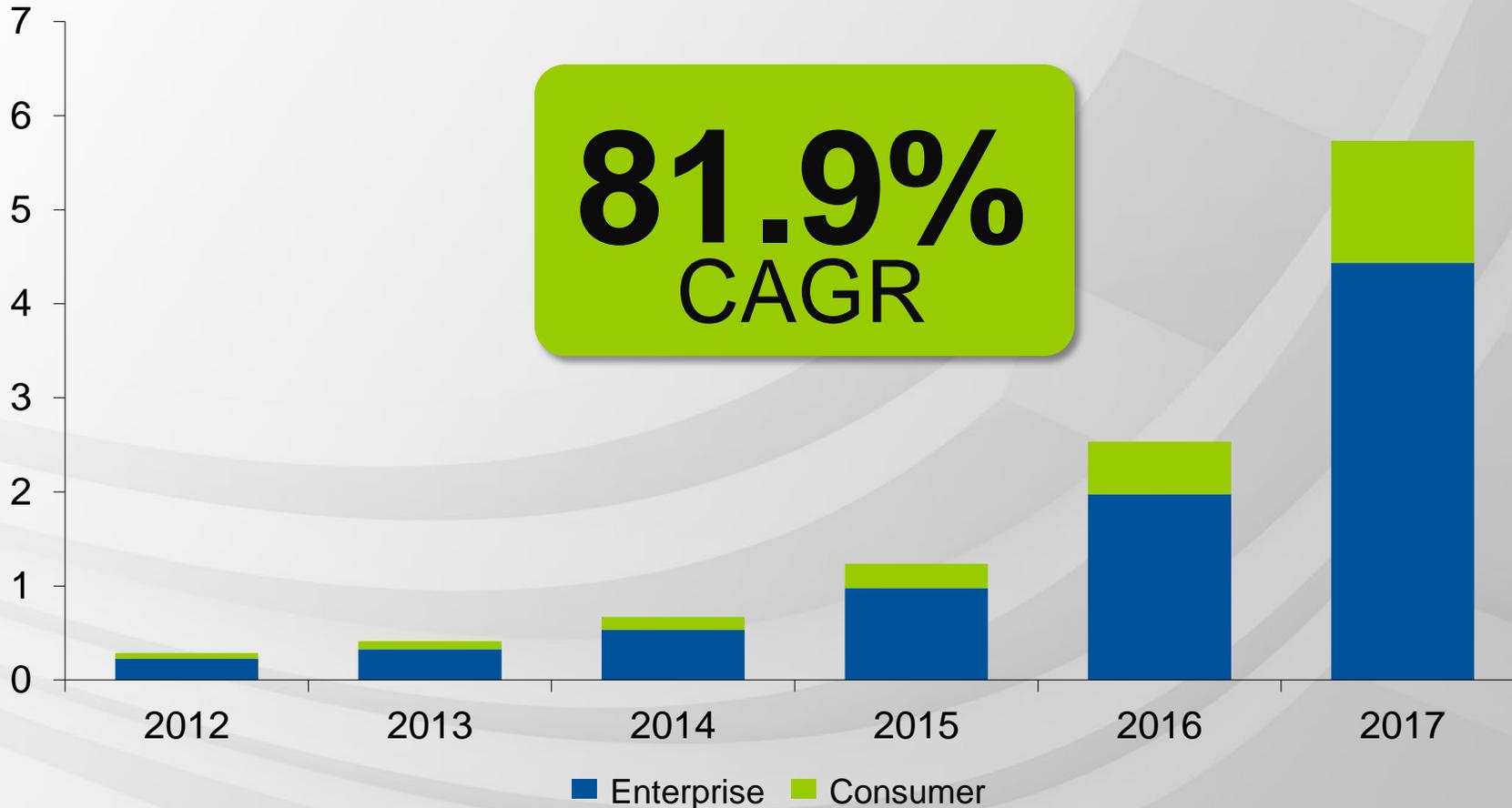
Consumer Shipments Point to More Pervasive Use

Shipments

95.4% CAGR

- Enterprise
- Consumer

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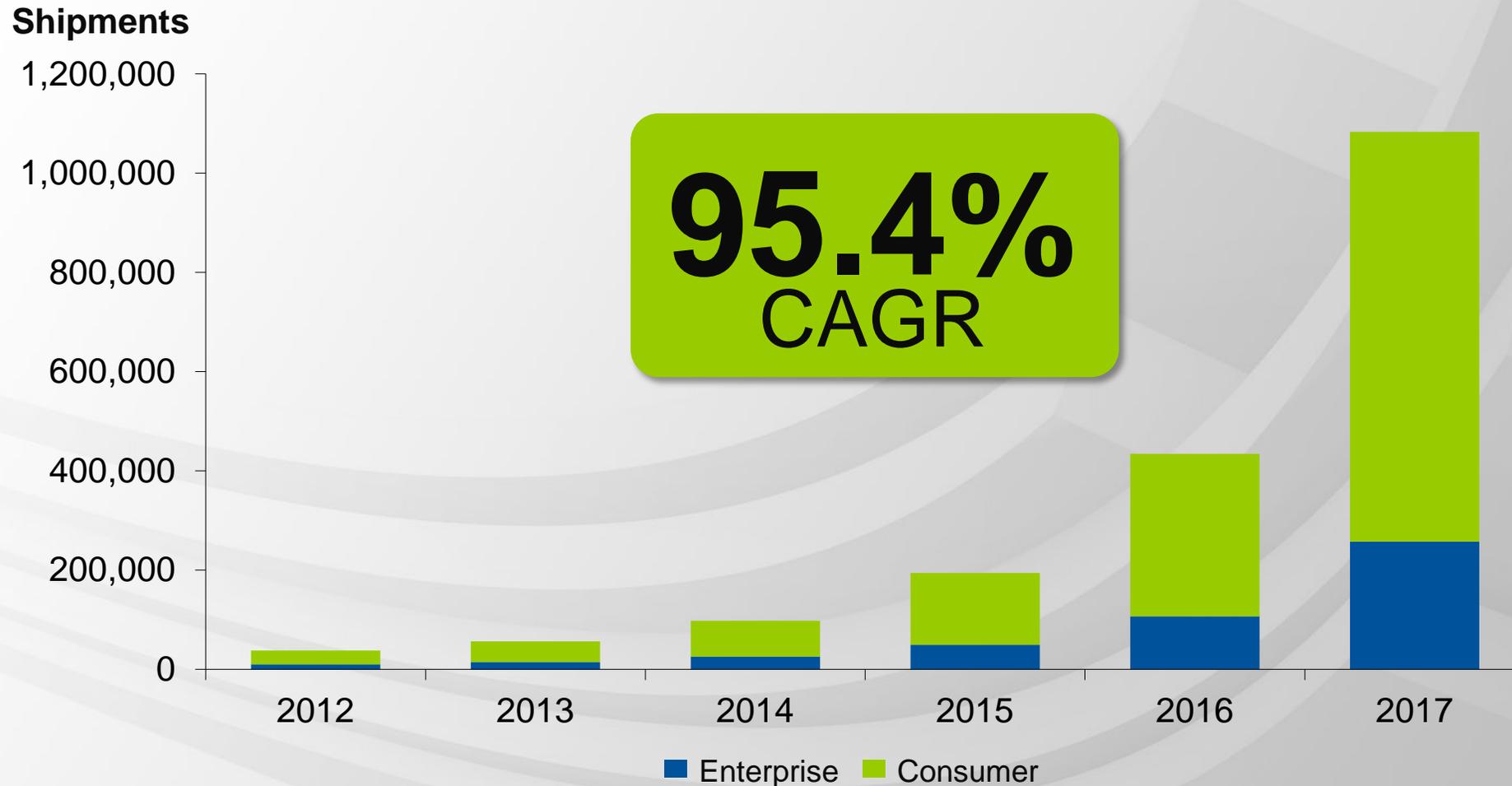
Analytics — Advanced, Pervasive and Invisible Big Data Security Analytics

Context-Aware Intelligence

Continuous Monitoring and Analytics

Model, Simulate, Act, Protect

Community → ← Context

Knowledge

Patterns, Meaningful Anomalies

Analyze

Information

Dependencies, Relationships

Collect, Correlate

Big Data

Data | Data | Data | Data

Logs, Events, Costs, Usage, Attacks, Breaches

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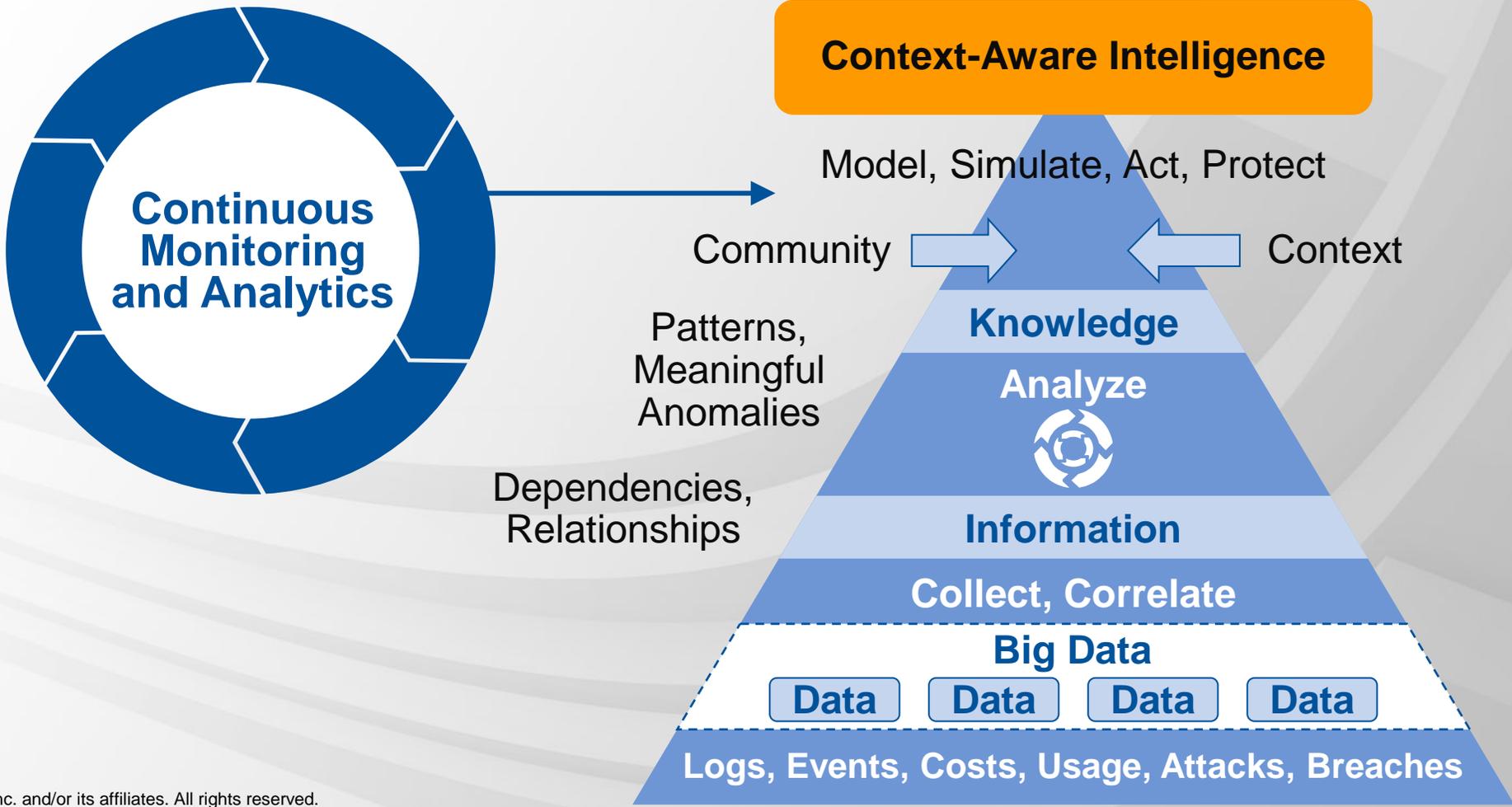
Data Lake …   … or Reservoir?

Unmanaged	Managed
Original	Transformed
Raw	Filtered
Natural Security	Secured (Somewhat)
Not Portable	Portable
Consumption Fitness Uncertain	Potable (Fit for Consumption)

Context-Rich Systems Understand Who, What, When, Where, How and Why

User-Facing Context

Identity and Pref.	Environment
Calendar	Community
Connectivity	Location
Process Models	Content Sources
History	Patterns
Etc.	

System-Facing Context

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Real-Time, Context-Aware, Risk-Aware and Active: Adaptive Access Control

Contextual information.

Risk engine.

Get more information!

Allow access.

STOP Deny access.

Allow access with fine-grained audit.

Other obligation.

Step-up authentication.

Trust elevation.

Transaction verification.

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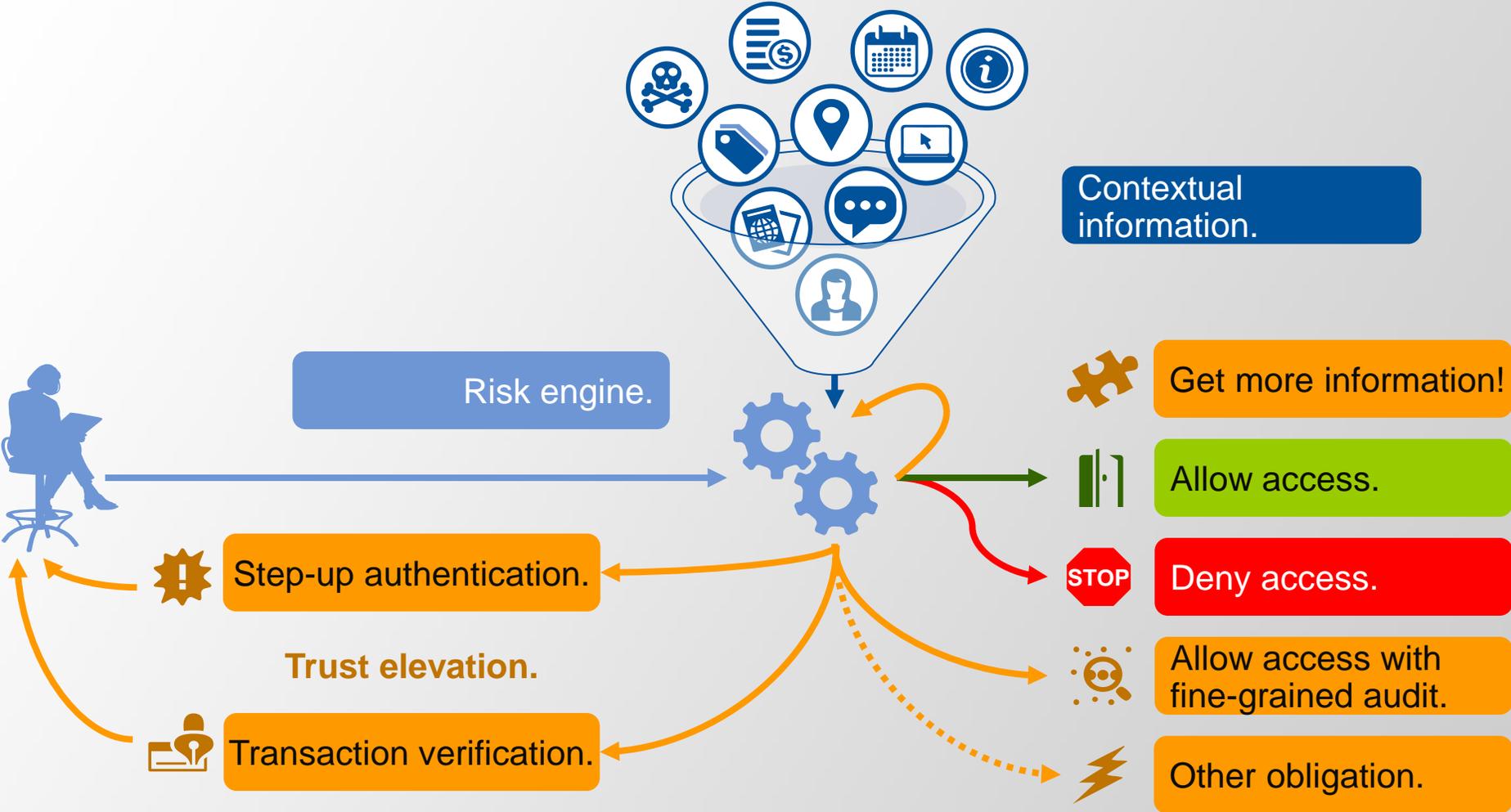
Smart Machine Categories Based on What They Do

Movers	Autonomous Vehicles
Sages	Information-Based Helpers
Doers	Machine-Focused Helpers

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Rio Tinto —
Reinventing Mining … and More

Cornell's Observant, Predictive Servant

Virtual Private Assistants — You Will Not Have Just One

Contextual Information:

- Location Information
- Available Endpoints
- Human Request for Action
- Relevant Services and Content

User Experience Platform:

- Intermediary Between Users and Content/Capabilities
- Acts for or Interacts With the User to Accomplish Goals:
  - The Invisible User Interface
- Dynamically Assembles UI Screens/Forms

## Personal Assistants as Intermediaries

Image © Apple

Siri
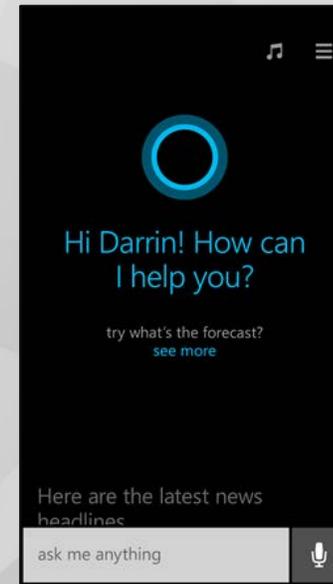
Image © Microsoft

Cortana
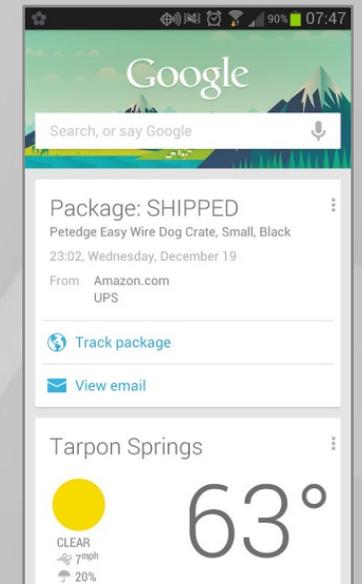
Image © Google

Google Now

… Just the Beginning!

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Unify Cloud and Mobile Strategies: Cloud/Client Computing
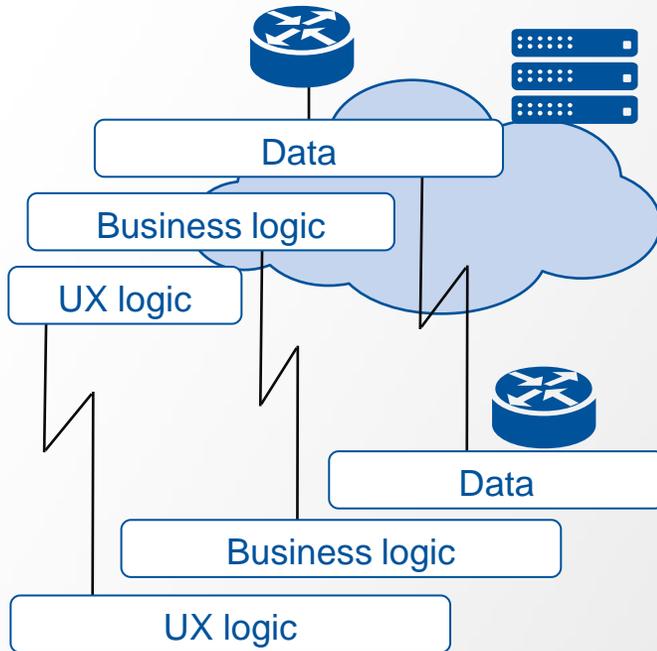
- The application is in the cloud.

- Cloud is the coordination point and system of record.

- Clients can be anything with varying levels of data and logic.

- Applications can span multiple clients.

- Multichannel, Multi-scn., ensemble interactions.

- The experience flows to the user in context.

- Mobile is not about devices … it is about people.

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Shift From Application Migration, to the Cloud, To Cloud "Native" Application Development

Conventional Pattern	Cloud "Native" Pattern
Central SQL Database	Distributed Key/Value NoSQL
Sticky In-Memory Session	Shared Memcached/Redis Session
Chatty Protocols	Latency Tolerant Protocols
Tangled Service Interfaces	Layered Service Interfaces
Polled Information	Event-Driven
Fat Complex Objects	Lightweight Serializable Objects
Components as Jar Files	Components as Services
Java, .NET	JavaScript, Python, Ruby, Node.js

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Software-Defined Applications and Infrastructure: The Future Is Software-Defined

Networking

Storage

Security

Data Centers

OpenStack
Open Compute

**Everything
Is Programmable**

The API Economy

Cloud Services

Real-Time
Infrastructure

Fabric-Based
Computing

Service-Oriented
Architecture

Model-Driven
Architecture

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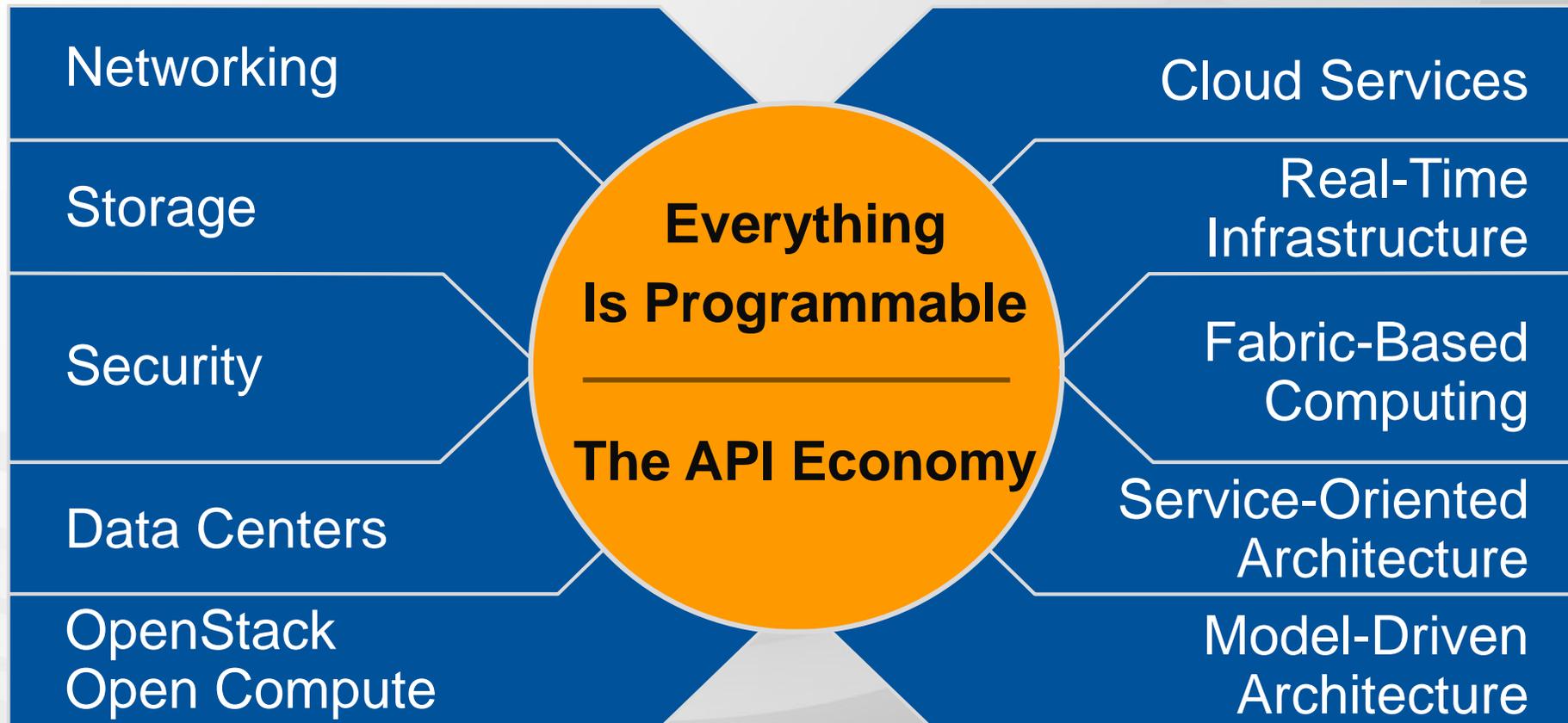
Software-Defined Architecture for Application Services

Outer Application Plane

Digital World
(Apps, Things, Services)

Outer View

Outer APIs

Resource Virtualization

Intermediary Control Plane

Service Virtualization Gateway

Inner View

Inner APIs

Managed Resources

Inner Physical Plane

Application Plane
(Services, Compositions)

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Web-Scale IT:
The Foundation for the Digital Future

Web-scale IT is a pattern of global class computing that delivers the capabilities of large cloud services providers to the enterprise

Open

Industrially Designed Data Centers

Risk-Embracing Culture

Web-Oriented Architecture

Web-Scale IT

Collaborative Aligned Organization

Infrastructure as Code

Velocity-Focused Processes

Source

facebook

amazon web services™

Google

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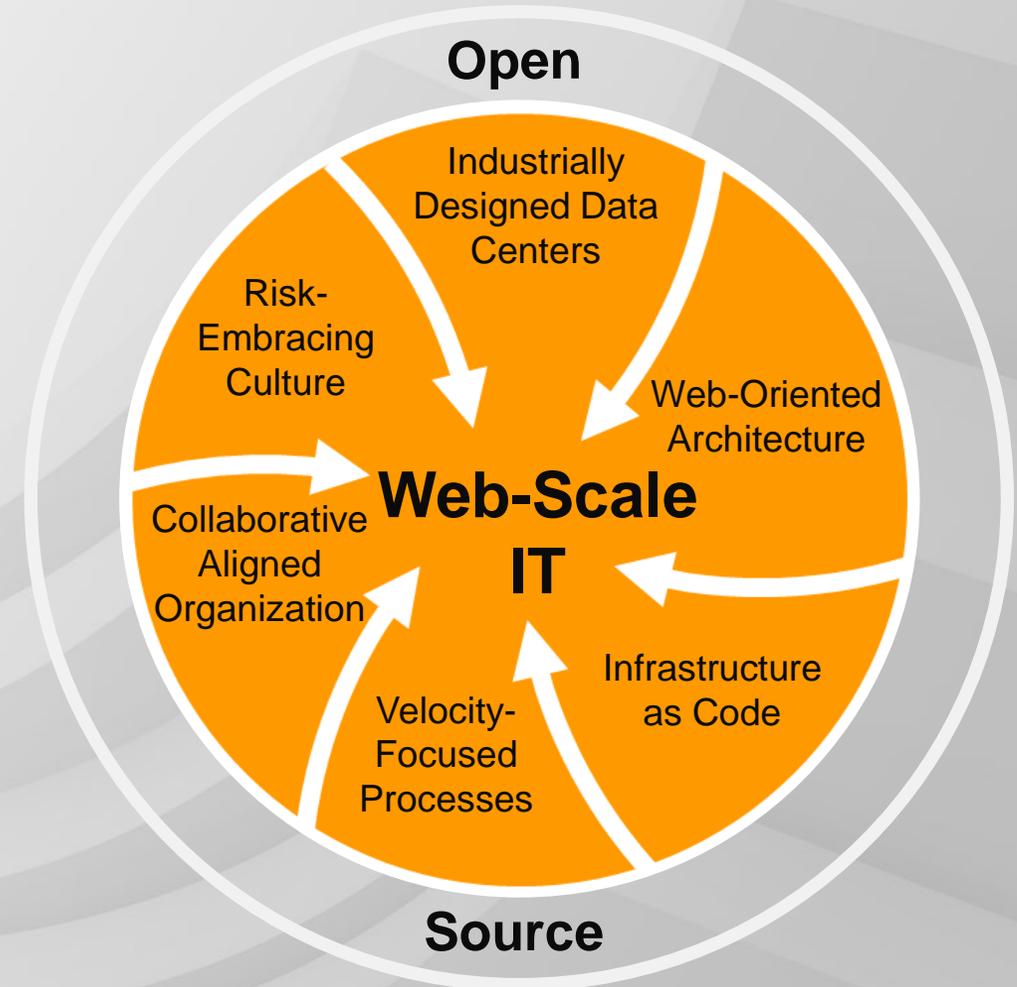
Create Your Blueprint and Road Map for Web-Scale IT

1

DevOps

API-Based Management

Velocity-Focused Processes

Collaboratively-Aligned Organization

Risk-Embracing Culture

2

Web-Oriented Architecture

3

Industrially Designed Infrastructure

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Security Myth:
Perimeter Defense Will Protect My Applications

Mobile

Internet of Things

Insider Attacks
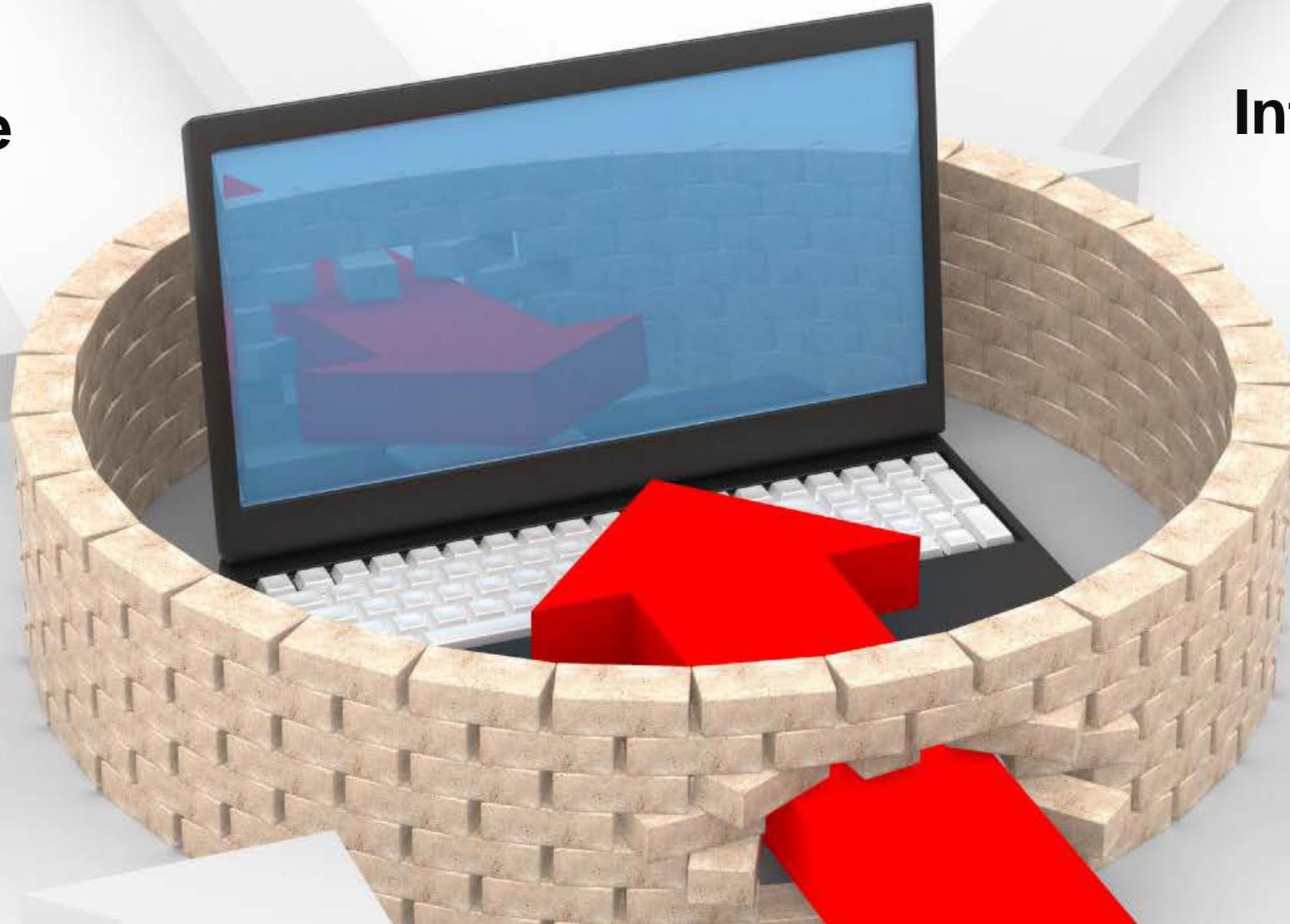
Enable Applications to Protect Themselves

Application Runtime

Dynamic Interaction

Application Source Code

Output:

High-Assurance Security Vulnerabilities

Security-Aware Application Design

Runtime Application Self-Protection

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ICT Strategic Technology Trends for 2015

Merging the Real World and the Virtual World	✓ Proactively analyze disruptive technology trends and create a vision of the future technology landscape
Intelligence Everywhere	✓ Link trend analysis to the impact on people (employees and customers), the business and IT
	✓ Establish strategic decision models to take action on disruptive impacts
The New IT Reality Emerges	✓ Focus on the EA role as a visionary, an analyst and a catalyst for disruptive trend analysis across IT and the business

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